



Editor: Rachel Baugh

GREAT NEWS!

Summer Program Update

We are pleased to announce that Aspironaut™ Summer Research Internships are in-person and onsite this summer. Twenty-four undergraduate and ten high school interns from sixteen states will join us starting in June. Aspironaut™ staff have spent much time planning a safe and healthy environment for students, faculty and staff. Congratulations and welcome to the 2021 Aspironauts!



EXCITING NEWS!

Congratulations 2019 Aspironaut™ high school intern **Neve Redhair** and 2019 & 2020 high school intern **Madanna Vue**!!! Neve was accepted to Stanford University early action and Madanna was accepted early decision to Tufts University for the fall of 2021. We are so proud of both of you and can't wait to see all you achieve.



Neve Redhair - Stanford University



Madanna Vue - Tufts University

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Featured Aspinaut™: Dr. Isi Ero-Tolliver

Isi Ero-Tolliver, Ph.D., grew up the oldest of five children of a single mom, who is Nigerian. At a very young age, she and her family lived for years in low-income, government housing in Mississippi. In her neighborhood of high crime and violence, she and her family did the best they could until they were able to move to something better.

She was born in Jackson, Mississippi and then her family moved to Nigeria when she was three years old and stayed until she was nine. Isi was in elementary school when the family moved back to Jackson.

"It took some time to adjust when we returned from Nigeria. I had a hard time understanding people's accents." Despite the initial barrier, Isi realized the quality of education and wanted to learn to help herself and assist some of her friends. "My family is full of teachers and educators, so it came naturally. I liked teaching others what I was learning and this helped solidify my learning of concepts because, through this process, it helped me identify voids in my knowledge when I couldn't explain and it meant I needed to go learn some more."

As Isi moved through her undergraduate studies, she felt a sense of belonging and was encouraged by having a supportive community at Jackson State University. "I felt like I could be successful despite my initial lack of research experiences. I was intrigued by science during my first internship, where I was able to work on novel research. Nobody had the answers to the questions I was working on and this was very exciting to me." Dr. Ero-Tolliver earned a B.S. in Biology at Jackson State University



under the research mentorship of Dr. Huey-Min Hwang and completed her M.S. there as well under the research mentorship of Dr. Ernest Izevbigie. Her thesis research was conducted in the Life Sciences Division at Lawrence Berkeley National Laboratory under the mentorship of Dr. Priscilla Cooper and Dr. Eric Campeau.



Isi dreamed of becoming a research scientist and a teacher. She was accepted into the Ph.D. program in Biological Sciences as a direct admit at Vanderbilt University. At the time, she and her husband had four children under the age of 5. “It wasn’t easy; I had so many challenges to overcome during the first year. I knew I wasn’t getting the training I needed, but nobody really knew about it. I was so stressed and scared, but I knew failure was not an option.” The turning point occurred when Isi did not pass her first qualifying exam during her third year. “I knew I never wanted to feel like that again, so I reached out to some people who could help and many did help me.” That is when she met Dr. Billy Hudson, Professor of Medicine.

“He gave me an opportunity and was a person with whom I could talk through my past struggles. He reminded me how to smile again.” Isi joined his laboratory for her dissertation under the mentorship of Dr. Billy Hudson and Dr. Gautam Bhave. “I felt like I was part of a community again. Dr. Hudson will believe in you until you believe in yourself. It was an environment where anybody could grow and everybody did grow.”

Isi made major contributions to discoveries about the molecular glue (the sulfilimine bond) that holds collagen IV molecules together and directs cell behavior in tissues and organs. She earned a Ph.D. degree in Interdisciplinary Studies in Biological Sciences and Science Education and was awarded an NIH postdoctoral fellowship to further explore her discoveries. Her work was published in several top-tier scientific journals. In parallel with dissertation research, Isi served as a science educator for the Aspinaut summer research program. She taught chemistry to high school interns, mentored both high school and undergraduate students in biological experimentation, and served as an inspirational role model.

In 2015, armed with a Ph.D. degree and exceptional success in both research and mentoring of students, Isi was appointed to the position of Assistant Professor of Biological Sciences at the prestigious Hampton University. In 2018, the Pentagon awarded Hampton University a 4-million-dollar grant to enhance research and strengthen STEM educational programs. She also serves as co-PI of the DoD Center of Excellence in STEM scholars program. “We are in our 3rd year in supporting students from different STEM majors in their training. It’s exciting to see their maturity as they engage in our unique learning environment.” Isi, now a single mom, was promoted to Associate Professor, and in 2020, was named Interim Dean of the School of Science at Hampton University.

It’s no wonder Dr. Ero-Tolliver was named by Cell Mentor as one of the top 1000 Inspiring Black scientists in America in 2020. “I don’t feel more deserving than other scientists. I just feel the need to give back and influence the next generation.” And Dr. Isi Ero-Tolliver is doing just that. She created an outreach tutoring program within the Organization of Black Graduate and Professional Students (OBGAPS) at Vanderbilt University, and as the Interim Dean, her focus is to build a great foundation for scientists in training. “We are working together for our common goal to keep Hampton University one of the top HBCUs in the nation to produce the best and brightest students.”

WELCOME OUR NEW STAFF



Elena Pokidysheva, Ph.D.

