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THE
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A-TEAM
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UF SCIENTISTS ARE AT THE TOP OF THEIR GAME PAGE 18

THE BRAIN'S A-TEAM

WHEN IT COMES TO BRAIN RESEARCH, UF SCIENTISTS ARE AT THE TOP OF THEIR GAME. MEET A FEW OF THE HEAVY HITTERS IN NEUROSCIENCE.

BY MICHELLE KOIDIN JAFFEE
PHOTOGRAPHY BY AARON DAYE

Diseases of the brain steal: Some steal balance, others memory; some take away the ability to walk, even speak. Some result in a decline that's long and gradual, or heartbreakingly fast. Each condition is devastating in its own way for those afflicted and for all the people who love them.

Dementia, brain cancer, Parkinson's disease, ALS, stroke, dystonia, addiction and the typical cognitive declines that often come with aging are just a few of the threats to the brain. While to date neuroscience has revealed a great deal about how the brain works, it remains a mysterious frontier.

UF researchers have investigated, tested and treated myriad illnesses associated with the brain for decades. But last fall, UF Provost Joe Glover declared the brain to be one of UF's priority initiatives. He offered additional funding to many of UF's cross-disciplinary, brain-related projects and directed scientists to accelerate their studies to offer the public more and improved treatment options.

The following four brain experts are among the many UF scientists, physicians, engineers, microbiologists, pharmacists, nurses and other faculty working on this initiative. In areas of brain research, treatment and the training of up-and-coming brain pioneers, they are UF's heavy hitters.

DUANE MITCHELL

Helping the body destroy tumors from within

GLIOBLASTOMA IS THE DEADLIEST OF BRAIN TUMORS, TYPICALLY CLAIMING ITS VICTIMS IN LESS THAN A YEAR AND A HALF FROM

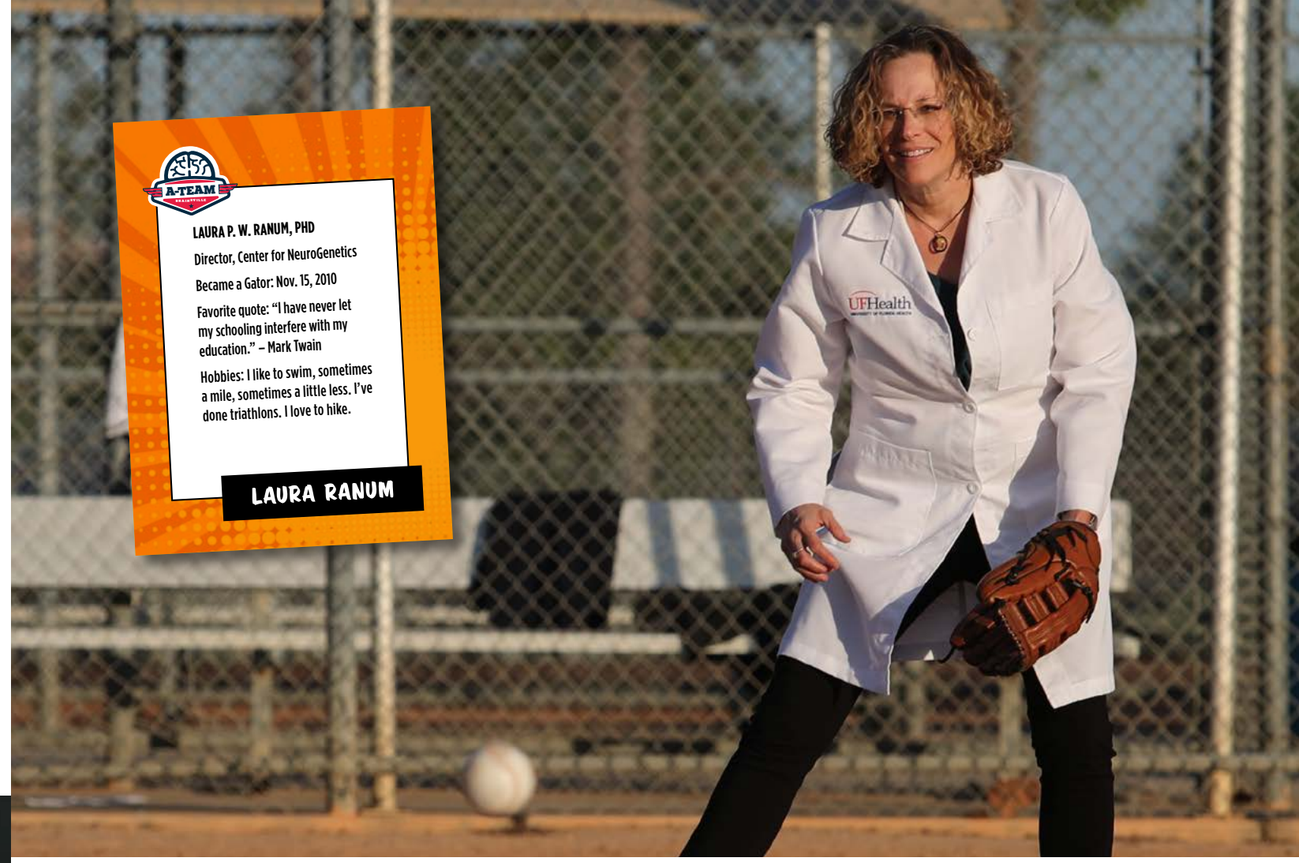
diagnosis. It attacks the young, like Cara Hobbs, a 31-year-old marathoner with two toddlers, and the senior, like 81-year-old Sen. John McCain. Dr. Duane Mitchell is out to stop it.

