Examining the Aging Process
Rahul Rai, Driskill Graduate Program in Life Science

Rahul Rai, a fifth-year student in the Driskill Program in Life Science, studies the role of apelin in the aging process in the lab of Douglas Vaughan, PhD, chair of Medicine. Prior to his beginning his training at Northwestern, Rai earned a Bachelor of Medicine from Panjab University in India. After completing his Northwestern degree, he hopes to enter into an academic program that allows him to practice both of his passions, clinical medicine and research.

Q&A

Where is your hometown?
I am from Chandigarh, India. It’s a small city about 150 miles north of the capital, New Delhi.

What are your research interests?
I try to keep myself updated on research being undertaken in all fields of medicine. Knowledge of other fields not only enhances the quality of your project, but also is a good icebreaker. As a student in the lab of Douglas Vaughan, MD, I have developed a deep appreciation for the aging process. Questions like: “How and why we age? What are the processes which mediate aging? Why some people age slower or faster than others? And is aging reversible?” are some of the things we think about and work on all of the time.

What exciting projects are you working on?
My thesis project involves the study of apelin and its role in aging. Apelin is small protein which is made primarily by the endothelial cells (cells lining our blood vessels). Since this is a newly-identified protein, its physiological role hasn’t been extensively assessed. When I started working on my thesis project, we noticed that multiple studies had shown that apelin levels were lower in patients suffering from diverse disorders like hypertension, heart failure, diabetes, renal disorders and pulmonary hypertension. This was a peculiar observation, why would decrease in levels of one small protein affect so many organs and cause seemingly unrelated pathologies? It was also noteworthy that most of these disorders are more commonly seen in the aging population.

We hypothesized that a decrease in levels of apelin contributes to the aging process. In last few years we have shown that levels of apelin decrease with age. In addition, mice lacking apelin age faster and exhibit features of cardiovascular, metabolic and renal aging. Lastly, at least in mice, when we restore the levels of apelin, we can reverse some components of the aging process. We are working on further confirmation of our findings and hope to publish these in a high-impact paper soon.

What attracted you to the PhD program?
I loved that the DGP is an integrated program. It gave me the freedom to choose my area of research after joining Northwestern. As a student, you enroll, take classes, rotate in different labs, meet faculty and then decide what you would like your area of research to be. Secondly, I was really impressed with people running the DGP program, especially Steve Anderson, PhD and Judy Brown. They made the whole interview process and the transition to Northwestern really effortless.

What has been your best experience at Feinberg?
Winning the second prize in basic research at Research Day 2016 was pretty cool. It’s always nice when your hard work is recognized. I’d also like to think that my best experience at Feinberg is yet to come.

How would you describe the faculty at Feinberg?
The faculty at Feinberg are extremely supportive, approachable and encouraging of new ideas. We are currently collaborating with labs of Joseph Bass, MD, PhD, Teresa Woodruff, PhD and Daniele Procissi, PhD. These collaborations have helped us develop a more exhaustive and accurate assessment of our mouse models. In addition, faculty members at Feinberg also serve as terrific role models and we look up to them for both professional and personal supervision.

What do you do in your free time?
I like to be physically active and I plan to run the Chicago Marathon this fall. I also enjoy catching up on NBA games.

What are your plans for after graduation?
Although I have really cherished my time doing bench research as a graduate student, I do intend to return to clinical medicine and will be applying for the 2017 match in Internal Medicine. I hope to get into an academic program where in addition to my clinical training, I can undertake research.

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