

Research opportunities abound for graduate student

Graduate student Hafasa Mojaddidi's passion for science led her to Dominican as an undergraduate, drawn to the prospect of being able to immerse herself in research early in her academic career.

By the time she was a sophomore, Mojaddidi '14 was working on understanding the potential inhibitory effects of a novel heteroarotinoid analog on [breast cancer](#), in collaboration with a medicinal chemist from Touro University in Vallejo. As a junior, she presented her work at the National Conference on Undergraduate Research (NCUR) in La Crosse, Wisconsin. Her impressive scientific resume helped her land an internship over the summer before senior year, which led to a permanent research position at Stanford University immediately after graduation.

Now enrolled in Dominican's [MS in Biological Sciences](#) program in the [School of Health and Natural Sciences](#), this in-depth exposure to research continues as she works alongside Dominican faculty mentor, [Dr. Meredith Protas](#), drawing on both genetics and molecular biology to study eye and pigmentation differences in a rare cave dwelling crustacean.

Mojaddidi first visited Dominican as a high school sophomore at Fremont's Kennedy High School, attending a humanities conference in Angelico Hall. The campus made a strong first impression – and one she remembered during her college search.

"The campus was beautiful," she recalls. "I knew when I started to look for colleges, that I would want to return to Dominican for a campus tour."

After touring the campus – including the new [Science Center](#) – and talking with faculty and students, Dominican rose to the top of her list.

"Everyone I met at Dominican was so friendly and welcoming. I talked with professors and really liked the sound of taking smaller classes, getting to know my teachers, and getting involved with research early on," Mojaddidi says.

As a Muslim-American, she also appreciated the University's interfaith community once she arrived on campus. "I have met students from many faiths, and have never once felt out of place at Dominican. This is a very open minded community welcoming to all."

It was her undergraduate research mentor, Dr. Maggie Louie, who encouraged Mojaddidi to enroll in Dominican's master's program. Mojaddidi had worked in the Louie lab examining the effects of novel cancer drugs on breast cancer cell growth, gaining exposure to a level of biochemistry not enjoyed by many of her high school classmates attending larger universities.

"Some of my friends who went to much larger schools are still working on their undergraduate degree. They've either not been able to get the classes they need to graduate, or they spent a couple of years just figuring out what they wanted to do because they didn't have anyone giving them advice or hands-on experience like Dominican."

Today, Mojaddidi and seven undergraduates are working in the Protas lab. While the undergraduates are learning lab protocols and assisting with experiments, Mojaddidi is creating her own protocols to study the genetic basis of eye and pigmentation differences in the isopod cave crustacean, *Asellus aquaticus*. She is comparing embryos of the surface dwelling animals - which have both eyes and pigmentation - with embryos of those living in darkness in the caves, lacking both eyes and pigment. The goal is to understand exactly when and how the changes between the two populations occur. Given that many of the genes and cellular pathways responsible for eye development in humans are the same in invertebrates, findings could help provide insight into eye degenerative diseases in humans.

The master's program allows her to think and work like a researcher, rather than a student.

“As an undergraduate, you expect to be told what to do and how to do it,” Mojaddidi says. “In the master’s program, you learn the techniques and are told what is expected, but you need to think about what you need to do to answer the questions and get the results. You get to think outside the box.”

This is the second year the Protas lab has been established at Dominican. Working in a new lab provides both challenge and opportunity for Mojaddidi, who notes that “there’s a lot of trial and error involved with the research.” In recent months, Mojaddidi has created and then tested different protocols. This semester she has started to collaborate with researchers from UC Berkeley, who are working on another species of crustacean.

“The animals are not similar enough to depend on their protocol, but I am working with their graduate students to figure out tips on ways to approach my work.”

Mojaddidi has completed her work at Stanford and is focusing on completing her master’s degree. During her time there, she assisted on the statistical analysis aspect of experiments on patients that focused on the relationship between Obstructive Sleep Apnea and Insulin Resistance. She had already been an author on three peer-reviewed and published articles with the research team from Stanford.

“I feel that Dominican has provided me with so many opportunities, both during my undergraduate and graduate years that I am well prepared and excited to decide on my next step, my doctorate – either MD or PhD – or both degrees.”

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