The University of Texas at Dallas

School of Behavioral and Brain Sciences

2023 ANNUAL REPORT

Dear Friends,

Greetings and welcome to the third annual report of the School of Behavioral and Brain Sciences at The University of Texas at Dallas! With 2,500 undergraduate students, 500 graduate students, 64 faculty members, 15,000 alumni, and many friends, we share an ambition of excellence in research and education that is applied in service to our community — here in North Texas and more broadly around the world.

Our outstanding faculty in the Departments of Psychology, Neuroscience, and Speech, Language, and Hearing investigate behavior, the brain, and how they intersect. We try to understand how they work and develop under normal circumstances, what changes under stressful or damaging circumstances and conditions, and what might be targeted successfully by therapeutic interventions.

These intersections and interactions are relevant for research and for societal impact. There are many examples: Suppose an individual has a stroke leading to problems speaking or understanding language (aphasia). Can we use behavioral interventions to alter brain activity and cellular and molecular functioning? Suppose someone has post-traumatic stress disorder. Can we use brain electrical stimulation to reduce traumatic stress? Suppose a child is diagnosed with autism spectrum disorder. Can behavioral interventions that target shared joint attention between parent and child serve to improve the child's developmental outcomes? In these cases, and many others, the answer is a profound "yes" — and multiple BBS researchers are doing exactly that. There are many other examples, including chronic pain, hearing loss, learning and memory, risks of poverty for children's development, racial and ethnic prejudice, disparities in school readiness, addiction, aging and dementia, anxiety and depression, stroke, schizophrenia, ASD among adults, speech and language development, and disorders of consciousness.

The topics we investigate are the same topics we teach. We have extraordinary students at undergraduate and graduate levels, including master's students in top-10, nationally ranked programs in speech pathology and audiology; research master's students preparing for a wide array of careers as well as their further education; and talented and creative PhD students honing their research skills preparing for their future careers.

In addition to the teaching and research missions of BBS, our six research centers — Callier Center for Communication Disorders, Center for BrainHealth, Center for Vital Longevity, Center for Children and Families, Center for Advanced Pain Studies, and Texas Biomedical Device Center — are well-known for their outstanding work in clinical services, public education and community service.

This report provides pictures and stories for a glimpse of the school's activities over the past year and a variety of our many faculty and students. Please let us know how our stories capture your imagination and how they might stimulate you to help us build new programs, recruit top talent for a growing faculty and outstanding students, and apply what we do in addressing real-world issues in the wider community.

Thank you for your support.

Extending kind regards,

Margaret Tresch Owen
Interim Dean, School of Behavioral and Brain Sciences

UTD Neuroscientist Leads National Pain Project with $11.3 Million NIH Grant

A University of Texas at Dallas researcher is leading a team of national experts in a new National Institutes of Health multicenter project focused on elucidating the origins of pain.

Ashbel Smith Professor of Neuroscience **Dr. Ted Price BS'97** received a five-year, $11.3 million grant from the National Institute of Neurological Disorders and Stroke to launch the Human Nociceptor and Spinal Cord Molecular Signature Center. Researchers will focus on expanding knowledge about the genesis of human pain at the cellular and molecular level, with the goal of finding new approaches to treat pain.

"The data we will generate on the cells that comprise the first part of the human pain pathway will fundamentally change the way that we think about pain and how we develop therapeutics," said Price, who is the founding director of the Center for Advanced Pain Studies (CAPS) at UT Dallas.

Price's co-principal investigators are Dr. Patrick M. Dougherty, H.E.B. Professor in Cancer Research in the Department of Pain Medicine at UT MD Anderson Cancer Center, and Dr. Michele Curatolo, director of the interventional pain program at University of Washington Medicine in Seattle. Working both independently and collaboratively, all three have used human dorsal root ganglia (DRG) — specialized nerve cells clustered near the base of the spine — to understand mechanisms that cause chronic pain.

"It's really exciting to work with these other great groups on what is a very new kind of project for the pain field," Price said. "I don't think there's ever been a big project quite like this — aimed at describing the human pain system at this level of detail."

Price and his UTD team have previously documented the transcriptome of human DRG cells — a chart of the messenger RNA (mRNA) molecules produced by those cells. That work has revealed unique features of the human nervous system at the single neuron level, helping elucidate why pain relief solutions in animal models work infrequently in people.

"While we may understand pain pretty well in animals at this point, we don't understand why that information translates — or fails to translate — to humans," he said. "The point of this initiative is to gain fundamental understanding of why that animal work isn't translating and to use that information to do a better job of developing pain therapeutics that can stop pain at its source."

Researchers will study DRG tissue from organ donors to characterize the neurons of the peripheral nervous system and learn how nociceptors — the part of a nerve cell that responds to pain stimuli — are activated

Dr. Ted Price BS'97 with a colleague in his lab

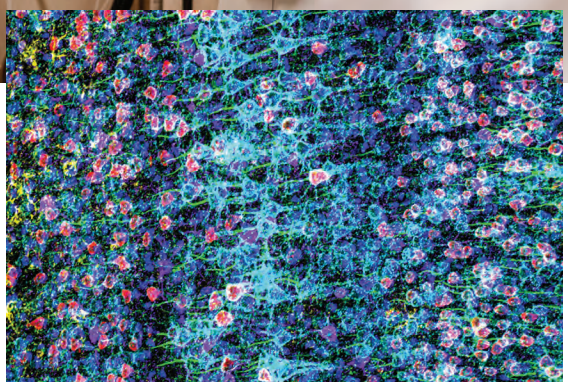
in chronic pain disorders. They also will use the tissue samples to better understand how neurons communicate signals along the human pain pathway between nociceptors that innervate tissues in the body and spinal cord neurons that send signals to the brain.

"My hope is that in the next five years, we will have very detailed molecular information about the human peripheral nervous system — how it changes with age, and, hopefully, how it changes with chronic pain," he said. "I also hope that we'll understand how pathology in the lower back interacts with the peripheral nervous system to cause low back pain, a severe problem that many people have."

A project already underway at CAPS is focused specifically on low back pain. Researchers are comparing DRG and other samples from people who have back- related surgeries with other data to understand the mechanisms that drive low back pain.

"It's really exciting to work with these other great groups on what is a very new kind of project for the pain field."
Dr. Ted Price BS'97

"Low back pain is the costliest form of chronic pain and the most disabling. By some measures it is the most disabling disease in the world," Price said. "There are few animal models of chronic low back pain because you can't model it in animals that don't walk upright."



Neuron imagery from the CAPS lab

Price said a better understanding of how the spinal cord relays pain signals received from nociceptors to the brain will aid in finding pharmacological solutions for chronic pain.

"We know some things now, but not nearly as much as we should. I think we'll have fine molecular detail that will inspire many new projects on drug targets that could lead to a true next generation of pain therapeutics," he said.

Price said an important goal of the new center is to establish the scientific foundation that will empower pain researchers around the world to approach the problem of treating pain in a new way.

"It's our mission to disseminate data as comprehensively and as quickly as we can so that it becomes a foundational community resource for the field," he said. "We're proud to take on that huge responsibility."

Center for Vital Longevity Broadens Scope to Cover Full Lifespan

The University of Texas at Dallas' Center for Vital Longevity (CVL) is expanding the scope of its research to include work on children and teenagers, with two newly hired faculty bolstering the center's range of study.

CVL Director **Dr. Michael Rugg** describes the strategy as an extension that is compatible with the existing notion of the center's mission: to use cutting-edge behavioral and cognitive neuroscience research methods to understand and optimize cognitive health for life.

"We have always considered ourselves to be interested in change across the entire lifespan. Most of our labs' research to this point has included participants from early adulthood through to later life," said Rugg, professor and holder of the Distinguished Chair in Behavioral and Brain Sciences. "We're adding two new research groups that strengthen and extend our mission of understanding cognitive and brain changes throughout life."

Rugg explained that the addition of **Dr. Noa Ofen** and **Dr. Leehyun Yoon** to CVL's faculty will make it easier to characterize lifelong trajectories of cognitive health and is part of a multi-year initiative within the School of BBS to expand research in lifespan cognitive neuroscience.

"Our slogan, so to speak, remains 'cognitive health for life.' It works just as well for a 10-year-old as for a 70-year-old," Rugg said. "The goal of understanding how we can help people have the most successful cognitive trajectory throughout their lives stays the same."

