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The Duke Institute for Brain Sciences (DIBS) brings together scholars—from undergraduates to senior faculty—who are passionate about brain science and its potential for transforming health and society. The brain is the most complex organ of the human body, allowing us to perform a wide range of activities, from basic functions such as breathing to complex functions such as scientific exploration. Our brain is the only organ that can contemplate itself. Fortunately, due to rapid advances in technology, our progress in understanding the brain and how it develops and functions is growing at a truly remarkable pace. Every day, new techniques are being developed that allow us to peer inside the inner workings of the brain and envision entirely new solutions to brain diseases and dysfunction that have prevented people from leading full and productive lives. Duke neuroscientists are tackling some of the most significant public health challenges, such as addiction, autism, Alzheimer’s disease, epilepsy, and blindness, to name a few. Other scientists are discovering how decisions are made, how we perceive beauty and art, and the one organ that can contemplate itself. Fortunately, by teaching the public about the importance of brain sciences at Duke. DIBS is at the forefront in the field of brain sciences. DIBS is committed to translating neuroscience in ways that have real impact on our local community and society at large. Duke is at the forefront in the field of brain sciences.

Duke Institute for Brain Sciences FY17 Annual Report

Executive Summary

Duke is at the forefront in the field of brain sciences. DIBS plays an essential role in Duke’s success by promoting interdisciplinary neuroscience. DIBS plays an essential role in Duke’s success by promoting interdisciplinary neuroscience. We do this by bringing together students and faculty from disciplines that span the entire university, facilitating their collaboration through seminars, workgroups, and Centers, and providing seed funding for novel ideas. One hundred seventy faculty members are part of the DIBS Faculty Network, representing the Schools of Medicine and Nursing, Trinity College of Arts and Sciences, Pratt School of Engineering, Fuqua School of Business, Sanford School of Public Policy, and the School of Law. This past year, DIBS provided $525,000 in seed research funding, supporting 11 high-risk, high-impact research DIBS Incubator Awards that involved 38 faculty investigators and numerous students from across Duke’s campus. These innovative projects addressed topics ranging from chronic back pain to smoking cessation to Huntington’s disease. Duke is also at the forefront in educating our undergraduate and graduate students about the brain sciences. DIBS and the collaborating departments of Psychology & Neuroscience and Neurobiology are experimenting with new ways of engaging students in the field of neuroscience and teaching students about the brain. Over 300 undergraduate students participated in DIBS’ gateway neuroscience course. We were proud that over 40% of neuroscience major graduates this past year did so with “distinction in neuroscience,” with the majority entering medicine, neuroscience research, or technology fields after graduation. At the graduate level, DIBS is actively engaged in nurturing and teaching doctoral students in psychology, cognitive neuroscience, neurobiology, biomedical engineering, and medicine. This takes place both informally through social events and career development workshops, as well as formally through didactic and laboratory courses offered to graduate students, medical students, and medical residents. Expanding our reach to 52,000 individuals, Dr. Len White taught “medical neuroscience” online, a course rated as one of the top “massive open online courses (MOOCs) of all time” by Class Central. Our impact is significantly increased through philanthropic gifts. Several donors gave generously to support new research and education initiatives, including support for research on translational neuroscience, autism, and Alzheimer’s disease. The ongoing support from Anne and Robert Bass plays a key role in DIBS Bass Connections in Brain & Society, which engages undergraduates, graduate students, postdoctoral fellows, and faculty from different disciplines in an immersive curriculum that combines research and coursework and culminates in a multidisciplinary, team-based project. Nine Bass Connections in Brain & Society teams, involving 33 faculty members and 59 students, explored a wide range of topics that spanned from improving neurosurgery outcomes in Uganda to assessing mild traumatic brain injury in children to understanding how we perceive beauty and art. DIBS is committed to translating neuroscience in ways that have real impact on our local community and society at large. We extended our reach beyond Duke by teaching the public about the importance of brain health. This year, DIBS provided science days for the public, and our faculty spoke at forums such as the public library, community colleges, and elementary schools. We also offered community workshops and events, such as a workshop on fetal alcohol syndrome for teachers and an autism awareness event for parents and professionals. A terrific example of how science can ultimately impact society is illustrated by the partnership that was formed between Duke neuroscientists studying opiate addiction and the Sanford School of Public Policy, with a goal of educating legislators about efforts that could help stem the opioid epidemic in North Carolina.

