Jaclyn Cañas-Carrell impacts the science, technology, engineering and math community through her commitment to service and research in environmental toxicology.

by Kaitlyn Hale

She was encouraged by her parents and teachers to become a physician, but Jaclyn Cañas-Carrell took her career in a different direction when she discovered a love of environmental toxicology as an undergraduate research assistant at Texas Tech University.

"I had an excellent research mentor," Cañas-Carrell said, referring to Todd Anderson, a professor of environmental chemistry and chair of the Department of Environmental Toxicology.

Cañas-Carrell did get accepted to medical school, but she ultimately chose to stay at Texas Tech and follow her passion to earn a doctorate in environmental toxicology.

Today, she is an associate professor of analytic toxicology and environmental chemistry in the College of Arts and Sciences, and is making her own impact on the lives of countless science, technology, engineering and math (STEM) students.

Inspiring the Next Generation of STEM Scholars

Cañas-Carrell began co-teaching an environmental toxicology class for Science: It's a Girl Thing in 2007. The residential summer camp for girls is designed to educate students in grades 5–11 about careers and opportunities in the STEM fields.

She also has served as the adviser of the Texas Tech chapter of the Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) since 2008, and is a member Texas Tech's Advisory Committee for the Center for Active Learning and Undergraduate Engagement.

Cañas-Carrell says she draws much of her inspiration from the students she helps.

"When I see how my efforts benefit them directly, or how the opportunities I’ve set in their path have changed lives, I am encouraged and inspired to continue to seek funding to provide such experiences for these students," she explained.

Providing those experiences to her students is exactly what she is achieving as the director of the National Institutes of Health-funded Plains Bridges to Baccalaureate program, a partnership between Texas Tech and South Plains College that supports underrepresented minority college students interested in STEM areas.

Bridges to Baccalaureate allows students to explore careers in science through an undergraduate research experience at Texas Tech. Students attend workshops that provide advice on how to succeed in college and prepare to transfer from South Plains College to a four-year institution like Texas Tech.

Since its start in August 2008, 55 students have gone through the Plains Bridges to Baccalaureate program. Seventy-one percent of those students have transferred–almost twice South Plains College’s standard transfer rate of 39.5 percent.

Students are not required to transfer to Texas Tech, but Cañas-Carrell said approximately 95 percent of those in the program do, a majority of whom continue on to major in a STEM-related field.

In January 2014, the program was awarded $1.1 million in funding to continue for another five years.

With this funding, Cañas-Carrell began implementing the second phase of the program, which annually places 12 students in laboratories for a 10-week summer research experience at Texas Tech University or the Texas Tech University Health Sciences Center. Students work the summer after their freshman year on research in subjects from biomedical to social-behavioral sciences.

Impacting the Global Environment

Despite her many areas of service, Cañas-Carrell is still firmly focused on the field of environmental toxicology. Currently, she is working on studies in her current
area of interest, manufactured nanomaterials, like nanotitanium dioxide which is used in sunscreen.

"My lab is really focused on nanomaterials and looking at interactions in the environment," Cañas-Carrell explained. "Specifically, we work mostly in a terrestrial system, so we do a lot of work with plants, worms, microorganisms and soil."

Her research has a direct impact on what is known about how nanomaterials affect human health, all other organisms and the environment.

Cañas-Carrell said she studies how these materials move around a particular environment, how they interact with other chemicals in that environment and the potential risks involved with those interactions.

"All the research we do is with the intent of assessing the toxicity of a substance as well as the implications if an organism is exposed," she said.

Cañas-Carrell said her love of working in the field stems largely from its constant change.

"We work on a particular contaminant or class of contaminants for a few years, find out everything we can, make our contribution, and then we move on to what’s the next pressing chemical of concern," she said.

While being in the lab and working on research keeps her job interesting, Cañas-Carrell said that service will always be an important aspect of her career.

"I strongly believe that trying to tie service activities in with teaching and research provides an overall greater job satisfaction," she said.

The Institute of Environmental and Human Health (TIEHH) develops environmental and health sciences research and education at Texas Tech and Texas Tech University Health Sciences Center.

The institute's goal is to position Texas Tech as an internationally recognized force in the integration of environmental impact assessment of toxic chemicals with human health consequences, framed in the context of science-based risk assessment to support sound environmental policy and law.

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