The broadening of scope is in part a response to increasing evidence that some of the precursors of successful versus unsuccessful brain aging in later life emerge early in the lifespan — perhaps even prior to birth.

"It is increasingly clear that there is a gray area between cognitive impairment as you grow older and frank neurodegenerative disease," Rugg said. "With the increasing recognition that changes in cognitive and brain function occur across the entire lifespan — and that some of the precursors of successful cognitive aging are rooted in development — we are expanding our research portfolio to include researchers who are studying social, cognitive and brain development."

As an example, Rugg cited recent re-evaluation of the significance of cortical thickness throughout life.

"For people in their 70s, there is a correlation between how thick the cortex is and general cognitive ability, when all other things are held equal. That's sometimes

Pictured from left are Dr. Karen Rodrigue, Dr. Michael Rugg, Dr. Chandramallika Basak, Dr. Gagan Wig, Dr. Kendra Seaman, Dr. Kristen Kennedy and, seated, Dr. Denise Park.

been thought to be a consequence of differential thinning of the cortex during adulthood," he said. "But it turns out that cognitive ability at age 11 shows an equally strong correlation. This finding suggests that associations between cognition and cortical thickness are lifelong.

"The implication is that we need to understand more about optimal brain development during childhood and early adolescence, because it can have important consequences for how well people do cognitively in later life. It's a startling observation."

Ofen arrives from Wayne State University in Detroit, where she was director of the Cognitive and Brain Development Laboratory. Her research seeks to discover how brain structure and function shape human cognitive functioning across development, particularly in the hippocampus, a crucial structure for learning and memory that appears altered in several neurodevelopmental disorders.

"The goal of understanding how we can help people have the most successful cognitive trajectory throughout their lives stays the same."
Dr. Michael Rugg

Yoon comes to UT Dallas from the University of California, Davis, where she was a postdoctoral scholar. She studies social development in adolescents, with a focus on neural and psychological mechanisms of learning, thinking, and presenting about the self in social contexts. She seeks to identify cognitive and neural processes that are predictive of the development of mood disorders and interpersonal problems in youth, and studies the effects of deprivation and negative social interactions on social and affective brain development.

UT Dallas to Establish Psychological Services and Education Center

The UT Dallas School of Behavioral and Brain Sciences has received $1.5 million in federal funding to develop a center that will incorporate in-person care, telehealth and educational programs in behavioral health.

With a projected opening date in about two years, the Psychological Services and Education Center will provide training for students in UT Dallas' planned clinical psychology PhD program.

"This resource will serve as the in-house training center for students in our new clinical psychology programs," said BBS interim dean **Dr. Margaret Owen**, Robinson Family Professor and director of the Center for Children and Families. "By augmenting the mental health workforce of North Texas and providing faculty-supervised clinical services, we will enhance the availability of mental health care in our region."

Dr. Stacie L. Warren, associate professor of psychology and head of the committee formed to build the new degree program, applied for the congressionally directed funding, which was awarded through the Health Resources and Services Administration of the U.S. Department of Health and Human Services after passage of the Consolidated Appropriations Act. Part of the grant will be used to renovate space in Synergy Park North 2 that has been allocated for the center, which will include facilities for new faculty, individual therapy and group intervention rooms and assessment rooms, workstations, student training areas and essential technology.

"Developing this clinical program is a real win for our department, BBS, UT Dallas and the community."
Dr. Shayla Holub

Warren said the services and education center will accelerate the development of the clinical science PhD offering.

"Clinical science is the integration of research and practice and having an affiliated care center is common among training programs," she said. "What will be different at UT Dallas, however, is that the core clinical program faculty will be supervising clinical students and offering a range of practicum experiences, weaving together research with hands-on practice."

The center will bring reduced-cost, advanced mental health assessment and intervention services to underserved communities in the Dallas-Fort Worth area and expand educational programs to enhance the local mental health workforce, Warren said.

"Mental health access for low-income populations faces a huge barrier — patient-to-provider ratios may be as high as a thousand to one," she said. "This grant will increase accessibility while we train our students to

Pictured from left are Dr. Amy Pinkham, Dr. Regina Ybarra, Dr. Shayla Holub, Dr. Stacie L. Warren and Dr. Jerillyn Kent.

become the best clinical scientists. Our center will also be outfitted with telehealth services to reach people who can't reach us."

Warren and her colleagues — including **Dr. Amy Pinkham**, professor of psychology; **Dr. Shayla Holub**, associate professor and psychology department head; **Dr. Jerillyn Kent**, assistant professor of psychology; and professor of instruction of psychology **Dr. Regina Ybarra** — have been working for more than a year to establish curriculum, practicums, clinical training material and training philosophy.

"Developing this clinical program is a real win for our department, BBS, UT Dallas and the community," Holub said. "Many departmental faculty already study topics relevant to clinical science, so creating a clinical program is a natural next step. It is my hope that it fosters new collaborations among faculty, and perhaps even inspires a new lens on research."

New faculty members **Dr. Jennifer L. Callahan** and **Dr. Camilo Ruggero** will arrive Jan. 1 from the University of North Texas to help with the formative stages of both the PhD program and the center.

Warren said that UTD's clinical psychology program, which will enroll students no sooner than fall of 2025, will seek accreditation solely from the Psychological Clinical Science Accreditation System (PCSAS), a newer training model that Warren benefited from while a student at the University of Illinois at Urbana-Champaign, the first university program accredited by PCSAS.

"To date, there are no clinical programs solely PCSAS-accredited that did not come from a background of American Psychological Association accreditation," Warren said. "The PCSAS board just released guidelines and a pathway for programs such as ours to become accredited."

Warren described UT Dallas as a perfect place to develop a clinical program due to the immense research resources and the existing faculty who do fundamental research on clinical phenomena.

"When I was offered the chance to come to UT Dallas, I was incredibly intrigued because to be a part of building a program from the ground up is not an everyday experience, and they wanted to follow the PCSAS model," she said. "I just thought, 'My goodness, I've won the lottery.'"

Pinkham said that UT Dallas, with its tradition of academic and research excellence, is the perfect place for graduate students to advance knowledge in psychopathology intervention and assessment strategies while making a positive impact on the mental health of their community.

"Adding a clinical psychology doctoral training program that is heavily geared toward research will align UT Dallas with some of the best and most innovative universities in the country," she said.

FROM THE BENCH TO THE BEDSIDE AND BACK

Joint faculty appointments between The University of Texas at Dallas and UT Southwestern are advancing research and patient care.

Shuttling between research labs, clinics and classrooms, assistant professors **Dr. Adrianna Shembel** and **Dr. Anila D'Mello** are the first two BBS faculty members to be recruited to joint appointments at UT Dallas and UT Southwestern Medical Center.

Attracted by the opportunity to directly apply work in the lab to the realm of patient care while adding a third element of teaching graduate courses represents something of a professional trifecta for both professors.

Shembel says the success of the 50/50 appointment is found in collaboration.

"It only works if everyone has the same goal, and I've found collaboration to be fantastic between the two institutions," said Shembel, a licensed speech-language pathologist specializing in voice and laryngeal disorders who seamlessly connects research with patient care. "I like to say, 'From the bench to the bedside and back,' because many clinicians have a mindset of helping individual patients, but by doing research, you're helping a whole population."

Since completing her postdoctoral work at New York University's Grossman School of Medicine, Shembel has focused on the relationship between the respiratory system and the larynx in patients with sensorimotor voice disorders.

"I'm particularly interested in vocal dysfunction due to neuromuscular diseases like Parkinson's," she added.

In the psychology department, D'Mello — who trained at the McGovern Institute for Brain Research at the Massachusetts Institute of Technology — says the caliber of the research at UT Dallas and the reputation of UT Southwestern made the joint appointment extremely attractive.

"I feel privileged to be amongst many researchers at UTD whose research I've been reading and citing since I was in graduate school," she said.

Despite some initial trepidation with accepting the joint appointment, D'Mello hasn't looked back.

"At first I thought, 'Wow, this is going to be tough; I have one foot in one world and one foot in another,'" she said. "But it's actually been the best of both worlds."

D'Mello's lab studies the neurological basis of language and cognition across typical development and in autism, with a focus on understudied regions of the brain such as the cerebellum. In one study, she is exploring regions of the brain engaged by affinities or special interests, and she hopes to change the conversation on understanding autism, and supporting the needs of those with autism.