Finally, the last part of this year was marked by a transition to a new form of leadership and governance at DIBS. DIBS is now led by a Faculty Governance Committee representing faculty members from Arts and Sciences, Engineering, Kenan Institute of Ethics, and the School of Medicine. A new Chief Operating Officer was hired to lead the operational aspects of DIBS. A key purpose of this new structure is to promote deeper engagement of the faculty, graduate students, and postdoctoral scholars at Duke in setting the priorities for DIBS. We look forward to seeing the impact of this new governance structure, which will involve setting future strategic priorities with input from the broad community of individuals who are passionate about brain sciences at Duke.

Highlights of DIBS Accomplishments During FY17

• Funded 11 interdisciplinary DIBS Research Incubator Awards to support novel high-risk, high-impact brain sciences research
• Recruited new assistant professor Gregory Samanez-Larkin with the Department of Psychology & Neuroscience, who brings expertise in the areas of emotion, behavioral economics, and motivation
• Provided a nurturing educational environment for 205+ declared majors and minors in the thriving undergraduate neuroscience program
• 35 peer-reviewed publications were co-authored by Duke undergraduate neuroscience majors, many in high-impact journals such as Nature Neuroscience, Neuron, Journal of Neuroscience, and PLoS ONE.
• 5 students in the Cognitive Neuroscience Admitting Program defended their doctoral dissertations, moving to the next stage in their careers in medicine and neuroscience.
• Expanded the DIBS External Advisory Board to help with DIBS development and organizational advancement. The board is made up of alumni, parents, external corporate and industrial professionals, and potential donors.
• Thanks to a generous $910K gift from the Karen L. Wrenn Trust, we inaugurated two graduate travel fellowships, a lectureship, and a 3-year-long graduate fellowship to support Alzheimer’s Disease research.
DIBS Research and Faculty

The Scholarly Impact of DIBS – by the numbers

<table>
<thead>
<tr>
<th>170 DIBS Faculty Network Members, from 7 different schools across the university, by primary affiliation</th>
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<tbody>
<tr>
<td>23% Trinity College of Arts &amp; Sciences</td>
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<tr>
<td>59% School of Medicine</td>
</tr>
<tr>
<td>7% Pratt School of Engineering</td>
</tr>
<tr>
<td>7% Fuqua School of Business, School of Nursing, Sanford School of Public Policy, School of Law</td>
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New faculty member (Gregory Samanes-Larkin) was hired jointly by DIBS and the department of Psychology & Neuroscience

New Professors of the Practice (Minna Ng and Nicole Schramm-Sapyta) hired to support the neuroscience major and co-curricular programs

New regular-rank, non-tenure track faculty hired since DIBS inception

$525K Funding support for 2016-2017 DIBS Research Incubator Awards
- 11 Incubator Award research projects funded in FY17
- 38 faculty co-investigators supported (74% SoM; 16% Trinity; 10% Pratt)

$6.1M Total new external grant award funding (directs and indirects) from FY17 proposals from DIBS grant efforts (See Appendix 1)

Interdisciplinary Centers supported
- Center for Cognitive Neuroscience
- Center on Addiction and Behavior Change at Duke
- Duke Center for Autism and Brain Development
- Duke Center for Interdisciplinary Decision Science

The Nature of Disgust: An Interdisciplinary Inquiry
Investigators: Kevin LaBar (Psychology & Neuroscience), Walter Sinnott-Armstrong (Philosophy), Nancy Zucker (Psychiatry & Behavioral Sciences)
This study explored the neurobiological mechanisms responsible for disgust with an eye toward developing treatment programs for eating disorders.

DIBS Research Incubator Awards Program

Repeated Transcranial Magnetic Stimulation (rTMS) Modulation of Insula-based Functional Connectivity
Investigators: Merideth Addicott (Psychiatry & Behavioral Sciences), Greg Appelbaum (Psychiatry & Behavioral Sciences), Timothy Strauman (Psychology & Neuroscience), Bruce Luber (Psychiatry & Behavioral Sciences)
This study explored a novel technique to alleviate the stress associated with quitting smoking, in hopes of greater success for smoking cessation programs.

