FREDERICK P. WHIDDON COLLEGE OF MEDICINE
UNIVERSITY OF SOUTH ALABAMA

Med School Watercooler

Thursday, August 29, 2024

Medical students publish research study on match outcomes of neurosurgery residents

Richard Menger, M.D., associate professor of neurosurgery, conceived and designed the study.

Medical students from the Whiddon College of Medicine led a research study evaluating academic productivity and match outcomes of neurosurgery residents from medical schools without a neurosurgery residency program.

The research study was published in the Journal of Neurosurgery, the scholarly journal of the American Association of Neurological Surgeons and the most referenced neurosurgery-specific publication in the country.

The research found that medical students at institutions without a home neurosurgery residency program, or those with smaller departments, may encounter distinct challenges in producing research and could face a disadvantage in the neurosurgery match. Medical students interested in neurosurgery, particularly those attending medical schools without a dedicated neurosurgery residency program, often face limitations in terms of available projects, resources and research support.

"It is well established that research plays a significant role in determining who is selected for a neurosurgery residency position. However, access to research opportunities and support varies among institutions, which in turn affects students," said Garrett Dyess, a medical student at the Whiddon College of Medicine and first author of the research study. "Our study aimed to evaluate the quantity, quality, and changes over time in research papers produced by medical students from schools without a neurosurgery residency program."

The transition of the United States Medical Licensing Examination (USMLE) Step 1 to a pass/fail structure in 2022 sparked the interest of this study, as the new Step 1 scaling focuses attention on medical student research in their residency application. Step 1 assesses medical students' knowledge of basic science concepts and their application to clinical medicine. The exam is one of three components required for medical licensure in the United States and is typically taken by students after their second year of medical school.

It is reported that the criteria by which applicants are screened following the Step 1 reporting system has changed. While preferences for qualities are different between programs, previous research demonstrated the importance highly ranked programs put on prospects having significantly more pre-residency publications than their peers. Medical students aiming for neurosurgery programs are increasingly publishing papers, leading to higher bibliometric values each year.

Prior research studies have largely aimed at quantifying the research of medical student neurosurgery applicants, focusing on the number of peer-reviewed publications and their relation to successful residency matches and match ranks. However, no previous research has characterized the factors leading to matching in neurosurgery for applicants from medical schools without a home neurosurgical training program.

The study compiled a list of neurosurgery residents who matched from 2016 to 2022 from schools lacking a neurosurgery program, along with their demographic and bibliometric data, and compared publication counts by applicant. In addition, residency programs were ranked by research productivity and divided into top 40 and non-top 40.

Residents matched between 2016 and 2022 attended 52 medical schools lacking a neurosurgery residency program. The most common scenario found was one resident matched per institution. Notably, 45.1% of medical schools lacking a residency program had only one successful match in neurosurgery during this period.

"We hope this work will serve as a valuable reference for both students and neurosurgery residency program leaders, enabling a more accurate assessment of these students' research efforts when they are being evaluated for neurosurgery residency positions in the future," Dyess said.

See USA Health's full research study published by the Journal of Neurosurgery.

Conception and design of the research study was led by Richard Menger, M.D., chief of complex spine surgery, associate professor of neurosurgery, and vice chair of neurosurgery at USA Health; with help from Sudhir Suggala, M.D., complex spine and spinal deformity fellow in the department of neurosurgery.

Other contributors to the research include Whiddon College of Medicine medical students Garrett Dyess, Danner Butler, Stridhar Karne and Maxon Bassett; Luke Harris, M.D., a neurosurgery resident at the University of Mississippi Medical Center; Zackary Sabetta and Michael Rallo, Ph.D., M.D./Ph.D. students at Robert Wood Johnson University; and Susan Broom Gibson, associate professor of psychology at William Carey University.

Posted by Med School Watercooler at 12:57 PM

Now accepting nominations for 2025 Medical Alumni Association Awards

Nominations are now open for the 2025 USA Medical Alumni Association Awards, to be presented during Reunion Weekend, June 13-15, 2025. We need your nominations of outstanding Whiddon College of Medicine alumni and faculty who are worthy of this special recognition.