"Standardized testing and assessments are crucial, and we've learned so much, but in certain cases, it might be hiding something that is there," she said.

D'Mello says that despite 90 percent of autistic children and adults having unique special interests, the aim of conventional therapy is to simply not talk about them.

"We're finding when kids and adults are allowed to engage with things they really like, you begin to see their language abilities differ from what standardized assessments indicate," she added.

Although it is early days for each, the connections being formed by Drs. Shembel and D'Mello are increasing the level of collaboration between the two institutions.

"I see it as a very positive step in bringing together the science and the medicine," said **Dr. Colleen Le Prell,** head of the Speech, Language, and Hearing Department

at UT Dallas. "Bringing together people with different roles within the same topic area will take us further than if any one of us were doing our work independently."

That link between science and medicine is also benefiting UT Dallas graduate students as it increases their exposure to the labs and patients at UT Southwestern. Shembel recalls a recent consultation at the clinic where she diagnosed a patient with vocal strain, fatigue and gastro issues.

The patient "literally started crying in front of us and said that we were the first people to tell her why she had lost her voice," said Shembel, who called it a profound experience for the students who were with her at the time. "It demonstrated the importance of being up-to-date on the research to help your patients."

Some of those students may soon get an opportunity to experience even more patient interactions through internships and fellowships at UT Southwestern, another benefit of the growing teamwork building around the joint appointments.

Shembel's succinct academic approach — "from the bench to the bedside and back" — is something more than a philosophy: It has become a stellar example of UT System collaboration.

Dr. Adrianna Shembel

Dr. Anila D'Mello

Dr. Colleen Le Prell

New Center to Bolster Clinical Research Studies at UT Dallas

UT Dallas' School of Behavioral and Brain Sciences and Office of Research and Innovation have collaborated to create The University of Texas at Dallas Clinical Trials Unit (CTU), a centralized location and source of support for human trials of therapeutic drugs and devices.

The new clinical and translational research unit at UT Dallas will facilitate the assessment of novel therapies for human disease, focusing initially on disorders and conditions of behavior and the brain, and will be available to any UT Dallas faculty conducting such research. Early clinical trials are anticipated in hearing loss, pain and neurological disease.

Dr. Margaret Owen, Robinson Family Professor and interim dean of BBS, emphasized the impact that the Clinical Trials Unit will have on the surrounding community, taking discoveries in non-clinical research and new ideas for applied research interventions, and guiding those through the trial process toward solutions to everyday problems.

"The resources that will become available here for bridging basic research to evidenced interventions will greatly benefit the larger community, with potential for addressing many needs," she said.

Professor of Neuroscience **Dr. Steven Small**, who helped guide the effort to create the unit, said that the new unit will serve researchers across BBS.

"It's not something that benefits any single research cohort," he said. "Within neuroscience, audiology, bioengineering and psychology there are active groups doing drug discovery and repurposing work, as well as developing therapeutic devices. Add in the studies of behavioral interventions under investigation across BBS — concerning autism, language disorders, PTSD, early parent-child relationships, among others — this serves the entire school and beyond."

Dr. Colleen Le Prell, Emilie and Phil Schepps Professor of Hearing Science and department head of speech, language, and hearing in BBS, is the Clinical Trials Unit's founding director. She described the initiative as "a real opportunity for UT Dallas to be a leader."

"I've been interested in building the infrastructure necessary for doing applied clinical research here at UT Dallas, and in my own field of hearing science, efforts have

"This is the missing piece that can take our basic discovery work and move it through to patient application."
Dr. Colleen Le Prell

The Clinical Trials Unit will open initially at the Callier Center Richardson facility.

exploded recently to develop drugs for either hearing protection or regeneration," she said.

Le Prell said that the center can help UT Dallas complete more of the "bench to bedside" research pathway.

"UT Dallas is very highly regarded for the bench part, but we haven't necessarily had many people who are able to bring things fully through a developmental cycle to get to patients and to the larger community," she said. "This is the missing piece that can take our basic discovery work and move it through to patient application."

Dr. Greg Dussor, Eugene McDermott Professor and neuroscience department head, said that access to an on-site clinical trial facility will allow UT Dallas researchers to take ideas from cell culture to humans right here at the University.

"The ultimate goal of the preclinical work that we do at UT Dallas is to develop novel therapeutics for headache and other types of pain," he said. "This naturally requires testing in humans. This facility will provide the expertise and infrastructure to conduct clinical trials on campus."

Initial staffing will focus on experts needed for the center's infrastructure who will help write grants and design, launch and conduct clinical trials, and navigate the Food and Drug Administration approval process.

"Acquiring people who know the FDA's rules and requirements is probably the single most important part of this," Le Prell said.

The Unit will reside at the Callier Center for Communication Disorders' Richardson campus. **Angela Shoup BS'89, MS'92, PhD'94**, the Ludwig A. Michael, MD executive director of the Callier Center, sees the new project as crucial for the exploration at the core of Callier's purpose.

"As part of our mission to transform the lives of individuals with communication disorders, we are committed to conducting meaningful and innovative basic and applied research into new treatments and technologies," she said. "Driving clinical innovation in all areas of brain and behavior requires dedicated resources to move foundational research through clinical testing, implementation and into sustained general practice — thus improving healthcare efficacy and efficiency while setting a new standard of care."

Le Prell said that success for the initiative will be gauged by the number of faculty who lead clinical trials that use CTU facilities and personnel, the quantity of submitted and funded clinical trial grants, and the associated money awarded. With growth of center personnel, the development of new educational programs linked to the center is anticipated and enrollment in those programs will be an additional metric for success.

Research Capsules

Dr. Kristen Kennedy teamed with Dr. May Yuan of the School of Economic, Political and Policy Sciences to investigate whether frequent use of the spatial navigation region of the brain might help fend off the onset of Alzheimer's disease, a form of dementia that affects nearly 6 million Americans.

Kennedy and Yuan published a study in the February 2023 print edition of *The Journal of Prevention of Alzheimer's Disease* that examined data on more than 22,000 patients from the National Alzheimer's Coordinating Center.

"Our hypothesis is that if you navigate spatially complicated environments for most of your life, you're firing the brain cells in your hippocampal formation that make cognitive maps," said Kennedy, of UTD's Center for Vital Longevity. "If you live in a one-stop-sign town, you don't normally practice and experience this. As a result, you're not preserving those brain circuits."

Based on the geographical complexity of each ZIP code, a neural network model could predict whether residents were more likely to be cognitively normal or have a high incidence of Alzheimer's. The strongest features of the Alzheimer's-inclined zones included longer average street length, higher circuity and fewer points of interest.

Kennedy said two major behaviors mark early Alzheimer's: memory problems and getting lost.

"We're telling the rest of the field, 'Here's some evidence that shows we're onto something. Please go test this theory,'" she said. "I'm so excited about it."

A team led by **Dr. Meghan Swanson** has found that parents who talk more to their infants improve their babies' brain development in the first two years of life, in turn enhancing long-term language progress.

The team from the Infant Brain Imaging Study (IBIS), a National Institutes of Health-funded project involving eight universities and clinical sites, performed fMRI on several areas of the brain's white matter, focusing on developing neurological pathways.

Researchers measured the freedom or restriction of water movement in various white-matter regions of the brain and found that infants who heard more words had lower fractional anisotropy values, indicating that their white matter was slower to develop. These children went on to have better linguistic performance when they began to talk.

They found that the arcuate fasciculus region is essential to producing and understanding language.

"This paper is a step toward understanding why children who hear more words go on to have better language skills and what process facilitates that mechanism," Swanson said. "Ours is one of two new papers that are the first to show links between caregiver speech and how the brain's white matter develops."

Swanson said parents can help their children develop by providing knowledge and skills.

"This work highlights parents as change agents in their children's lives, with the potential to have enormous protective effects," Swanson said. "I hope our work empowers parents with the knowledge and skills to support their children as best they can."

Dr. Gregory Dussor of the Center for Advanced Pain Studies has found a mechanism that could help explain why compounds that generate nitric oxide, such as nitroglycerin, cause migraines.

"We've known for a long time that when you give migraine patients a compound that generates nitric oxide, it triggers a migraine attack in a very large number of them," he said. "It's one of the first pharmacological migraine triggers ever documented, and it's a robust, consistent phenomenon. But the mechanism is unclear. If we discover what it is, we might have a good drug target."