Bioelectronic Medicine and Cholinergic Regulation of Postoperative Cognitive Dysfunction
Investigators: Niccolo Terrando (Anesthesiology), Warren Grill (Biomedical Engineering), Christina Williams (Psychology & Neuroscience), Chay Kuo (Cell Biology), Miles Berger (Anesthesiology)
After surgery, one side effect of anesthesia is a loss of cognitive function. This study developed a mouse model of this condition to begin exploring treatment and prevention options.

Chronic Pain
Investigators: Cameron R. ‘Dale’ Bass (Biomedical Engineering), Mohamed Abou-Donia (Pharmacology & Cancer Biology), Carolyn Pizoli (Pediatrics), Carrie Muh (Surgery), Bruce Capehart (Psychiatry & Behavioral Sciences), Mustafa Bashir (Radiology)
This study examined elite adolescent soccer players, known to have frequent mild on-field concussions, to better understand the effects of these hits on many brain-related functions.

Spinal Cord Stimulation to Treat Chronic Pain
Investigators: Warren Grill (Biomedical Engineering), Ru-Rong Ji (Anesthesiology), Nandan Lad (Surgery)
Spinal cord stimulation is a non-pharmacological way to treat chronic low back pain, but its techniques need to be optimized. This study explored a novel method of spinal cord stimulation in hopes of increasing the success of this approach.
DIBS Education

Undergraduate Neuroscience

In the 9 years since its inception, the undergraduate neuroscience major has rapidly grown from a graduating class of 10 students to becoming one of the most popular majors in Trinity College of Arts and Sciences. The major (BA and BS), minor, and certificate programs serve between 250 and 300 students annually, and between 70 and 80 students have graduated with a degree in Neuroscience for the past several years.

This year, DIBS created an Undergraduate Certificate in Decision Sciences. This program is led by Drs. Scott Huettel (Psychology & Neuroscience), Scott de Marchi (Political Science), Rachel Kranton (Economics), and Ronald Parr (Computer Science). Students complete coursework across these disciplines to examine how their approaches to decision making compare. Students earning this certificate will be able to engage in research with a broader perspective than that provided by any single major, preparing them to be interdisciplinary leaders of the future.

At the intersection of neuroscience and entrepreneurship

Cade Netscher (class of 2016) came to Duke fascinated by the brain and the prospect of applying neuroscience to address real-world challenges in everyday life. Cade’s intellectual journey led him to craft an interdepartmental major between neuroscience and philosophy. His passion for health, fitness, and competitive running and his growing interest in entrepreneurialism led him to an innovative vision for how these diverse interests might coalesce into something special and sustainable. This vision was cast and shaped during regular participation in a weekly running help session in Duke Forest offered by faculty member Len White for students in his neuroscience courses and others interested in the brain. Dr. White calls this activity “Neur-run” (help with neuroscience while trail running). Cade’s experience exemplifies the unique approach Duke takes to student learning, which values student-initiated interdisciplinary majors and novel teaching and mentoring approaches.

During his senior year, Cade co-founded “Neurun”, a company that uses virtual and augmented reality to enhance the mental experience of running. He hopes his products will allow runners to overcome mental barriers experienced during training and unlock the brain’s potential to maximize performance on race day. His company creates interactive virtual tours where race participants can click any mile marker on one of their race maps, enter the course at the selected point, experience a video tour of the course from a racer’s perspective, select the viewing speed, and learn the locations of hills, water stations, restrooms, and other valuable course-specific information, all from their mobile device. We marvel every day at the ingenuity shown by Duke students and strive to do our part to help them fulfill their dreams.

https://www.thinkneurun.com/ Cade named his company to reflect the inspiration he acquired through Len White’s Saturday morning runs.