ASSOCIATE SCIENTIFIC DIRECTOR

A scientist and mentor, Dr. Pokidysheva oversees the research laboratory experience of Aspirnaut™ participants.

Originally from the Russian Federation, she received a Master of Science degree from the Moscow Institute of Physics and Technology and a Ph.D. in Biophysics from the University of Basel, Switzerland in 2004. A postdoctoral fellow at Purdue University and Oregon Health

Sciences University and at Shriners Hospital, she joined the Hudson laboratory and the Aspirnaut™ Program in 2015, in the position of Research Assistant Professor in the Department of Medicine at Vanderbilt University Medical Center.

Dr. Pokidysheva has expertise in molecular and structural biology, biochemistry, electron microscopy, and animal models. Her current work focuses on solving the mystery of how diabetes and Alport syndrome cause kidney failure in millions of people worldwide. Recently, Elena has made several seminal discoveries about the molecular structure of the kidney filter, including the “garland” architecture and functions of collagen IV molecules of basement membranes. Her discoveries pave the way for the development of therapy.

While not in the research lab, Elena enjoys spending time with her family and raising two daughters, 15 and 12 years old. Being their parent also involves being a fan and prominent supporter of a Team USA figure skater and a middle-school basketball player.



Tetyana Pechenko, Ph.D.

SCIENCE EDUCATOR

Dr. Pedchenko is a gifted scientist, teacher and mentor. She was just 19 years old when she first experienced biomedical research and can explain molarity or kidney disease to anyone. She has mentored high school, undergraduate, and graduate students in the lab and in her new role as Science Educator of Aspirnaut™ Program, she will oversee the science communication skills modules and lab skills course in the summer research internship program.

Originally from Ukraine, Dr. Tetyana (Tanya) Pedchenko received a master's degree in Biophysics from the National Taras Shevchenko University of Kyiv and a Ph.D. in Pharmacology/Toxicology from the Institute of Pharmacology & Toxicology, Kyiv, Ukraine. A postdoctoral fellow at the University of Kansas Medical Center and Vanderbilt University Medical Center, she then moved to Nashville and in 2004 became a faculty member at Vanderbilt University Medical Center. Dr. Pedchenko joined the Hudson laboratory in 2019, in the position of Research Assistant Professor in the Department of Medicine at Vanderbilt University Medical Center.

Dr. Pedchenko has extensive expertise in molecular and cell biology, biophysics, biochemistry, and immunology. She has developed new tools and designed research methodology that enable creative experimental approaches to biological questions. Her current research focuses on discovering the identity of molecular triggers that cause Goodpasture's disease, a type of autoimmune disease that causes kidney and lung failure in thousands of people worldwide.

While not in the lab, Tanya loves to read and spend quality time with her cat and dog. She also enjoys the arts and plays the piano and guitar.

VI4 Virtual Webinar

On February 8th, Drs. Billy and Julie Hudson, along with Dr. Andre Churchwell, presented as panelists for the VUMC VI4 seminar. They spoke about "How to be a Research Ally" for students from diverse backgrounds. The session focused on building long-term mentorship and creating a sense of belonging for students from diverse

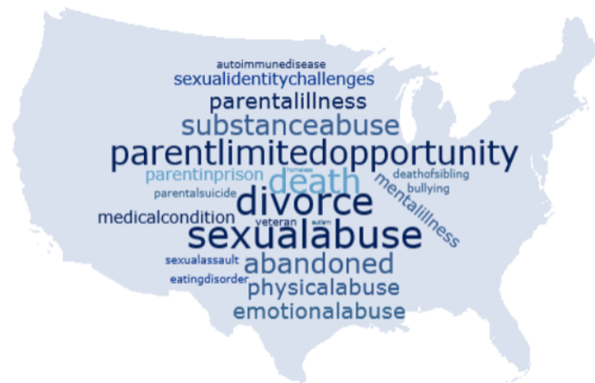
backgrounds. Aspirnaut™ aims to create an experience that helps the individual see their value and worthiness by building a community of trust and acceptance.



Other Life Experiences

April is child abuse awareness month. **25%** of Aspirnaut™ participants have an Adverse Childhood Experience (ACE) score of **4 or higher**. Adverse Childhood Experiences describe traumatic events occurring in a person's life before the age of 18. An ACE score of four or more out of ten increases the likelihood of negative effects on an individual's health including a wide range of chronic

diseases such as heart disease, diabetes, obesity, depression, autoimmune disease, substance abuse, and more. Prolonged and toxic stress from ACEs is known to change brain development, affecting an individual's learning, decision-making, and response to stress.



Aspirnaut™ has emerged as an intervention to mitigate the impact of adverse childhood events. Our holistic approach, which includes self-discovery, equips interns with self-management strategies and provides resources participants need to thrive. Aspirnaut™ launch "Wellness for Life" in 2019 and provide the tools for lifelong health and wellness. These include: long-term mentorship, psychological thriving skills, self-awareness instruments, Fitness Any Time Any Where, building a sense of community, and healthy choice.

If you know or suspect child abuse, please call the Tennessee Child Abuse hotline at 1(877) 237-0004.

If you would like more information on how to get involved with Aspirnaut™, please contact Rachel Baugh @ rachel.baugh@aspirnaut.org

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