Nitroglycerin is a vasodilatory drug that relaxes blood vessels. Inhibiting production of nitric oxide raises blood pressure, ruling it out as a pharmaceutical solution. So researchers exposed mice to two common triggers of migraine in humans and found that

peroxynitrite was responsible for the development and maintenance of pain-like hypersensitivity in a preclinical model of migraine.

The male mice exhibited a higher level of mitochondrial dysfunction than did the female mice.

Peroxynitrite gives researchers another therapeutic angle to explore. Dussor believes that migraine is much more diverse than the "with or without aura" distinction that science currently employs.

"I don't think that there will ever be a drug that works for all people with migraine," he said. "Until we know better which type a person has, it's hard to know what therapeutic to give that person."

A new study from **Dr. Kendra Seaman** and colleagues at four other universities in the May print issue of the journal *Neurobiology of Aging* compared how older and younger adults learn to trust other people, shedding light on why older adults fall for financial scams more frequently.

In the study, participants played a trust game to measure social associative learning while undergoing functional MRI. They were graded on whether they learned from their investing experience and adapted their choices. The learning effect was blunted in older adults.

"We came in expecting to find that the older participants would rely more on positive feedback," Seaman said. "Instead, the results suggest that older adults vary in the ways they use social cues to make assessments."

The study suggests that scientists should re-examine some assumptions they make about older adults, Seaman said.

"Positivity bias posits that older adults tend to remember and act on positive information more than negative or neutral information," Seaman said. "What we found is that paying more attention to positive than negative feedback doesn't relate to age."

Seaman said that previous research has shown that some older adults rely on their initial impressions of faces and fail to learn when their initial bias is contradicted.

"At its core, this is a learning task, and sometimes, older adults don't need to learn as well because they have a lifetime of prior experiences they can rely on," Seaman said. "Indeed, it may be their accumulated experience that prevents older adults from learning in this kind of situation."

Dr. Benedict Kolber published a paper in the journal *Biological Psychiatry* documenting lateralization in the amygdala in the context of chronic pain. His imaging study in mice analyzed one neuropeptide that has opposite effects on chronic bladder pain when active in matching regions of opposite hemispheres of the brain.

"This finding is particularly striking — it's flip sides of the same coin," Kolber said. "It speaks to the flexibility of natural systems."

The protein calcitonin gene-related peptide (CGRP) administered in the right side of the animals' amygdalae increased behavioral signs of bladder pain, but in the left side, it decreased painlike behavior.

"There are other examples in the amygdala of situations in which one side has a specialized receptor that increases pain, and the other side doesn't do anything. But none with counteractive effects like this," Kolber said. "CGRP is driving pain on the right side and reducing pain on the left."

Kolber said there have probably been hundreds of studies that went unpublished by researchers who moved on because they assumed there was no difference between hemispheres. He said his group's results could enable progress in research on other medical conditions, including stroke, depression, and some learning and memory phenomena.

"We're discovering something about nature, something fundamental. That's really exciting," he said. "Chronic pain treatments are often ineffective largely because we still don't truly understand the underlying mechanisms. Understanding these pain pathways will hopefully help us design effective therapeutics in the future."

Dr. Michael Burton published a study in *Scientific Reports* suggesting that short-term exposure to a high-fat diet in mice may be linked to pain sensations in the absence of an injury or preexisting condition like obesity or diabetes.

The study compared the effects of eight weeks of different diets on two mouse cohorts. One received normal chow while the other was fed a high-fat diet in a way that did not precipitate obesity or high blood sugar.

The researchers found that the high-fat diet induced hyperalgesic priming — a neurological change that represents the transition from acute to chronic pain — and allodynia, which is pain resulting

Research Capsules *continued*

from stimuli that do not normally provoke pain.

"This study indicates you don't need obesity to trigger pain; you don't need diabetes; you don't need a pathology or injury at all," Burton said. "Eating a high-fat diet for a short period of time is enough. This is the first study to demonstrate the influential role of a short exposure to a high-fat diet to allodynia or chronic pain."

Burton and his team found that palmitic acid, the most common saturated fatty acid in animals, binds to a particular receptor on nerve cells, a process that results in inflammation and mimics injury to the neurons.

"The mechanism behind this transition is important because it is the presence of chronic pain — from whatever source — that is fueling the opioid epidemic," he said. "If we figure out a way to prevent that transition from acute to chronic, it could do a lot of good."

An imaging study authored by **Dr. Alva Tang** and published in *JAMA Psychiatry* has identified early risk factors in children for developing depression and anxiety in adolescence and early adulthood.

People who are more inhibited in early childhood who don't respond typically to potential rewards as adolescents are particularly vulnerable to developing depression later in life.

"The findings highlight different mechanisms in the brain and relate them to who is at greater risk for developing different mental health issues," Tang said. "These results could inform the development of prevention-oriented treatments tailored to the individual."

Tang's research is unique for its characterization of the subjects' early temperamental risks and the protracted length of time they were studied — from 4 months old through age 26.

"To show any relation with increases in depressive symptoms over time, we have to follow subjects for decades because full-blown syndromes usually do not emerge until young adulthood," she said.

As young children, the subjects were categorized as either inhibited or uninhibited based on reactions — approaching or avoiding — to novel objects. As adolescents, they underwent functional MRIs while completing a task to measure their brains' reaction in anticipating a monetary reward.

Some study participants showed a blunted response in the ventral striatum, a brain region well studied in adult depression. The researchers found that the association between inhibition before age 2 and worsening depressive symptoms from ages 15 to 26 was present only among those who also showed blunted ventral striatum activity as adolescents.

An April study published in *Neuroscience* by **Dr. Chandramallika Basak** supports the idea that the brains of older adults who maintain physical fitness by engaging in regular strenuous exercise more closely resemble those of younger adults.

The paper describes how strenuous physical activity and cardiorespiratory fitness help the brains of older adults compensate for age-related changes, demonstrating the importance of maintaining physical fitness to prolong neurological health.

"Age is just one marker for cognitive health, and fitness can be a significant modifying factor," Basak said. "Our findings suggest that

cardiorespiratory fitness and a lifestyle involving a level of physical activity that actually gets your heart rate up and increases your lung capacity may help maintain cognitive processing in the prefrontal cortex and posterior brain regions of older adults."

The researchers used functional MRI to measure fluctuations in blood oxygen level-dependent signals as the 52 study participants performed complex cognitive control tasks that involved remembering two sets of numbers presented against two different colored backgrounds. The study compared high-fit and low-fit older adults with a median age of 73 to younger participants with an average age of 26.

The study's results show that the CRUNCH model describing older adults engaging more neural circuits than young adults due to declining neural efficiency doesn't apply to all aging adults.

"We found protective effects in those subjects who regularly engaged in strenuous activity and exhibited high cardiorespiratory fitness, which compensates for the decline of cognition we normally see with age," Basak said. "Our results suggest that the CRUNCH model needs to be modified to take into account the protective effect of physical fitness on the aging brain."

Selected Grants

Dr. Amy Pinkham received the 2022 Research Harmonisation Award from the Schizophrenia International Research Society to convene a worldwide research team to determine cross-cultural ways of measuring social cognition in schizophrenia patients.

For patients affected by psychosis, social cognition relates strongly to functional outcomes. Improving how well a patient understands the world and people around them in turn improves their day-to-day life.

"Social cognition is the process by which you understand other people. The problem is that we still don't have a great universal measure," Pinkham said. "We need to find a way to measure this in comparable ways across cultures where there are differences in norms and expectations."

Emotion recognition and mentalizing are two core aspects of social cognition. To measure the former, researchers show subjects pictures of someone's face or a video of somebody expressing emotion. The latter, the ability to understand behavior in terms of intentions or mental states, is assessed via hinting tasks. Such a test may involve a story about an exchange between two people with questions at the end asking about the subtext of what someone said or hinted at.

Members of Pinkham's team represent seven countries and a wide range of career stages. They also include two experiential experts — people with lived experience as consumers of mental health services who advocate for individuals with mental illness.

"We're not setting out to design a new measure. Instead, we are surveying a wide range of researchers on what they think is the best current measure; what might be a suitable, translatable measure; and what biggest hurdles need to be tackled," Pinkham said.

