




Jim Greipp

SCIENCE INFLUENCES EVERYTHING:

Anand Rao,
PhD candidate

Many biomedical doctorates have a point early in their careers when they consider the possibility of the physician's path. For Anand Rao, a doctoral candidate in neuroscience at the College of Medicine, that consideration was a blip. Scientific inquiry and education are in his bones, gratefully inherited from his parents. The recipient of government funding, Rao's rigorous studies of brain trauma have national and international significance. Biomedical research may be paramount for Rao, but making scientific knowledge accessible to others is equally valuable.



Anand Rao's research focuses on how toxins affect the normal function of neurons in the brain. He is a member of the international Gulf War Illness Consortium.

A third-year neuroscience student, Rao relishes being at the forefront of research, being able to conduct work that will improve lives. His current research, funded by the Department of Defense, focuses on brain trauma and chronic illness in veterans. Gulf War illness began occurring in 1991 when soldiers were exposed to a barrage of chemicals and toxins. More than 20 years later, soldiers and civilians exposed to this noxious combination continue to exhibit symptoms.

Rao is examining how three chemicals affect the brain: anti-nerve agents (pyridostigmine bromide, or PB), neurotoxins (in the form of sarin) and the pesticide DEET. These chemicals formed a potent cocktail that "acted in a synergistic way to cause chronic brain illness," he says.

The goal of the international Gulf War Illness Consortium, of which Rao is a member, is to develop potential therapies for those suffering from the illness. His particular research focuses on how toxins affect the normal function of neurons in the brain. Concern about Gulf War illness is global in scope, not merely because soldiers deployed to a hot site 20 years ago. "There are still active conflicts in the world," Rao says. "The use of sarin has not gone away."

Although Rao's global networking may seem uncommon, collaboration is routine at the College of Medicine. For instance, Rao's work is guided by scientists on and off campus. His primary mentor is Peter Baas, PhD, in the Department of Neurobiology & Anatomy. Baas is interested in how flaws in microtubules contribute to neurodegenerative diseases. Rao spends about half his time with his co-mentor, Mark Black, PhD, at the Temple University School of Medicine. Like Baas, Black studies neuronal microtubules and axonal transport. Back at Drexel, Rao also collaborates with Ramesh Raghupathi, PhD, Neurobiology & Anatomy, who does work in traumatic brain injury. Rao appreciates Drexel's openness to collaboration in the pursuit of scientific inquiry, and says he is excited to be able to "bridge the labs" of experts in their respective fields.

Growing up in Hockessin, Delaware, Rao was attuned to the scientific method from an early age. His father, Nandan, an organic chemist with DuPont, taught him "to appreciate the science in everything," including, he mentions, blades of grass converting sunlight into energy.

This curiosity and engagement with the world was similarly fostered by his mother, Veena, an elementary education teacher. "Her goal is education," Rao says. Coming from this background, he understood that "science influences everything we do" — and that it's important to share this knowledge with others.

This broad academic interest was refined at the University of Delaware, where Rao majored in biological sciences. He also worked in a nursing home at this time, meeting patients who had Alzheimer's disease and Parkinson's. He says, "The idea that you could forget who your family is, that you could lose motor function, is tragic." Despite the diseases' pathos, Rao was fascinated. "That was it. Neuroscience was the field for me."

After graduating, Rao spent two years at Penn State's College of Medicine studying Parkinson's in non-human primates. When he began applying to doctoral programs, Drexel stood out for its collaborative approach to research. In contrast, in the larger programs Rao looked at, graduate students worked for post-docs.

Meeting the faculty at Drexel, however, he says, "I immediately got the sense that everyone was willing to help nurture the students. Now, three years in, I see this is really the case." Drexel was also willing to let him find his way. Rao notes that when he joined the neuroscience program, he did not have a precise research focus in mind but was, in a way, "still exploring" a field he loved. "A lot of programs will ding you for that," he observes, "but Drexel saw the potential. They said, 'You will find a home here.'"

Indeed, he has.

In addition to his work, Rao has been involved in the Graduate Student Association. He has served as president, and this year he is an MS/PhD representative for the GSA. Rao takes these endeavors seriously. "My goal is not only to contribute to the advancement of science, but to give back to the university that gave me this opportunity," he says. During his tenure with the GSA, Rao feels he has "created some meaningful change" for his fellow graduate students. He helped create a grad student mentoring program, for example, as well as expand the GSA's travel award program for international conferences.

At heart, Rao enjoys making science accessible and real for people. One way he's doing this is through Pint of Science. An annual science festival originating in the United Kingdom, Pint of Science brings scientists out of their labs and into a bar to discuss their research with the laity over a beer. Rao and three colleagues introduced Pint of Science to Philadelphia this year.

Rao attributes his desire to spread scientific knowledge to his parents: the father who taught him to see science in the everyday, and the mother who places a premium on education. Rao is doing a tremendous job in the lab as well as through his civic and outreach opportunities. "I like being at the forefront of research," he says. "It's there. It's tangible. No one else in the world is doing this exact research." Reflecting on his decision to pursue his work at the College of Medicine, he says, "I'm so happy with my decision."