Student-researcher earns prestigious fellowship

Apurva Sarathy, a doctoral student in the department of pharmacology, exemplifies the University of Nevada School of Medicine's commitment to research that aims to save lives, and she is a splendid example of student success at the University of Nevada, Reno.

Sarathy's growing devotion to muscular dystrophy research has already carried her from India to Nevada. Soon she will advance to a prestigious postdoctoral position at the National Institutes of Health’s National Institute of Neurological Disorders and Stroke (NINDS) in Bethesda, Md.

"I now have the opportunity to work with Dr. Carsten Bonnemann at NINDS," Sarathy said, noting that Bonnemann does research on congenital muscular dystrophies, including therapies for collagen VI related disorders. Sarathy will be joining his research team early this year.

Sarathy explained that normal muscle development and function require an intact extracellular matrix surrounding muscles. The collagen VI mutation causes a disruption between the extracellular matrix and the muscle, which in turn causes damage to the muscle fiber. Bonnemann is developing therapies for this neuromuscular disorder.

Accepting this post-doctoral position is a continuation of her studies on Duchenne muscular dystrophy, in the lab of Dean Burkin, professor of pharmacology, at the School of Medicine.

Duchenne muscular dystrophy is ultimately a fatal muscular disease that affects mainly male children. The lifespan of those affected by this type of muscular dystrophy is 20 to 30 years.

In Duchenne muscular dystrophy, a protein called dystrophin is missing, which causes muscle fiber to deteriorate. Burkin’s lab is developing therapeutics for this disease.

Working in collaboration with the National Center for Advancing Translational Sciences Chemical Genomics Center and the National Institutes of Health, Burkin, Sarathy and their colleagues identified a drug in a screen of 440,000 compounds.

“We generated several compounds that gave us a maximum increase in a protein called alpha 7 beta 1 integrin,” said Sarathy, explaining that elevating the levels of alpha 7 integrin might compensate for the loss of dystrophin, allowing for restoration of the muscle fiber’s integrity.

They focused on one drug because it had a high potency of the alpha 7 integrin. Sarathy is studying the effects of that drug for her dissertation, which is a focus on alpha 7 integrin-impacting drugs in the treatment of Duchenne muscular dystrophy.

A long journey to Nevada

Sarathy moved to the U.S. from Mumbai, India, where her family still lives, to start college at the University of Texas. There, she...
earned her bachelor’s degree in biology and her master’s degree in exercise physiology.

While at the University of Texas, her research team was investigating stem cell and growth factor therapies. They studied muscle regeneration after injecting rats with growth factor and stem cells.

“That project got me excited about muscle biology and made me want to learn more about factors involved in muscle maintenance and muscle growth,” she said.

During her skeletal muscle research for her master’s degree, Sarathy found that she “really enjoyed muscle biology.” She also was seeking a transition from the injury model to the disease model. She searched for a lab involved with disease research and found Burkin’s lab at the School of Medicine. In 2011, she moved to Reno to begin her doctoral studies.

Expanding horizons

Sarathy believes she made a wise decision in choosing the University, as Burkin’s lab is one of only a few in the world working on very rare congenital muscular dystrophies. The lab collaborates with top-ranked institutions, such as the University of Washington, UCLA and Harvard.

Sarathy has enjoyed her nearly five years in the program. She has learned a great deal, and has decided to stay in the field of muscle biology, where she believes she has a lot more learning ahead.

“The University of Nevada has been a great experience,” Sarathy observed. “When I moved from Texas, I was definitely very worried. The transition was a little bit hard in the beginning, but the wonderful weather helped.” And she met a wonderful lab team, which she thanks for supporting her throughout her time in Nevada.

“There is never a dull moment in the lab with them around. It has been an incredible learning experience. I am glad that I am still in the field of muscular dystrophy so I can keep in touch with them.”

Besides working in the lab and conducting her experiments, Sarathy has had the opportunity to travel to four conferences, where she was able to meet other leaders in the field of muscle biology.

“The School of Medicine and the University’s Graduate Student Association have been very supportive toward graduate students traveling outside of Reno to gain more experience. They have done a great job to further research.”

Philanthropy provides vital support

Along the way, philanthropy has provided critical support, allowing Sarathy to carry out her research and prepare for the next step in her career.

She has been able to continue her research at the University, in spite of severe federal spending cuts, known as sequestration, because of the Michael (Mick) J.M. Hitchcock, Ph.D. Fund for Graduate Assistants.

“I was fortunate to receive the Hitchcock fellowship, and Mick Hitchcock played a very integral role toward my success here,” said Sarathy. “He was very supportive toward our lab and has been very encouraging throughout my time here.”

Burkin also appreciates Hitchcock’s generosity.

“The fellowship has provided an opportunity for students to join my lab and participate in research. It allows them to explore their research interests.”

“The idea is to move these drugs that we have identified from the bench to the bedside. The Mick Hitchcock fellowship will help us progress toward that goal. We really appreciate Mick for his contribution. It has really been helpful.”

For his part, Hitchcock was happy that Sarathy was able to benefit from his fellowship.

“Apurva is exactly the type of student the grad student fund was designed to support. She has the intelligence, skills and enthusiasm that give her the potential to make great scientific advances in medicine in the future. I am proud to have participated in her achieving her Ph.D. and wish her great success for her career.”

In the future, Sarathy would still like to be involved in clinical research and may join a university or an industry that allows her to do so.

“I would like to continue to be involved in the field of muscular dystrophies and therapies for muscular dystrophies.”

“As a young scientist, she shows tremendous potential,” said Burkin. “She will have a really great career in biomedical research.”

“The idea is to move these drugs that we have identified from the bench to the bedside. The Mick Hitchcock fellowship will help us progress toward that goal. We really appreciate Mick for his contribution. It has really been helpful.”

—Dean Burkin, professor of pharmacology at the School of Medicine