

Biology major wants to help solve the puzzle of cancer

By Marcia Locke

Mackenzie Thornton is an ambitious senior in microbiology and pre-medicine at Kansas State University. She started working in a laboratory during her first semester of college, and now she's applying to medical school. The self-proclaimed puzzle enthusiast wants to help solve the problems of complex diseases.

Thornton works with Katsura Asano, professor of biology, studying translation, the cellular process of producing proteins. Misregulation of translation can lead to diseases like cancer. Thornton is looking specifically at gene expression changes that occur during translation under nutritional stress in human colorectal cancer cells.

"Proteins regulate cell cycle, cell division, cell motility — everything cells need to survive — so it's important to study them," Thornton said.

According to Thornton, one way the body tries to fight cancer is by starving the cancer cells, withholding the nutrients they need to grow.

"We're trying to understand how cancer cells regulate translation and are able to grow, proliferate and metastasize in a nutrition-stressed environment," Thornton said. "We want to know the exact mechanisms that allow them to keep growing when they shouldn't."

The Asano lab's ranking student researcher for two years now, Thornton says that working in the lab has helped expand her knowledge in cancer biology and genetics, along with developing time management, leadership and communication skills. It has also reinforced her enjoyment of research and decision to attend medical school.

Thornton is thankful for her Cancer Research Award from the Johnson Cancer Research Center.

\$100,000

a year is dedicated to training undergraduate students to do scientific research.

"The CRA funds help a lot," Thornton said. "I don't feel pressured to work outside the lab and spend less time conducting my research because my lab time has value."

She also appreciates the Cancer Research Award Banquet that recognizes the awardees and their mentors as well as the donors who make the awards possible.

"I loved meeting my donors, Jim and Kathy Haymaker, and chatting with them and learning that Kathy was in my sorority," Thornton said. "It was also fun to get out of the basement of Ackert Hall and socialize, but still in the science realm, and see what everyone else was doing."

In addition to her CRA, Thornton received a national Barry M. Goldwater Scholarship, a Kansas IDeA Network of Biomedical Research Excellence Star Trainee Scholarship and several other awards and honors. One of her favorite experiences was participating in the University of Kansas' Summer Student Research Trainee Program, studying head and neck cancers with a respected and enthusiastic otolaryngologist.

"Awards and honors motivate students to stay involved," Thornton said. "It's nice to be told that what you're doing matters."

Thornton credits her biology teacher at Blue Valley North High School in Overland Park, Kansas, with sparking her interest in biology.

"I discovered I really liked biology, specifically on the molecular level, when I took AP Biology with Ms. Riss," Thornton said. "She made it fun to learn biology. When other people are happy and excited, it flows onto you."

Another personal experience inspired her to go into research. At the beginning of her freshman year, her grandfather was diagnosed with amyotrophic lateral sclerosis or ALS.



"Being told we don't have a cure, we don't know what causes it, there's a lot of research but not enough answers — that made me want to get into research and contribute to the solution somehow," Thornton said. "Every scientist contributes in one way or another, and it takes an army."