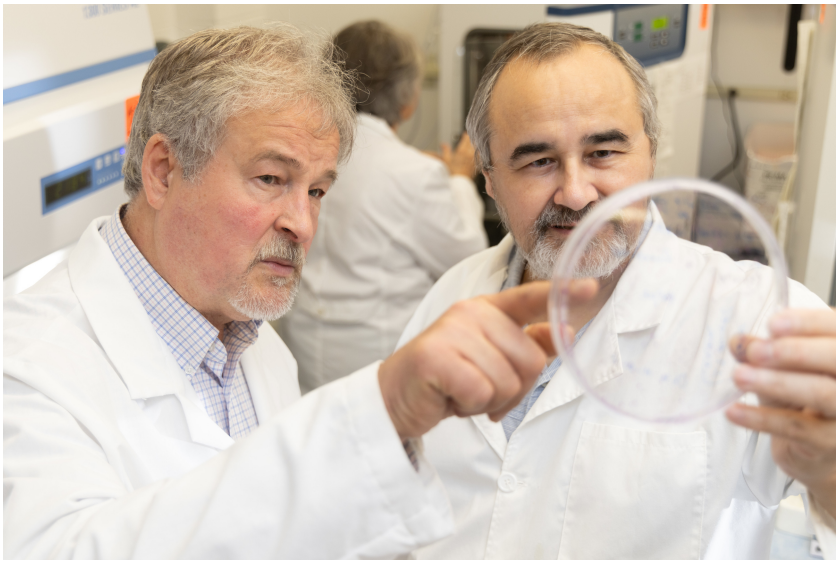

Dean Emeritus Sam Strada, M.D., and 1993 alumnus Daniel Potts, M.D.

For complete awards criteria and nomination forms, visit the Medical Alumni Association Awards page.

The deadline to submit nominations is Dec. 31, 2024.

Posted by Med School Watercooler at 12:37 PM

Alexeyev receives $1 million NSF grant to develop ‘designer' mitochondria



Mikhail Alexeyev, Ph.D., left, and Rafik Fayzulin, Ph.D., are working on the creation of artificial 'designer' mitochondria. Alexeyev is principal investigator of the project.

A grant from the National Science Foundation (NSF) will support scientists at the University of South Alabama Frederick P. Whiddon College of Medicine to create artificial “designer” mitochondria, enabling the development and testing of novel treatments for mitochondrial disease.

Mikhail Alexeyev, Ph.D., a professor of physiology and cell biology, is principal investigator of the project, titled “Designer Mitochondria for Biotechnology, Healthcare, and Basic Research.” Alexeyev was awarded $999,996 from the NSF’s prestigious and highly competitive Systems and Synthetic Biology program.

Synthetic biology is an interdisciplinary field that combines biology, engineering and computer science to design and construct new biological systems or modify existing ones. It involves creating synthetic DNA sequences and assembling them into organisms to perform specific functions, such as producing pharmaceuticals, biofuels or other useful products, Alexeyev explained.

“Essentially, it's about engineering biological systems with precision to address various challenges and innovate new solutions,” Alexeyev said.

Natalya Kozhukhar, Ph.D., Mikhail Alexeyev, Ph.D., and Rafik Fayzulin, Ph.D., are collaborators on the research.

Some of the recent advances in synthetic biology include CRISPR genome editing and making synthetic bacterial genomes. The next horizon in synthetic biology is creating artificial “designer” organelles and whole cells, Alexeyev said. An organelle is a specialized structure within a cell that performs a distinct function essential for the cell's survival and operation. Mitochondria, known as “powerhouses of the cell,” are an example of an organelle.

Remarkably, mitochondria are the only cellular organelles besides the nucleus with their own genome. This genome, called mitochondrial DNA (mtDNA), encodes several genes critical for energy production using a genetic code distinct from that used to encode all other cellular genes. mtDNA is essential for cellular function, and reduction in mtDNA content is associated with severe, irreversible, progressive, and ultimately lethal disease.

"Perplexingly, despite 97% genetic similarity between humans and orangutans, human cells reject orangutan mtDNA," Alexeyev said. "This phenomenon, which our lab termed the Interspecies Barrier for mtDNA Replication (IBMDR), has not been studied in detail, and it prevents us from harnessing the existing natural diversity of mtDNA for the goals of synthetic biology."

Alexeyev's project aims to fill this critical gap. In the proposed studies, his team will take advantage of the recent discoveries and technological advances made in their lab. These include the identification of the first component of IBMDR and the development of a method for in-situ reverse genetic analysis of proteins involved in mtDNA replication to identify all components of IBMDR and to overcome rejection of human mtDNA by mouse cells.