The Undergraduate Impact of DIBS – by the numbers

Neuroscience courses offered

- 11 courses offered that are “owned” by NEUROSCI (not counting research practicums or research independent study course credits, enrolling a total of 225 students)
- 37 cross-listed courses: Psychology & Neuroscience (12), Biology (8), Biomedical Engineering (6), Linguistics (2), Pharmacology (2), Philosophy (2), Women’s Studies (1), Computer Science (1), Art History (1), Literature (1)
- 74.7% of research credits mentored by faculty in the School of Medicine (Psychiatry and Behavioral Sciences = 31%, Neurobiology = 20.3%, Neurosurgery = 3.1%, Pharmacology & Cancer Biology = 2.5%, Anesthesiology = 3.7%, Neurology = 4.3%, Pediatrics = 2.9%, Medicine = 1.8%, Cell Biology = 1.8%, Radiology = 2.5%, Ophthalmology = 6%, Neuroradiology = 6%)
- 21.6% of research credits mentored by faculty in Trinity College of Arts & Sciences (Psychology & Neuroscience = 13%, DIBS = 5.5%, Biology = 2.5%, Wellness & PE = 6%)

Peer-reviewed publications in FY17 co-authored by undergraduate neuroscience majors

162 Number of research credits earned by Neuroscience majors

(1 term of research = 1 credit)

73 Neurosciences major graduates in the Class of 2017

47 Students enrolled in our “gateway” neuroscience course

14 Neuroscience minor graduates in the Class of 2017

304 who earn “Graduation with Distinction in Neuroscience” honors (college-wide goal = 25%)

who are matriculating into medical school in 2018

who long-range goal is neuroscience (PhD)

42.4% whose long-range goal is medicine

14.1% whose long-range goal is neuroscience (PhD)

70% whose long-range goal is neuroscience (PhD)

Duke Institute for Brain Sciences
Preparation Students for a Career in Neuroscience


DIBS Education

Preparing Graduate Students for a Career in Neuroscience

Neuroscience Bootcamp

At the beginning of each fall semester, graduate students entering PhD programs in a wide range of fields including neurobiology, cognitive neuroscience, psychology, biomedical engineering, environmental toxicology, evolutionary anthropology, nursing, and philosophy, gather for an intensive two-week ‘Neuroscience Bootcamp’. This Bootcamp introduces students to the Duke neuroscience faculty and community and provides valuable information to promote success in graduate school and ensure access to helpful university resources and opportunities. Neurobiology faculty Greg Field, Richard Mooney, and Elizabeth Johnson provided leadership and the overarching vision for the fall 2016 Bootcamp. Program coordinator Tanya Schreiber did the administrative legwork to make this vision happen. A broad range of topics was presented by Duke experts in their respective fields, from Anne West’s seminar on molecular neuroscience research methods and John Pearson’s on computational neuroscience to Walter Sinnott-Armstrong’s on neuroethics.

Since one of the aims of the course is to make students aware of resources available to them at Duke, students also heard presentations on some of the university’s state-of-the-art core research facilities, visited the EDGE for a presentation on Data Visualization Services, and toured the Physics machine shop and the Innovation Studio where they saw 3D printers in action and learned how they could order custom parts.

Another important goal of the Bootcamp is to promote interaction and a sense of social cohesion among graduate students in all brain-related disciplines on campus. Students bond with each other over daily lunches and hands-on labs. They interact with faculty in a social setting during three dinners in downtown Durham. Following Bootcamp, students emerge with a deeper understanding of both their neural and professional networks, prepared to make the most of their graduate career in Neuroscience at Duke.

DIBS support helps students compete for fellowships that expand learning

Duke Cognitive Neuroscience graduate student Peter Whitehead has benefited from the mentoring he has received from Drs. Tobias Egner and Marty Woldorff. Part of that mentoring is helping students compete successfully for awards that will expand their learning outside of the Duke campus. Peter applied for and was awarded fellowships from the NSF GRFP (National Science Foundation Graduate Research Fellowship Program) and the NDSEG (National Defense Science and Engineering Grant) program. While the NSF GRFP and NDSEG are similar in that they both fund the graduate student’s stipend and some associated educational expenses, the NSF GRFP also allows the recipient to apply for international research and professional development opportunities. Because of his interest in studying abroad, Peter has chosen to accept the NSF GRFP award, which allows him to apply for further NSF grants such as NSF GROW (Graduate Research Opportunities Worldwide). Said Peter, “I am very lucky to have these opportunities, and thank my cohort, colleagues, and PIs for their help. I hope to take advantage of the possibility for international collaboration that the NSF offers to continue growing as a researcher.”