Dr. Gagan Wig received a pilot grant from the National Institutes of Health to develop a mouse model of the social factors that are believed to affect aging humans' susceptibility to neurological diseases, tracing the progression of neurological disorganization in the aging brain with the hopes of isolating the specific variables that modulate such conditions.

"We know that environmental and social factors contribute to age-related cognitive decline and brain disease, but it's difficult to untangle in humans what the exact crucial exposures are," Wig said. "Links between social adversity, health and mortality exist in other social mammals."

Rodent models are a powerful tool because of the animals' relatively short lifespans and because their environments can be carefully measured, controlled and altered in experiments.

"With mice, we can look at exposures and outcomes in a way that you cannot in humans," he said. "You can closely examine and in some cases even alter exposures early on — socialization, diet, sleep, exercise and stress. We can examine the impact of certain exposures at various times during their two- to three-year lifespan."

Wig and his team will use existing functional brain-imaging data to first confirm that brain network organization in mice can be measured in a similar way as in humans, then to evaluate whether analogous brain network changes exist in aging mice. The goal is to be able to identify health and lifestyle factors that can slow down progression of age-related brain disease, such as Alzheimer's.

Dr. Kelly Jahn received funding from the US Army to elucidate the mechanisms behind hyperacusis — abnormal sensitivity to everyday sounds like clashing dishes, vacuums or honking cars, especially in people with autism spectrum disorder. The grant will support her search for biomarkers of the condition, with hopes to eventually develop ways to monitor its symptoms.

"Hyperacusis occurs in people with little to no measurable hearing loss. Some people suffer physical pain. It makes it hard to go about daily life," she said. "We've never been able to identify a mechanism in humans, but there are studies in animals that show that when you damage the auditory system in some way, you get enhanced responses to sound."

Jahn's team plans to collect data from four cohorts, each ranging in age from 18 to 35: autistic and non-autistic young adults with and without hyperacusis.

"We will record brain waves via EEG, pupil size changes and sweat secretions, looking for similar hyperactivity to what we see in animal models," she said. "Perceptions of loudness and emotional response will also be recorded."

As a licensed audiologist, Jahn has met many people for whom there's no current solution. Complicating understanding of hyperacusis is the range of conditions that are connected to sound sensitivity, including tinnitus, PTSD, migraines and traumatic brain injury. This motivates her push for an objective diagnostic measure.

"Sound is such a complex stimulus, but I am optimistic that someday we will devise a pharmacological intervention for the pain component," Jahn said.

Pinkham

Wig

Jahn

See all active research grants at ***utd.link/grants23***

Selected Publications from the 2022-2023 Academic Year

Basak, Chandramallika: Qin, S., & Basak, C. (2022). Fitness and arterial stiffness in healthy aging: Modifiable cardiovascular risk factors contribute to altered default mode network patterns during executive function. *Neuropsychologia, 172,* 108269.

Behroozmand, Roozbeh: Behroozmand, R., Sarmukadam, K.*, & Fridriksson, J. (2023). Aberrant modulation of broadband neural oscillations reflects vocal sensorimotor deficits in post-stroke aphasia. *Clinical Neurophysiology*.

Burton, Michael: Tierney, J.A., Uong, C.D., Lenert, M.E., Williams, M., & Burton, M.D. (2022). High-fat diet causes mechanical allodynia in the absence of previous injury or diabetic pathology. *Scientific Reports, 12*(1).

D'Mello, Anila: LeBel, A., & D'Mello, A. M. (2023). A seat at the (language) table: Incorporating the cerebellum into frameworks for language processing. *Current Opinion in Behavioral Sciences, 53,* 101310.

Engineer, Crystal: Borland, M. S., Buell, E. P., Riley, J. R., Carroll, A. M., Moreno, N. A., Sharma, P., Grasse, K. M., Buell, J. M., Kilgard, M. P., & Engineer, C. T. (2023). Precise sound characteristics drive plasticity in the primary auditory cortex with VNS-sound pairing. *Frontiers in Neuroscience, 17,* 1248936.

Hart, John Jr.: Dugas, C., Keltner-Dorman, E., & Hart, J. (2022). Differential effects from cognitive rehabilitation and high-definition tDCS in posterior cortical atrophy: A single-case experimental design. *Neuropsychological Rehabilitation, 32*(7), 1620-1642.

Huxtable-Jester, Karen: Cruz, L., Huxtable-Jester, K., Smentkowski, B., & Springborg, M. (2021). Place-based educational development: What center for teaching and learning spaces look like (and why that matters). *To Improve the Academy: A Journal of Educational Development, 40*(1).

Jahn, Kelly: Jahn, K. N., & Polley, D. B. (2023). Asymmetric hearing thresholds are associated with hyperacusis in a large clinical population. *Hearing Research, 437,* 108854.

Katz, William: Kumar, H. G., Lawn, A. R., Prabhakaran, B., & Katz, W. F. (2022). Opti-Speech-VMT: Implementation and Evaluation. In M. Ur Rehman & A. Zoha (Eds.), *Body Area Networks. Smart IoT and Big Data for Intelligent Health Management. BODYNETS 2021. Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering* (Vol. 420).

Kennedy, Kristen: Yuan, M., & Kennedy, K. M. (2023). Utility of environmental complexity as a predictor of Alzheimer's disease diagnosis: A big-data machine learning approach. *Journal of Prevention of Alzheimer's Disease, 2*(10), 223-235.

Kilgard, Michael: Souza, R. R., Powers, M. B., Rennaker, R. L., McIntyre, C. K., Hays, S. A., & Kilgard, M. P. (2022). Timing of vagus nerve stimulation during fear extinction determines efficacy in a rat model of PTSD. *Scientific Reports, 12*(1), 16526.

Kolber, Benedict: Allen, H. N., Chaudhry, S., Hong, V. M., Lewter, L. A., Sinha, G. P., Carrasquillo, Y., Taylor, B. K., & Kolber, B. J. (2023). A parabrachial-to-amygdala circuit that determines hemispheric lateralization of somatosensory processing. *Biological Psychiatry, 93*(4), 370-381.

Le Prell, Colleen: Le Prell, C. G. (2022). Prevention of noise-induced hearing loss using antioxidants and other drug agents: Previous trial outcomes should inform future trial design. *Antioxidants and Redox Signaling, 36*(16-18), 1171-1201.

Lee, Yune: Kim, H-W., Happe, J., & Lee, YS. (2023). Beta and gamma binaural beats enhance auditory sentence comprehension. *Psychological Research, 87,* 2218–2227.

Lobarinas, Edward: Trevino, M., Escabi, C., Swanner, H., Pawlowski, K., & Lobarinas, E. (2022). No reduction in the 226-Hz probe tone acoustic reflex amplitude following severe inner hair cell loss in chinchillas. *JARO: Journal of the Association for Research in Otolaryngology, 23*(5), 593-602.

Maguire, Mandy: Denicola-Prechtl, K., Abel, A., & Maguire, M.J. (2023). What do children's errors tell us about the strategies used during a word inferencing task? *Journal of Experimental Child Development*.

Mills, Candice: Sands, K. R., Monroe, A. J., & Mills, C. M. (2023). "How do fish breathe underwater?" Young children's ability to evaluate and remember different types of explanations regarding biological phenomena. *Cognitive Development, 66,* 101330.

Nelson, Jackie: Nelson, J. A., *Hafiz, M., *Compton, C. L., & Villarreal, D. L. (2023). Household chaos and mother-adolescent communication. *Journal of Family Psychology, 37,* 547–553.

Owen, Margaret: Owen, M. T., Dyer, N., Pacheco, D., Barnes, J. C., Von Hatten, L., & Caughy, M. O. (2023). Stability of parenting profiles in early childhood among African American mothers experiencing poverty. *Early Childhood Research Quarterly, 65,* 295-305.

Pinkham, Amy: Nagendra, A., Liu, C. W. J., Mueser, K. T., Harvey, P. D., Depp, C. A., Moore, R. C., ... & Pinkham, A. E. (2023). Do symptom severity, individual socioeconomic status, and neighborhood socioeconomic status explain differences in daily functioning in Non-Latinx Black, Non-Latinx White, and Latinx people with serious mental illnesses? *Clinical Psychological Science*.

Rollins, Pamela: De Froy, A., & Rollins, P. R. (2023). The cross-racial/ethnic gesture production of young autistic children and their parents. *Autism and Developmental Language Impairments, 8,* 1-8.