A trailblazer in the use of immunotherapy for brain tumors, Mitchell brought his team from Duke to UF in 2013, and since then has won national recognition for the results of a clinical trial using an enhanced vaccine credited with significantly extending the lives of multiple glioblastoma patients, including one woman who is now in her 13th year cancer-free. The study, published in the journal Nature, was named as a top 10 paper in clinical and translational science in all of U.S. scientific literature in 2015.

Now, Mitchell's team is pursuing a large Phase 2 clinical trial to confirm the benefits of the vaccine, while also leading new immunotherapy clinical trials for children with malignant brain tumors.

Immunotherapy, which uses the body's own immune system to fight cancer, has proved to be an incredible advance in treating cancers such as melanoma, but hurdles remain in applying the approach to brain cancers. One at a time, Mitchell's team is taking the hurdles down. He is leading the way nationwide with a new UF Health-organized collaboration known as the ReMission Alliance, a first-ever 10-year initiative bringing together neuro-oncology experts from top peer institutions from across the United States and Canada.

"The question that drives us is: How can we best engage the immune system to fight this deadly disease?" says Mitchell. "The ultimate goal is to make a significant contribution that helps cure brain tumors and can be applied to other cancers as well."



LAURA RANUM

Discovering genetic mutations to spur new treatments

WHEN SHE WAS 5, SHE TOOK HER BIKE APART, TO SEE HOW THE CHAIN AND OTHER PIECES WORKED. IT WAS 1965, AND SHE EXPECTED A SCOLDING. "WHO TOOK YOUR BIKE APART?" HER DAD DEMANDED.

"I did," said little Laura.

"Huh," he said. "Maybe you should become a mechanical engineer." It was a first taste of what would become years of encouragement toward a career in engineering or science.

Ranum (pronounced Ran-uhm) took that curiosity in how things work to pursue a career in genetics. Today, she is widely recognized for discovering a series of genetic mutations and an unexpected type of protein production found in neurologic diseases such as ALS, Huntington's disease, ataxia and myotonic dystrophy. Her discoveries inform drug development for these disorders.

Ranum's work has upended longstanding beliefs about how proteins in cells are made; she discovered that in people carrying "repeat expansion mutations" — or long stretches of repeat DNA — cells make unexpected proteins that build up in the brain and can lead to neurodegenerative diseases.

And while her findings were controversial at first, they are now recognized as groundbreaking and, in 2016, earned her the great honor of being named a fellow by the American Association for the Advancement in Science, awarded to those who make distinguished scientific advances.

What drives her?

"I'm just really motivated to figure out the puzzle of genetics," Ranum says. "If you know how a mutation is working to cause disease, then you have the potential of fixing the problem. Today we fundamentally know something very different about how these mutations work, and that may provide an Achilles' heel to treat these disorders."