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DIBS Education

2017 Bass Connections in Brain & Society

DIBS Bass Connections in Brain & Society engages undergraduates, graduate students, postdoctoral fellows, and faculty from different disciplines in an immersive curriculum that combines research and coursework and culminates in a multidisciplinary, team-based project. Nine Bass Connections in Brain & Society teams involving 59 students and 33 faculty members were involved in projects that spanned topics from improving neurosurgery patient outcomes in Uganda to novel assessment of mild traumatic brain injury in children to understanding how we perceive beauty and art. The students also take part in a Career Development workshop series and several networking events throughout the year of participation.

Art, Vision and the Brain: Autism and Face Processing
Using art to understand our social and visual experiences
Team Leaders: Elizabeth Johnson, Michael Murias, Marianne Wardle

Beauty in Balance and Balance in Beauty: An Exploration of the Role of the Laws of Physics in Abstract Modern Art
Explore harmony, balance, and rhythm in physics and visual art
Team Leaders: Erin Hanas, Tomasz Hueckel, Amilcare Porporato, Marc Sommer

Brain-Immune Interactions in Neurodegenerative Disease
Join us to search for novel approaches to find a cure for Alzheimer’s disease.
Team Leaders: Ornit Chiba-Falek, Carol Colton, Kirby Gottschalk

The Construction of Memory at Duke and in Durham: Using Memory Studies Understanding history creates understanding of ourselves. How can a University and a town connect with their complex past?
Team Leaders: Robin Kirk, Barbara Lau, Irene Silverblatt, Patrick Stawski

Improving Neurosurgery Patient Outcomes in Uganda
How can we make neurosurgery safer and more effective in the developing world?
Team Leaders: Michael Haglund, Emily Rose Smith, Anthony Fuller

Neuroplasticity: Leveraging New Media & Digital Storytelling to Connect Society to Neuroscience
How can we make neuroscience and neuroscientists more accessible to the public?
Team Leaders: Mark Olson, Nina Sherwood

Oculomotor Response as an Objective Assessment for Mild Traumatic Brain Injury in the Pediatric Population
Develop objective tools to gather real-time data in young athletes to assess sports-related head injuries
Team Leaders: Dale Bass, Jason Luck, Bruce Capelhart, Adam Menlenbacher, Carrie Muh

Reconsidering Addiction and Opioid Abuse: Is There a Causal Chain Between Opioid Addiction, Morbidity, and Mortality?
How can we use big data to help doctors prevent opiate addiction and overdose?
Team Leaders: Thomas Buchleit, Christopher Edwards, Matt McCubbins, Steven Prakken

Stemming the Opiate Epidemic through Education and Outreach
Solutions to the opiate epidemic already exist; the next step is educating the public about these resources.
Team Leaders: Andrew Musyk, Nicole Schramm-Sapyta

Bass Connections Brain & Society/DIBS mentions in Duke media
12 outlets (print, web, and broadcast)

Bass Connections Brain & Society/DIBS mentions in non-Duke media
2
Community Engagement

DIBS brings our community together, both on and off Duke’s campus

DIBS-sponsored events for the Duke neuroscientific community

- Center for Cognitive Neuroscience seminar series and annual retreat
- Center on Addiction & Behavior Change seminar series
- Neuroimmunology & Glia Research Group monthly meetings and annual retreat
- Duke Center for Autism & Brain Development’s Autism Awareness Month feature lecture
- Gastronauts symposium
- Neuroscience Graduate Consortium’s annual Brainaroo science day

Brainaroo

For the past 6 years, the Neuroscience Graduate Consortium has hosted “Brainaroo,” a fun event for Duke graduate students who, regardless of departmental affiliation, share a common interest in studying the brain. The event aims to build community and foster collaboration among all graduate students with an interest in neuroscience and provides an opportunity for them to come together to talk science and celebrate their research accomplishments. This year’s Brainaroo was held on May 19, 2017 and featured a student poster session, a faculty panel debate, and student talks, with prizes awarded for best poster and best student talk. The event was coordinated by graduate student Consortium leaders, Sam Brudner and Kiersten Ruda, and hosted in the DIBS cube.