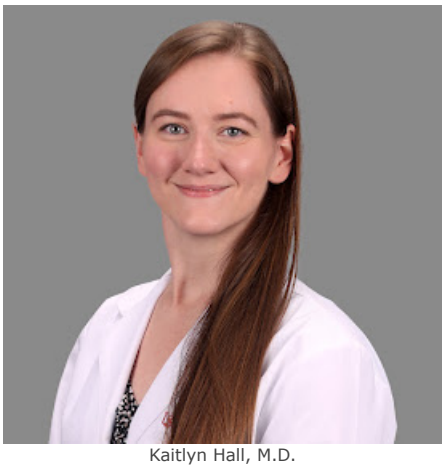
"The successful completion of our studies will pave the way for creating artificial 'designer' mitochondria, advance our understanding of mtDNA maintenance, and enable the development and testing of novel treatments for mitochondrial disease," he said.

Collaborators on the project are research associate Rafik Fayzulin, Ph.D., and research technologist Natalya Kozhukhar, Ph.D.

Alexeyev earned a Ph.D. from the National Academy of Sciences of Ukraine. He completed postdoctoral studies at the Texas Heart Institute in Houston. He joined the faculty at the Whiddon College of Medicine in 1996.

Posted by Med School Watercooler at 11:44 AM

Hall joins USA Health as emergency medicine physician


Kaitlyn Hall, M.D.

Kaitlyn Hall, M.D., a new emergency medicine physician at USA Health, thrives in the fast pace of the emergency department.

"I can get bored easily if my scope stays too narrow, so emergency medicine has just enough variety while staying focused on acute care," she said. "I like being able to make quick decisions whenever we're performing a resuscitation. I love the procedures we get to do, as well as the challenging medical patients."

Hall was exposed to emergency medicine while working as a medical scribe in Dallas before entering medical school, so she knew early in her education that she was interested in the specialty. She went on to earn her medical degree from the University of Texas Rio Grande Valley in Edinberg, Texas.

She joined the academic health system after completing her residency at USA Health, where she served as chief resident her senior year. "I liked being at a Level 1 trauma center, and the faculty members here were very supportive of my development as an EM physician," she said.

Now, she has the opportunity to pay it forward as an attending physician and an assistant professor of emergency medicine at the Whiddon College of Medicine. "I find it rewarding to watch the progression of students and residents become more confident and knowledgeable during their rotations and throughout residency," she said

A member of the American College of Emergency Physicians, Hall finds her career path very meaningful.

"In the emergency department, it's not infrequent that we meet people during one of the worst days of their life. It's a privilege to be able to provide treatment and reassurance to these patients," she said. "I find fulfillment in making patients feel better."

Posted by Med School Watercooler at 11:44 AM

New hospitalist volunteers her time and training here and abroad


Kim Phuong Thi Nguyen, D.O.

Kim Phuong Thi Nguyen, D.O., is driven by a purpose, one of giving back to others. The new USA Health hospitalist regularly devotes her time and training to the Vietnamese community and animals.

"Throughout my time in Vietnam and the U.S., I have volunteered at many temples, churches, clinics and animal shelters," she said.

Nguyen, who is also an assistant professor of internal medicine at the Whiddon College of Medicine, has two doctorates – one earned in traditional Chinese medicine and the other in osteopathic medicine. She also has training as an emergency medical technician and in sonography.

Though she is many miles away from where she grew up, Nguyen keeps Vietnam and the Vietnamese community close through her service to them.

"I travel to Vietnam every year to give back to the community, and organize charity events to donate clothing, blankets, and food to homeless people," said Nguyen, who founded the Duy Kiem Pharmacy charitable organization there. "I have held many free health screening sessions and workshops at the Vietnamese temple and church in Mount Vernon and Bayou La Batre, Alabama."

She completed medical school at the New York Institute of Technology College of Osteopathic Medicine in Old Westbury, New York, followed by an internal medicine residency at USA Health.

"Internal medicine allows me to practice in different settings, such as rural, urban, hospital and clinic," she said. "This profession provides me with a general knowledge of a variety of diseases that enables me to care for my family, myself and the community."

Nguyen was drawn to practicing in an academic health system for its ability to serve others through teaching.

"The academic setting allows me to access advanced technologies, which enable me to provide state-of-the-art care," she said. "In addition, I will have the privilege to train students and residents, and conduct research."

In her new role as a hospitalist, she has another opportunity to give back to the community.

"Growing up in Vietnam, I saw many unfortunate cases end unhappily due to lack of medical knowledge or poverty. Coming to the U.S., I got to know many Vietnamese people who live below the poverty line," she said. "I am grateful for what life has given me and I want to give back to the community. In the end, it is not about what I have or what I have accomplished, but it is about what I have given back."

Nguyen will provide medical care to patients at University Hospital.