Seaman, Kendra: Seaman, K. L., Christensen, A. P., Senn, K. D., Cooper, J. A., & Cassidy, B. S. (2023). Age-related differences in the social associative learning of trust information. *Neurobiology of Aging, 125,* 32-40.

Shembel, Adrianna: Shembel, A. C., Morrison, R. A., Fetzer, D. T., Patterson-Lachowicz, A., McDowell, S., Comstock Smeltzer, J. C., & Mau, T. (2023). Extrinsic laryngeal muscle tension in primary muscle tension dysphonia with shear wave elastography. *The Laryngoscope.*

Shoup, Angela: Kettler, M., Shoup, A., Moats, S., Steuerwald, W., Jones, S., Stiell, S. C., & Chappetto, J. (2023). American Academy of Audiology Position Statement on Early Identification of Cytomegalovirus in Newborns. *Journal of the American Academy of Audiology.* Advance online publication.

Stankovic-Ramirez, Zlata: Stankovic-Ramirez, Z., & Vittrup, B. (2023). Prekindergarten teachers' perspectives on classroom environments and barriers to optimal learning spaces. *Early Childhood Educ J.* Advance online publication.

Su, Pumpki Lei: Sheng, L., Yu, J., Su, P. L., Wang, D., Lu, T. H., Shen, L., ... & Lam, B. P. W. (2023). Developmental language disorder in Chinese children: A systematic review of research from 1997 to 2022. *Brain and Language, 241,* 105268.

Tang, Alva: Tang, A., Fox, N.A., Slopen, N. (2022). Examination of early childhood temperament of shyness and social avoidance and associations with cardiometabolic health in young adulthood. *JAMA Network Open, 5*(1), e2144727-e2144727.

Thibodeau, Linda: Qi, S., & Thibodeau, L. (2023). Verification of EasyGain settings in the Roger remote microphone system. *American Journal of Audiology, 22,* 1-12.

Warner-Czyz, Andrea: Shin, S., Warner-Czyz, A., Geers, A., & Katz, W. F. (2022). Speaking rate, immediate memory, and grammatical processing in prelingual cochlear implant recipients. *Journal of Speech, Language, and Hearing Research, 65*(12), 4637-4651.

See more faculty achievements from the past year at ***utd.link/faculty23***

New Tenure-Track Faculty


Behroozmand

STARTED AUGUST 1, 2023

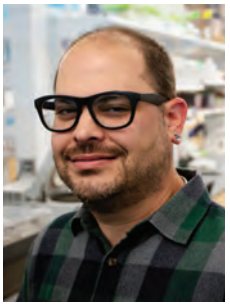
Roozbeh Behroozmand
Associate Professor of Speech, Language, and Hearing

Education: PhD, Communication Sciences and Disorders, Northwestern University, Evanston, IL; MS, Biomedical Engineering, Amirkabir University of Technology, Tehran, Iran; BS, Electrical Engineering, University of Tehran, Tehran, Iran
Research areas: Neuroscience of speech production and sensorimotor control with focus on identifying behavioral, neurophysiological (EEG), and neuroimaging (fMRI) biomarkers of speech disorders in neurological conditions including Parkinson's disease and post-stroke aphasia

STARTING JANUARY 1, 2024

Jennifer L. Callahan
Professor of Psychology

Education: PhD and MS, Clinical Psychology, University of Wisconsin-Milwaukee; BA, Psychology, University of Jamestown
Research areas: Improving psychological services and outcomes among underserved and disadvantaged populations by elucidating contributing patient and provider variables, as well as the role of training and supervisors, and by understanding distress and resiliency following exposure to trauma


Eagle

Andrew Eagle
Assistant Professor of Neuroscience

Education: PhD, Experimental Psychology, Central Michigan University; BA, Psychology, Central Michigan University; AA, Psychology, Delta College
Research areas: Neurobiology of addiction and stress, neuronal pathways underlying depression and addiction, focusing on the hippocampus and entorhinal cortex


Guo


Gu

Zirong Gu
Assistant Professor of Neuroscience

Education: PhD, Molecular and Developmental Biology, University of Cincinnati
Research areas: GABAergic basal ganglia output interactions with other brain regions, using single-cell methods, viral tracing, brain-wide circuitry mapping, behavioral clustering, Calcium-light tagging and optogenetic manipulation; identifying therapeutic targets for psychiatric and neurodegenerative diseases, including compulsive disorder and Parkinson's

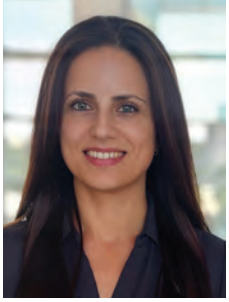
Jiahui Guo
Assistant Professor of Cognitive Neuroscience

Education: PhD, Cognitive Neuroscience, Dartmouth College; BS, Psychology, Beijing Normal University
Research areas: Using neuroimaging methods, behavioral measurements, computational modeling, machine learning algorithms and deep neural networks to study human high-level perception and cognition in both typical and neuropsychological populations; how people perceive and process high-level information and accomplish complex real-world cognitive tasks

Noa Ofen
Professor of Psychology

Education: PhD, Cognitive Neuroscience, Weizmann Institute of Science, Rehovot, Israel; BA, Psychology, Honors, University of Haifa, Israel
Research areas: brain development across the lifespan from childhood to adulthood; cognitive development; human memory; the neurological basis of memory, perception, and cognitive control; spatiotemporal dynamics of brain function; brain rhythms; intracranial EEG; functional MRI; high-resolution imaging of the human hippocampus; genetic and environmental influences on cognitive and brain development


Ofen



Tavares-Ferreira

Camilo Ruggero
Professor of Psychology

Education: PhD and MS, Clinical Psychology, University of Miami; BA, Plan II Honors, University of Texas at Austin; internship and postdoctoral fellowship, Brown University
Research areas: Assessment, phenomenology and modeling of psychopathology; eHealth to reduce behavioral health disparities

Diana Tavares-Ferreira
Assistant Professor of Neuroscience

Education: PhD, neuroscience, University of Sheffield, UK; PharmD/MS, pharmaceutical sciences, University of Coimbra, Portugal
Research areas: Cellular and molecular mechanisms of axonal integrity; studying the role of RNA transport and non-coding RNAs in neuropathies and neurodegenerative diseases using multi-omics and computational approaches

Leehyun Yoon
Assistant Professor of Neuroscience

Education: PhD, Psychology, Korea University, Seoul, South Korea; BS, Psychology and Philosophy, Korea University
Research areas: Neurodevelopmental and environmental mechanisms of (1) self-belief update and self-esteem protection in social and performance contexts, (2) adaptive and maladaptive internally oriented cognitions (e.g., rumination, social memory), (3) social competence and social learning, and (4) the emergence of depression and maladaptive cognitions in youth

Yoon

New Non-Tenure-Track Faculty

STARTED MARCH 20, 2023

Meg Flanigan
Professor of Instruction in Psychology and Assistant Dean of Assessment and Curriculum

Education: PhD, Physiology, University of the Witwatersrand Medical School, Johannesburg, South Africa; BS, Biochemistry, University of Strathclyde, Glasgow, Scotland
Research areas: Biopsychosocial interactions between sleep and mental health and illness, supporting and encouraging student learning and well-being, course and program assessment and development

Flanigan

STARTED AUGUST 1, 2023

William Marks
Assistant Professor of Instruction in Neuroscience

Education: PhD, Neuroscience, Virginia Commonwealth University; MA, Biology, State University of New York College at Buffalo; BS, Biology, Minor Psychology, Franciscan University (Steubenville, OH)
Research areas: Neurovirology and neuroinflammation, HIV associated neurocognitive disorders, Learning and memory, Circuit physiology, Electrical synapses

Marks

Zlata Stanković-Ramirez
Assistant Professor of Instruction in Psychology

Education: PhD and MS, Child Development and Early Education, Texas Woman's University; BA, Psychology, Southern Methodist University
Research areas: Child development and early childhood education

Amy Zwierzchowski-Zarate
Associate Professor of Instruction in Neuroscience

Education: PhD, Biomedical Sciences and Neuroscience, UT Southwestern Medical Center; MS, Applied Cognition and Neuroscience, The University of Texas at Dallas; BS, Neuroscience, The University of Texas at Dallas
Research areas: Mechanisms that drive tau protein between innocuous and pathogenic states, mechanisms underlying etiology of neurodegenerative diseases such as Alzheimer's disease

Zwierzchowski-Zarate

Notable Awards and Prizes

Brody

Sultana

Dr. Salena Brody, a professor of instruction in psychology, joined the UT System's Academy of Distinguished Teachers, which recognizes extraordinary educators throughout the eight UT System academic institutions.