DIBS-sponsored events for the broader Durham and North Carolina community

Several DIBS faculty spoke at events in the community this year, including talks held at the Durham County Library, Osher Lifelong Learning Center at the Jewish Community Center, Alamance Community College, and local elementary schools.

DIBS Discovery Day

On a beautiful Sunday afternoon in April, approximately 300 people went underground in the DIBS cube to learn about the brain. This family-friendly event was a collaborative effort between the Bass Connections Brain & Society Theme, DIBS staff, and a cadre of enthusiastic cognitive neuroscience graduate students. Families learned about how one Bass Connections team tests for concussions in high school football players. Kids recorded electrical activity from the neurons of live crickets, made “Thatcherized” images of their faces (see image), and made anatomically-correct brain hats. There was also information about the safe use of prescription opioid medication, brain-stimulating activities to ward off Alzheimer’s disease, and, of course, real human brains to be held. Everyone walked away with smiles on their faces, in the right-side-up orientation!
Fetal Alcohol Spectrum Disorders: A Symposium for K-8 Educators

Fetal Alcohol Spectrum Disorders (FASD) result from fetal exposure to alcohol at any time during pregnancy—even in small amounts. In the United States, the prevalence of FASD is approximately 2-5 percent of children. These children require special support in the classroom to help them succeed. On March 24, 2017, over 150 K-8 educators from 40 counties in North Carolina gathered at Duke to learn how to best identify and support these students in the classroom. Experts presented information about the neurocognitive effects of alcohol on the developing brain, the corresponding learning and behavioral dysfunction, and specific classroom strategies to help children with FASD learn better. Professor Rochelle Schwartz-Bloom, director of the symposium, remarked, “Educators came up to me after the symposium and stated that it was the best and most helpful symposium they had ever attended. I think that speaks very well for Duke and our commitment to serving our local and statewide community.” The symposium was video-recorded and is available for viewing at: https://youtu.be/xrmucyqet-txi. This event was co-sponsored by DIBS, the Duke Center for Science Education, and the Duke Program for Education.

The Opiate Epidemic: How Science Shapes Policy

Sometimes the world has hard questions that science can answer, but it’s up to scientists to make sure those answers are translated into solutions that have real world impact. The opiate addiction and overdose epidemic is one of the most difficult challenges faced by society today. In March, DIBS Center on Addiction and Behavior Change (CABC) hosted a workshop led by the Policy Bridge Program from Duke’s Sanford School of Public Policy. At the workshop, scientists learned how to translate their scientific findings into a compelling message that would be heard and understood by policy makers. Scientists learned the importance of timing - to be ready at a moment’s notice - because a politician’s world is often less predictable than the world of academia.

One of DIBS Bass Connections Brain & Society teams has taken the workshop’s lessons to heart. The “Stemming the Opiate Epidemic through Education and Outreach” team has spent the past year educating themselves and the public about a wide range of perspectives on the opiate epidemic, including medical and counseling providers, law enforcement/first responders, patients, family advocates, and policy-makers, to name just a few. Now, the team is poised to take action. In the second year of the project, the team is implementing a program to distribute the life-saving medication Naloxone in the Duke Emergency Department and is continuing to work with Policy Bridge to organize briefings for legislative staff in Raleigh, NC and Washington, DC. These and other examples illustrate the power of neuroscience to begin to address some of society’s largest public health crises. The team’s work was featured in a story in the Duke Chronicle, which was reposted in The Overdose Report and InTo Rehab.

In March, DIBS Center on Addiction and Behavior Change (CABC) hosted a workshop led by the Policy Bridge Program from Duke’s Sanford School of Public Policy.
Philanthropy

Focus on philanthropy: A few examples

Wrenn Trust encourages students to tackle the challenge of Alzheimer’s Disease

Two Duke alumnae are having a profound impact on education and research into Alzheimer’s disease. Karen L. Wrenn died of Alzheimer’s disease and named her dear friend, Marjorie Thomas, the trustee of her foundation. Ms. Thomas has since become a tireless advocate and scholar of Alzheimer’s research and treatment. Over the past several years, the Wrenn Trust has sponsored several Bass Connections Brain & Society teams and a lectureship. This year, for the first time, the trust expanded its support with two graduate travel awards and a graduate fellowship. Students Caley Burrus and Zachary Monge were awarded the travel awards, and Yixin Ma was awarded the Graduate Fellowship. By encouraging students to get involved in Alzheimer’s disease research, the Wrenn Trust will have far-reaching impact in shaping the careers of students at Duke.