Editor's note: These busy scientists were great sports to participate in this photo shoot that portrays them as baseball players. However, it wasn't such a stretch for Todd Golde, who played first and third bases in high school. He's proud to have played his entire senior year without making a single error. Michael Okun is a huge baseball fan, too. He follows the Atlanta Braves and New York Yankees.

MICHAEL OKUN

Helping patients manage debilitating symptoms

AT WORK, HE OFTEN PICTURES AN ARTISTIC RENDERING OF A MAN STANDING ATOP A GLOBE, LOOKING

at his watch. To Okun (pronounced Oak-un), the image represents his patients with Parkinson's disease, dystonia and other movement disorders — patients waiting and hoping for better treatments.

It's what drives him to constantly push to develop new approaches, rather than sit and count gains from the last 17 years. Okun, now chair of neurology, and his neurosurgeon-partner Dr. Kelly Foote have become known internationally as pioneers in deep brain stimulation, a therapy remarkably effective at controlling tremors, and have implanted leads in more than 1,000 patients. But between surgeries, they continue to work to refine and improve the technology, while also expanding who can receive it beyond patients with Parkinson's or essential tremor: Okun and Foote have seen life-altering symptom relief in patients with dystonia, Tourette syndrome and obsessive-compulsive disorder.

All the while, Okun is carrying out his overarching vision.

A renowned expert in Parkinson's disease who has cared for patients from across the globe including Muhammad Ali and Janet Reno, Okun co-created with Foote a one-of-a-kind combined clinic-lab in 2011 where patients with movement disorders can see all their potential providers under one roof — neurologist, occupational therapist, speech-language pathologist, social worker, neurosurgeon and more — so the team can collaborate on patient care and also do research into emerging personalized therapies, while the patient only has to go to one location. "The patient is the sun," Okun says, "and we should all orbit around the patient."

With a generous gift in January 2019, what was known as UF's Center for Movement Disorders and Neurorestoration has grown to become the Norman Fixel Institute for Neurological Diseases at UF Health; construction on a new building with an expanded mission is underway.

"We're always looking forward," Okun says. "How many can we help heal? How many can we help with their suffering?"

TODD GOLDE

Developing new therapies and managing an army of scientists

LOOKING FOR THE DOC? HE MAY BE IN THE LAB, ENCOURAGING STUDENT-SCIENTISTS IN THE PURSUIT OF POSSIBLE DRUG TARGETS FOR ALZHEIMER'S DISEASE. OR YOU MIGHT TRY HIS OFFICE, WHERE HE'S DESIGNING A

protocol for the UF-led 1Florida Alzheimer's Disease Research Center, a statewide effort he directs to fight a disease that affects as many as 600,000 Floridians. Or he could be brainstorming with a cross-disciplinary team in UF's Evelyn F. and William L. McKnight Brain Institute, known as the MBI, which under his direction is conducting some of the nation's highest-quality neuroscience research. Golde (pronounced Goldie), an international expert in the scientific understanding of Alzheimer's disease, became MBI director in late 2016, and since then has been facilitating multidisciplinary teams from among more than 150 faculty members from all 16 UF colleges who are involved in some kind of neuroscience research. The MBI has some of the world's leading experts in neurodegenerative diseases, such as Alzheimer's, Parkinson's and ALS; brain cancer; cognitive aging; dystonia; mental health, neurobehavioral sciences and psychiatry; and brain and spinal cord injury, and Golde's mission is to support research that translates into therapies that could benefit patients.

And while his own successes in the lab include a leading role in the series of seminal papers that laid the foundation for the breakthrough advance known as the amyloid hypothesis of Alzheimer's disease and, more recently, studies involving the use of antibodies to target psychological stress pathways, Golde's aim remains cracking the nut of developing new therapies.

"My true passion is trying to find new approaches to this challenge, not only for Alzheimer's disease but other neurodegenerative or neurological disorders that lack therapeutic options for patients," Golde says. "Our ultimate goal is to help contribute to research that will change the lexicon from being untreatable, incurable and inevitable to treatable, curable and preventable."