Researchers Receive Louis J. Elsas Award in Biochemical Genetics

In order to accelerate research in biochemical genetics, biochemistry, genetics, genomics, statistical genetics, and genetic epidemiology, three University of Miami Miller School of Medicine M.D./Ph.D. candidates and one M.D. candidate have been named recipients of the 2020 Louis J. Elsas Research Award in Biochemical Genetics.

The award honors the work of the late Louis J. “Skip” Elsas, M.D., a geneticist who served as the first director of the Dr. John T. Macdonald Foundation Center for Medical Genetics, now the Dr. John T. Macdonald Foundation Department of Human Genetics.

Established by the Dr. John T. Macdonald Foundation in 2011, the award supports outstanding medical students, graduate students, and postdoctoral fellows.

The four recipients, selected from a pool of 12 competitive applicants, will each receive an award of $1,875. They are:

**M.D. Candidate Nathan Balukoff, Ph.D.**

As a candidate in the M.D./Ph.D. program in cancer biology, Nathan Balukoff, Ph.D., wants to save cancer patients’ lives, both in the lab and in the clinic.
Dr. Nathan Balukoff

In the Department of Biochemistry and Molecular Biology lab of Stephen Lee, Ph.D., Balukoff is using innovative mass spectrometry and RNA sequencing strategies to uncover proteins and the translational machinery that causes cells in a tumor to become dormant.

“Working at the level of RNA (translation) as opposed to DNA is incredibly powerful,” Dr. Balukoff said. “For example, we found a translation factor called EIF5A that controls the dormancy response. By affecting it, we can cause cells to stop being dormant.”

The clinical implications are important – dormancy causes cells to become resistant to traditional chemotherapies and leads to recurrence.

Dr. Balukoff has an impressive research record and has published a number of articles. He was recently awarded the
prestigious F30 scholarship from the National Cancer Institute.

“Nathan is an exceptional student with an uncommon desire for clinical and basic cancer research,” said Dr. Lee.

Ultimately, Dr. Balukoff hopes to become an academic research oncologist. “I’m very thankful for this award,” he said. “I’m also thankful to the cancer biology program and to my mentor, Dr. Lee, for always supporting me.”

M.D. Candidate Olivia Gardner, Ph.D.

Olivia Gardner, Ph.D., first discovered her passion for genetics while in middle school. But it was at the University of Miami Miller School of Medicine, where she just defended her thesis and is completing her third year in medical school, that she developed an interest in Alzheimer’s disease, the most common form of dementia and the sixth leading cause of death in the United States.
“It’s an incredible honor to receive this award,” Dr. Gardner said. “It will allow me to continue to engage in research even after going back to medical school.”

Working under the mentorship of Margaret Pericak-Vance, Ph.D., and Anthony Griswold, Ph.D., at the Hussman Institute for Human Genomics, Dr. Gardner has focused on applying genomic and innovative computational approaches to better understand the pathophysiology of Alzheimer’s disease.

While most Alzheimer’s studies have centered on DNA, Dr. Gardner focused on identifying changes in RNA in people with the disease. More importantly, the study was not limited to individuals of European background but included individuals of African ancestry, which allowed her to account for differences in genetic factors leading to the disease across populations.

“Such investigations pave the way for extending precision
medicine to all individuals while offering potential new avenues of therapeutic intervention,” said Dr. Pericak-Vance, director of the Hussman Institute and the Dr. John T. Macdonald Foundation Professor of Human Genetics.

M.D. Candidate John Lee

As a student at the University of Miami Miller School of Medicine, where he is completing his final year of medical school after taking a year off to dedicate to research, John Lee joined the lab of Daniel Pelaez, Ph.D., and David Tse, M.D.

There, he focused on creating more precise and patient-specific therapies for eye conditions that rely on an individual’s pathological personal genome.

As part of his first project, he evaluated precision-based therapies for optic nerve gliomas, tumors that most commonly
affect children. Current therapies, which include chemotherapy, affect many other parts of the body. His aim is to target the tumor more specifically by finding the genes and components that are specific to it.

His second project focused on utilizing bioinformatic prediction software to identify novel therapies for thyroid eye disease. He found that though people with the disease may have the same symptoms, specific genes are either up regulated or down regulated in each patient. He worked to find specific drugs for each patient by sequencing disease samples and through the use of computational science.

Lee was one of two medical students in the country to receive the Research to Prevent Blindness Medical Student Fellowship this past year.

“John’s passion for applying scientific concepts in the development of new medical therapies was inspiring to me from the moment I met him,” Dr. Pelaez said.

Ultimately, Lee hopes to become an ophthalmologist, focusing on eye surgery and eye research. “Receiving this award is a huge honor,” he said.

M.D. Candidate Sze Kiat “Owen” Tan, Ph.D.

Originally from a small district in Malaysia, Sze Kiat “Owen” Tan, Ph.D., has always known that he wanted to be a physician-scientist.
At the University of Miami Miller School of Medicine, Dr. Tan temporarily paused his medical school studies to complete his Ph.D. He joined the lab of Scott M. Welford, Ph.D., an associate professor in the Department of Radiation Oncology at the Miller School, and took the lead on a project focused on the role of genetics and lipid metabolism in hypoxic tumors such as kidney cancer.

Through his research, Dr. Tan aims to uncover what causes cells in a renal cancer tumor to store fat, which enables them to grow, and how he can exploit that by targeting and removing the fat from the cell to cure it.

This work will be published in a high-impact journal, adding to Dr. Tan’s extensive list of first-author publications, scholarships, fellowships, and travel awards. “Owen is probably the most self-motivated student I have ever had, with an incredible drive and determination,” Dr. Welford said.
Tan recently returned to medical school for his final two years. He hopes to eventually work as a neurosurgeon-scientist in an academic institution, where he can split his time between clinical practice and running a research lab.

“I am incredibly honored to receive this award and for the support of the UM community,” he said. “The science we do is an interdisciplinary team effort and would not be possible without strong institutional support.”

A prominent force in the field of biochemical genetics, Dr. Elsas was a clinician who knew the promise of research. He came to UM in 2002 thanks to a generous multimillion-dollar gift from the Dr. John T. Macdonald Foundation, which allowed the university to establish a new program in medical genetics.

Dr. Elsas was recruited to lead the Miller School’s burgeoning work in the field by R. Rodney Howell, M.D., professor and chair emeritus of the Department of Pediatrics, a fellow geneticist, pediatrician, and longtime friend and colleague.

“Dr. Elsas’s personal work explored the genetic basis of a range of human conditions,” said Dr. Howell, a board member with the Dr. John T. MacDonald Foundation and chair of the Elsas award committee. “Like him, these applicants are seeking the genetic basis of a series of important diseases, such as Alzheimer’s disease, eye disease, and various cancers. All of the winners will have careers as physician scientists, like Skip.”