Travel awards supported by the Wrenn Trust provide students with an opportunity to network with other students and faculty, expand their base of knowledge, and learn how to present their work to diverse audiences. Caley Burrus works in the lab of Dr. Cagla Eroglu studying cellular autophagy and neurodegenerative disorders. She used the travel funds to attend the Society for Neuroscience (SfN) Annual Meeting in November 2017. At the conference he will be attending talks to learn about the most recent Alzheimer’s disease research and will also be presenting an abstract titled “Search and recovery of autobiographical and laboratory memories: Shared and distinct neural components.”

Yixin Ma, a PhD graduate student in the Duke Medical Physics Program, was selected to receive the inaugural Karen Wrenn Graduate Fellowship in Alzheimer’s Disease Research to conduct her clinical research project focused on identifying neuroimaging biomarkers for disease detection at the very early stage. Yixin, a Duke Chancellor’s Scholar with a cumulative GPA of 4.0, will begin her dissertation project this fall in the Alzheimer’s Imaging Research Laboratory under the direction of Jeffrey Petrella, MD, Professor of Radiology. Together with both clinical and technical development teams, Yixin proposes to develop innovative ultrahigh-resolution diffusion MRI methods to detect and characterize early microstructural brain changes associated with Alzheimer’s Disease. The Wrenn Fellowship will provide $40,000 per year for 3 years of Yixin’s research.

Gift helps support an annual event to increase autism awareness

Stacy Coulter and James Barrett are providing support that is increasing synergy between the Duke Center for Autism and DBBS broader mission to support brain science. Their gift was used in part this year to support an annual autism awareness event at Duke that brought together scientists, educators, clinicians, parents and other family members, and people on the autism spectrum. This year’s event featured Emmy Award-winning journalists John Donvan and Caren Zucker, who are the authors of In a Different Key: The Story of Autism, a New York Times best-seller that chronicles the history of autism. Donvan and Zucker’s presentation, entitled “Autism’s First Child: Lessons on Acceptance, from a Small American Town,” featured inspiring stories of people’s resourcefulness and determination that have had a major impact on those affected by ASD. The well-attended event emphasized the importance of accepting and valuing those with autism spectrum disorder and welcoming them into our broader communities and society.

Donation supports novel approaches to diagnosing autism

Drs. Andrea and Harry Styli made a generous donation to DBBS and the Duke Center for Autism and Brain Development that established the Styli Translational Research Program. This program supports a collaborative project with Progenity, Inc. aimed at identifying early diagnostic biomarkers for autism, as well as broader interdisciplinary neuroscience research through DBBS Bass Connections in Brain & Society. This award also supports the career development of junior faculty conducting neuroscience research at Duke.

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Looking ahead to FY18

The Duke Institute for Brain Sciences recently transitioned to a new form of leadership and governance. DIBS is now led by a Faculty Governance Committee representing faculty members from Arts and Sciences, Engineering, Kenan Institute of Ethics, and the School of Medicine. A new Chief Operating Officer was hired to lead the operational aspects of DIBS. A key purpose of this new structure is to promote deeper engagement of the faculty, graduate students, and postdoctoral scholars at Duke in setting the priorities for DIBS.

Under this new leadership, key goals for FY2018 are to:

- Define the strategic priorities for DIBS. The creation of a reinvigorated strategic plan for DIBS, led by the Faculty Governance Committee, will be an inclusive process incorporating the perspectives of the diverse community of faculty, postdoctoral scholars, and students who are passionate about brain sciences and shaping the future of DIBS. Based on their input, the strategic plan will identify new approaches and objectives to fulfill DIBS mission of facilitating interdisciplinary collaboration, educating students in neuroscience, promoting novel discoveries related to brain sciences, and transforming those discoveries into applications with real-world impact. Implementation of the new priorities defined by the strategic plan will begin in FY18.