The academy was created in 2012 to advocate at the system level for innovation in the classroom, interdisciplinary perspectives on education and sharing of best practices. Prospective fellows must previously have received a UT System Regents' Outstanding Teaching Award, an honor Brody received in 2022.

Brody, who joined UT Dallas in 2005, also received the President's Teaching Excellence Award in Undergraduate Instruction from UTD in 2022 and the Aage Møller Teaching Award from the School of Behavioral and Brain Sciences in 2021.

Her research interests include intergroup contact, cross-group friendships and prejudice reduction.

Associate professor of instruction in neuroscience **Dr. Rukhsana Sultana** received the 2023 Aage Møller Teaching Award.

The award was established by Møller in 2011 to promote and recognize outstanding teaching. It is given based on nominations by the faculty's peers and students.

Sultana arrived at UT Dallas in 2017 and has taught various neuroscience courses to both undergraduate students and master's students.

Recent psychology doctoral graduate **Desiree Jones MS'20 PhD'23** was named to the 2023 30 Under 30 for Science list by *Forbes* magazine.

The publication selects 600 honorees annually who represent the brightest members of the next wave of leaders and entrepreneurs across 20 fields.

Jones studies how the lives of autistic people are affected by the perceptions and biases of their peers, as well as stigmas faced by autistic individuals. She said that reducing negative societal perceptions of autistic people can improve their interactions and outcomes, but it will require better educating the public about autism.

A team of six UTD students out-thought and bested their opponents in the **2023 Brain Bowl**, a quiz bowl-style, neuroscience competition held April 11 at the UT Health Science Center at San Antonio.

The Brain Bowl covered topics including neurophysiology, neuroanatomy, brain and behavior, neurochemistry, and drugs and the brain. The contest consisted of three rounds of buzzing in to answer questions, then a final wager-based challenge question.

The UTD team included neuroscience seniors **Grace Moore**, **Landon Norman** and **Anirudh Rayanki**, and neuroscience junior **Aryan Verma**; biology senior **Rohan Jupelly** and biochemistry junior **George Kidane**.

Dr. Rukhsana Sultana, associate professor of instruction in neuroscience in the School of Behavioral and Brain Sciences, helped prepare the team for the event.

The City of Dallas proclaimed May 2023 as Better Hearing Month, thanks to the work of AuD student **Lindee Alvarez**, the president-elect of the National Student Academy of Audiology, and her colleagues at the Callier Center for Communication Disorders.

The proclamation from Dallas Mayor Eric L. Johnson saluted local audiologists and speech-language pathologists "who dedicate themselves every day to improving the lives of clients, patients, and students."

Brain Bowl

Jones

Alvarez (center)

Lectures and Events


Dr. Travis Rieder

Guest Speaker Discusses Opioid Addiction

Dr. Travis Rieder, author of *In Pain: A Bioethicist's Personal Struggle with Opioids*, was a special guest of the Center for Advanced Pain Studies (CAPS) in May.

Rieder is a member of the faculty at the Berman Institute of Bioethics at Johns Hopkins University. *In Pain* is a memoir of Rieder's experience with pain, opioid dependency and withdrawal following a 2015 motorcycle accident. NPR named the book to their 2019 list of Books We Love.

He began his visit to campus speaking with students about his career and the experiences that led him to write the memoir.

BBS Advisory Council member **Nancy O'Neil** and **John Q. Stilwell JD, PhD** then hosted a full house of friends and supporters for a reception with the author, which featured a Q&A between Rieder and **Dr. Ted Price,** CAPS director.

"The event highlighted how critical it is to bring non-opioid pain treatments to the clinic, a major mission of CAPS. It was remarkable to see how attendees immediately connected Dr. Rieder's remarkable story to the need for different ways to manage pain," said Price.

The following day, Rieder delivered a public talk in the Davidson-Gundy Alumni Center. Student researchers and faculty presented posters of their research during the post-talk reception.

BBS and CAPS gratefully acknowledge the donors whose support made these events possible, O'Neil and Stilwell for sharing their home, and Interabang Books for serving as the bookstore partner for these events.

Dallas Aging and Cognition Conference

The seventh biennial Dallas Aging and Cognition Conference, sponsored by the Center for Vital Longevity, BBS, the Office of the Provost and the Office of Research and Innovation, drew cognitive neuroscientists from across the world to the three-day event at the HALL Arts Hotel in the Arts District.

Researchers representing 48 institutions in Germany, Norway, Ireland, Canada and the United States shared the latest scientific findings on aging and cognition through a series of talks and poster presentations. The keynote address was given by **Dr. Kristine Beate Walhovd** from the University of Oslo. She presented "Set to Change? Lifespan Factors Influencing Brain and Cognition."

Travel awards were given to 47 graduate students and post-doctoral students to support their registration and travel. Funds for the awards are provided by the Sallie P. Asche Travel Assistance Fund and the Pomberg and Hammer Family Opportunity Fund.

"After postponing the event for three years, it was wonderful to see mentors, friends, and colleagues together again, and it serves as a reminder of the critical role the DACC plays in the field of lifespan cognitive neuroscience," said CVL Director Dr. Michael Rugg.


Walhovd

For more information on upcoming BBS events, visit ***bbs.utdallas.edu/events***

Alumna Helps Turn the Tables on Kids' Communication Challenges

Courtney Willis BS'06, MS'12 is helping children with speech and language disorders find their voices and turn the tables on their communication challenges by teaching them how to be DJs.

Launched by Willis and DJ **Jay Clipp** in 2020, Spin the Spectrum is the only program of its kind in the country that helps children with communication disorders, including autism, express themselves and regulate their emotions through DJ education, she said.

"For kids on the autism spectrum, DJing is soothing emotional regulation," said Willis, who graduated from The University of Texas at Dallas with a Bachelor of Science in Speech-Language Pathology and Audiology, and a master's degree in communication disorders. "They experience the world in a very different way from you and me. If you're a DJ, you're in charge of your sensory environment, and you're expressing yourself through technology. It's repetitive and soothing."

Willis approached Clipp, founder of Keep Spinning DJ Academy in the Dallas area and a longtime family friend, with the idea of starting Spin the Spectrum after watching a documentary about pioneering hip-hop DJ and rapper Grandmaster Flash.

"In the documentary, he said that the reason he got into DJing was because he was never great socially and preferred working on technology to being around people," she said. "And he said he liked repetitive noises. I'm not diagnosing Grandmaster Flash, but people on the autism spectrum might also fit that description."

The partnership between Willis and Clipp combines his expertise in teaching the techniques behind DJ music mixing and production with her child-directed, evidence-based approach to speech and language therapy. She said there has been no research into the association between learning to DJ and improved speech and language skills for children on the autism spectrum, but she would like to see that change because of what she has experienced with students.

That has included one student whose reading comprehension advanced two grade levels in 2½ weeks. "And, we have a kid with a developmental delay in hand-eye coordination, and he is now within normal limits after doing DJ school for six months," Willis said.

Spin the Spectrum is also becoming a potential place to train people on the autism spectrum who want to work in music production and entertainment. Willis said one student was hired as a DJ for events in North Texas.

Willis and Clipp are considering ways to expand the Spin the Spectrum program and make it available and more accessible to children around the country. When asked for her favorite part of the job, she said it's that she gets to be her patients' very first friend.

"When a kid has a communication disorder, when they can't communicate with the people around them, it's really hard for them to have that first friend. I get to be that friend," said Willis, who also founded the Dallas-based clinic Speech Wings Therapy in 2015, adopted the name from Helen Keller's description of her inability to communicate early in life.

"My approach to working with kids is that they don't need to be repaired; they're not broken. But if their ability to communicate, if their speech wings are weak or broken and have lost all their grace and beauty, then we want to help them soar," Willis said.

Helping Others Understand Life's Struggles

As a student in the School of Behavioral and Brain Sciences, **Annette Addo-Yobo BS'20** endured uncertainty and anxiety.