- Enhance DIBS communication efforts, both internally and externally to Duke. We plan to hire a new Communications Director and promote broader engagement with DIBS by students, faculty, and donors. This will be accomplished by developing strong messages, both internally and externally, that effectively communicate DIBS mission and activities and foster greater involvement in DIBS.

- Increase the impact and breadth of DIBS seed funding for innovative research. We plan to implement strategies to increase the number of Incubator Award applications from investigators in the Arts and Sciences, provide feedback to faculty whose applications were not funded to promote future successful applications, create a system to track the impact of Incubator Award funding, and seek philanthropic donations to augment the amount and scope of research seed funding for Duke faculty.

- Transition the Undergraduate Neuroscience Major from DIBS to the Department of Psychology and Neuroscience. We plan to transition the undergraduate neuroscience major and participating faculty from DIBS to the Department of Psychology & Neuroscience, with a goal of facilitating greater focus on scientific activities within DIBS while promoting synergies and collaboration between DIBS and Psychology & Neuroscience that will continue to provide a robust learning environment for students in the neuroscience major at Duke.

- Cultivate and expand the number of Interdisciplinary Centers and research groups that are part of DIBS. We will explore the creation of new Centers and work groups that reflect emerging new DIBS priorities in the areas of neural engineering, neurotechnology, computational neuroscience, translational neuroscience, neuroimmunology, and pediatric neuroimaging.

- Strengthen interdisciplinary graduate and post-doctoral education. We plan to host several career development activities for graduate students and post-doctoral fellows in all branches of neuroscience on campus. Utilizing our network of recent graduates and industry and philanthropy partners, we also will implement new ways to help graduate students and postdoctoral fellows transition successfully to the next stages in their careers in research, education, policy, and industry.

- Foster interdisciplinary undergraduate education. We will continue to explore new opportunities to enhance our educational experiences for undergraduate students, including the popular Summer Neuroscience Program, Neuroscience Bootcamp, and highly successful Bass Connections in Brain & Society projects. Philanthropic funding will provide Duke undergraduates with unique learning experiences through fellowships.

- Explore partnerships with industry. We will identify strategies to develop collaborations with industry with input from the DIBS External Advisory Board, which includes several industry leaders.

- Promote development and fundraising. We will continue to work closely with Duke’s Development Office, and we will foster active engagement and financial support from the DIBS External Advisory Board, with goals that include obtaining new awards to support DIBS evolving priorities, deepening our engagement with current prospective donors, and providing consistent stewardship of current bills donors.
### Total Grants budgets FY17

#### Awarded—for all years of award (many are multi-year awards)

<table>
<thead>
<tr>
<th></th>
<th>Direct Costs</th>
<th>F&amp;A Costs</th>
<th>Total Costs</th>
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<tbody>
<tr>
<td>DIBS Faculty</td>
<td>$174,244</td>
<td>$34,310</td>
<td>$208,554</td>
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<tr>
<td>School of Medicine Faculty</td>
<td>$421,396</td>
<td>$248,624</td>
<td>$670,020</td>
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<tr>
<td>Provost-Area Faculty</td>
<td>$3,622,228</td>
<td>$1,573,738</td>
<td>$5,195,966</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$4,217,868</strong></td>
<td><strong>$1,856,672</strong></td>
<td><strong>$6,074,540</strong></td>
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#### Spending and F&A Recovery (actual spending in the current year)

<table>
<thead>
<tr>
<th></th>
<th>Expenditures</th>
<th>F&amp;A Recovered</th>
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<td>DIBS Faculty</td>
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<td>$92,709</td>
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<tr>
<td>School of Medicine Faculty</td>
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<td>$230,895</td>
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<tr>
<td>Provost-Area Faculty</td>
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<td>$1,042,003</td>
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<td><strong>TOTAL</strong></td>
<td><strong>$4,753,129</strong></td>
<td><strong>$1,365,607</strong></td>
</tr>
</tbody>
</table>

**Table 1.** Funds flows through DIBS grants and contracts team

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**Appendix 2**

**Figure 1.** 2016-2017 Bass Connections in Brain & Society undergraduate student majors

**Figure 2.** 2016-2017 Bass Connections in Brain & Society distribution of funds by team leader affiliation

**Figure 3.** 2016-2017 Bass Connections graduate student areas of study