Driven by her experiences to spread mental health awareness, she competed in a Miss America Organization Scholarship pageant and was crowned Miss Dallas 2023, advancing to the Miss Texas pageant in June. This honor has given her a powerful platform to advocate for at-risk young people and others, like herself, who face depression.

"I was going through the college experience while also being a caretaker for my mom and an advocate for my brother," Addo-Yobo said. "It fell mostly on me to be able to balance everything that my family and I were going through."

Addo-Yobo is now a clinical research coordinator in the outpatient psychiatry department at UT Southwestern Medical Center, which she balances with making appearances as Miss Dallas. Balancing roles comes naturally to her after years of placing others ahead of herself at a young age.

While a student at UT Dallas, Addo-Yobo's mother developed Lewy body dementia, an untreatable disease that affects thinking, memory and motor control.

"My mother was 51 when she passed," Addo-Yobo said. "The amount of strain that comes with being not only a young adult but also a family member's caretaker is difficult. It means having to sacrifice a lot of your youth."

Addo-Yobo also focused on caring for her younger brother who is on the autism spectrum and needs help navigating the world.

"Growing up with my brother, people would say to us, 'He doesn't look autistic.' And I wanted to say, 'Look autistic? What does autism look like?'" Addo-Yobo said. "I want people to understand how unique my brother is and that autism doesn't have a look."

The Miss Texas pageant allowed Addo-Yobo to address a statewide audience about the uniqueness of those with autism. Her spoken-word talent portion addressed society's misunderstanding of the condition.

"I really want to showcase just how unique my brother really is and to teach people that they shouldn't try to put their own biases or assumptions about autism onto those on the spectrum," she said.

Miss Dallas - Annette Addo-Yobo

As Miss Dallas, Addo-Yobo speaks about mental health awareness and her own battle with depression, which began to develop as early as 16 years old.

"It really intensified when I got to college," she said. "Those symptoms from high school were now compounded by family issues like my mom not being well and the challenges of helping my brother."

It was only at UT Dallas that she began to understand her condition, recognizing many of her symptoms in descriptions of depression in classes.

"I remember learning about the criteria for major depressive disorder, and I'm like, 'Wait a minute,'" she said. "Maybe I should talk to someone."

After her depression diagnosis, Addo-Yobo realized the need for advocates to talk about what so many people with the illness face. She gives presentations at schools, local organizations and businesses about the signs and symptoms of mental illness.

"I decided I should try to destigmatize all the negative perceptions of mental illness and find ways to be an advocate instead of being passive about it," Addo-Yobo said.

Addo-Yobo plans to study family law and advocate for young people in the juvenile justice system who never had normal childhoods.

"I think I felt the need to carry so much responsibility because I was the oldest sibling and I wanted so badly to shield my siblings from the weight of the world," she said.

Supporting Inclusive Excellence Through Student Programs: SOAR, SURF and RISE

In March, BBS introduced the Supporting Outstanding Academic Research (SOAR) Award & Symposium, which recognizes outstanding young scholars with underrepresented identities or perspectives and/or research interests in diversity-related issues in brain or behavioral sciences.

The initiative was designed to broaden and deepen the diversity of faculty candidate pools, strengthen BBS's internal commitment to fostering an equitable and inclusive community, and showcase, celebrate and support the faculty and students and their research.

"We received 34 outstanding applicants from advanced doctoral students and postdoctoral scholars whose presentations covered various topics that affect diverse populations," **Dr. Pamela Rollins**, SOAR director. "Those ranged from social interactions to the impacts of language on learning, identity influence enforcement, and trauma-related psychopathology."

The SOAR Award Winner was Ceci Hinojosa, a postdoctoral fellow at Emory University. She thanked the organizers for their work.

"It was a pleasure to visit UT Dallas and to be surrounded by such an amazing community that values diversity in academia," she said.

In June, BBS initiated the Summer Undergraduate Research Fellowship (SURF) Program, which provides college students from groups traditionally underrepresented in science or students from universities where research opportunities are not as widely available with the opportunity to participate in research and training experiences with faculty in labs and clinics.

SURF fellows were fully funded so they could immerse themselves in 40 hours in lab or clinic settings.

"Fellows had the opportunity to work closely with UT Dallas faculty mentors, graduate students, and other SURF Fellows to gain knowledge and experiences that will support them as developing scholars and help them to prepare for future doctoral study," said **Dr. Shayla Holub**, SURF director.

The nine-week program culminated in a poster session highlighting fellows' research projects.

"Students shared that they valued the opportunities to work closely with a research mentor and their research teams, as well as to learn from weekly professional development sessions to prepare for graduate school and to volunteer in our community," Holub added.

The Research Immersion Summer Experience (RISE) Program, which began in July, strives to inspire high school students from historically underrepresented groups to take an interest in neuroscience, psychology or speech, language, and hearing sciences.

Ten students were selected to spend one week on the UT Dallas campus. Each was paired with an undergraduate student mentor. If the program succeeds, it should yield an increase in the number of historically underrepresented students pursuing college majors and careers in related fields.

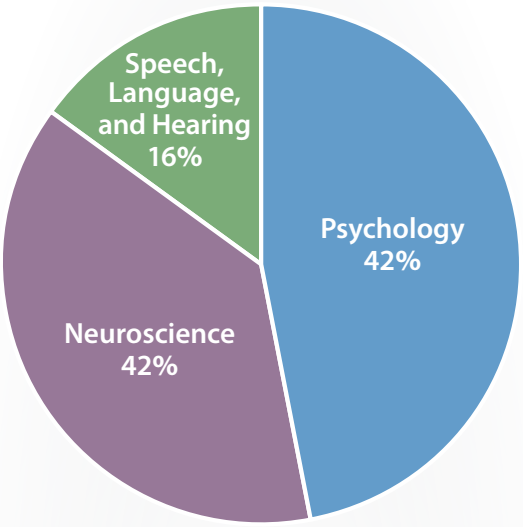
"BBS RISE is a free, five-day program that seeks to open doors for promising high school students from communities underrepresented in the sciences," said **Dr. Christa McIntyre**, RISE director. "We worked with the Richardson Independent School District to offer rising sophomores and juniors a chance to learn about education and research opportunities within BBS at UT Dallas."

Students visited the Callier Center and met with graduate students and faculty.

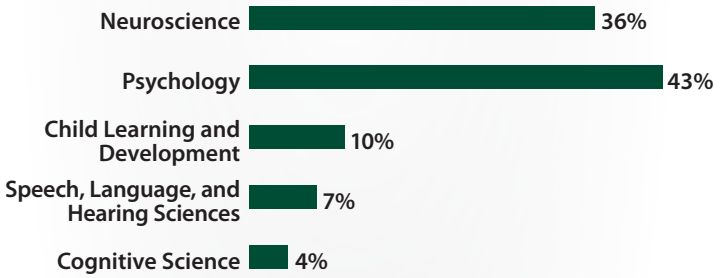
"The students used words like 'inspired,' 'motivated' and 'interested' to describe the effects of the program as they departed on their last day," McIntyre added. "I truly believe we made a positive and lasting impression on them."

BBS Enrollment

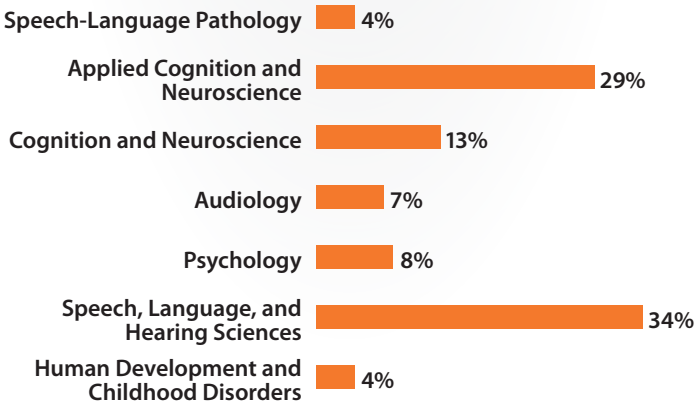
Enrollment by Department



Undergraduate Enrollment by Major



Graduate Enrollment by Major



THE UNIVERSITY OF TEXAS AT DALLAS
School of Behavioral and Brain Sciences

See this report online at
utd.link/annrep23