

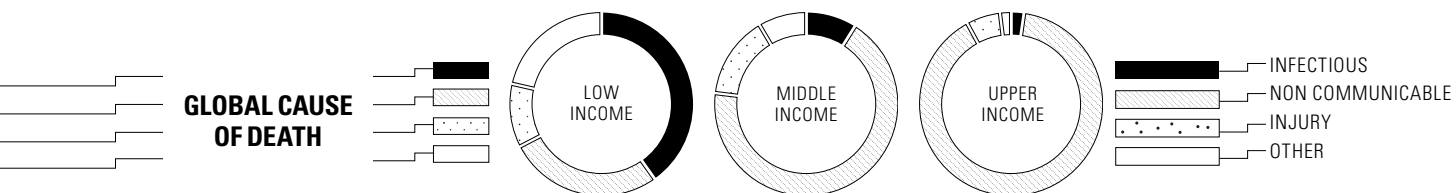
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Saluting Texas State Trailblazers p12 Former Bobcats make it to the NFL p58

TEXAS
STATE
UNIVERSITY
The rising STAR of Texas



Noroviruses are just the first phase of the project.

Weigum also is working on making the paper tool sensitive to *Cryptosporidium* and *Giardia*, protozoan parasites that also cause diarrheal illness. She envisions developing the tool so it can even detect bacteria such as *Salmonella*, *Campylobacter* and other food or water-borne bugs. “The idea here is to use the technology as a platform that can detect different infectious agents,” Weigum says.

Her solution is taking shape with the help of a Career Development grant from the Western Regional Center for Excellence in Biodefense and Emerging Infectious Disease Research, which is centered at The University of Texas Medical Branch in Galveston. The center is supported by an 11-year, \$105 million grant from the National Institutes of Health and is drawing researchers from five states together in the search for newer, faster ways to detect emerging infections, including agents that could potentially be deployed as terrorist weapons. The WREC’s Career Development program supports scientists at the early stages of their careers that have promising ideas for improved detection or treatments for potential bioterrorism threats.

Weigum began her science career as a high school teacher in San Antonio, and then returned to the classroom as a student to pursue advanced degrees at The University of Texas in Austin. After earning master’s and doctorate degrees in biochemistry, she moved to a postdoctoral fellowship in bioengineering at Rice University, where her love of biology began to merge with materials science and opened the door to cutting-edge engineering innovations in developing diagnostics. Now at Texas State, her diverse training is taking shape in the development of an innovative tool with

tremendous potential impact, says David Walker, M.D., executive director of the WREC.

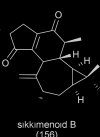
“Dr. Shannon Weigum embodies the perfect example of a talented young scientist who made the transition from a postdoctoral fellow to an assistant professor by successfully competing for research funding while meeting her teaching obligations,” says Walker, the chairman of pathology at UTMB.

“In addition to the development of a new platform for detection of clinically-relevant noroviruses that could improve diagnosis and monitoring of diarrheal illness, Weigum’s project establishes an important collaboration among The University of Texas Medical Branch, Texas State University and Baylor College of Medicine,” Walker adds. “Her paper-based microfluidic assay is being developed for use in resource-poor countries, and should lead to better diagnosis of diarrheal diseases that are often deadly in young children.”

It is not hard to imagine the illnesses and potential deaths that could result from terrorists’ release of infectious agents into the food supply, whether in food processing plants, community water supplies or even sprayed across a food buffet. But food- and water-borne illnesses also are a real world problem that public health providers face every day in restaurants, hospitals, daycare centers and even luxury cruise ships. Those arenas provide potential markets that could make her diagnostic tool a commercially viable product.

Weigum says her diagnostic tool is a few years away from the market. “We need more funding to refine and expand the platform, then maybe a commercial partner to collaborate in the manufacturing and distribution,” she says. ☺

“If someone is infected with a norovirus, then obviously, treating them with an antibiotic is not going to help,” says Weigum. While antibiotics work against bacterial infections, they don’t do any good against viral infections.



48%
Women
in U.S.
Workforce

SPARK

OPENING POSSIBILITIES

FOR MORE

WOMEN IN SCIENCE

24%
Women in
STEM Fields

By Ashley Festa

Engineering jobs are as varied as the imagination, and Texas State University is opening up the possibilities for its young women. While women represent only a fraction of the STEM (science, technology, engineering and mathematics) workforce, the federal government aims to encourage college women to pursue these fields. Taking a cue from the government, the College of Science and Engineering has developed a program called SPARK that seeks to pique its female students' interests in computer science and engineering.

"In the last 10 years, growth in STEM jobs has grown 80 percent faster than other jobs," says Susan Romanella, co-principal investigator of the SPARK Scholars Program. "Women comprise 48 percent of the total U.S. workforce, yet remain significantly underrepresented in the science and engineering workforce. We are attempting to increase the talent pool by increasing the number of women in these fields, particularly in engineering and computer science. It's of national and economic importance."

Texas State received a four-year, \$600,000 grant from the National Science Foundation (NSF) through the organization's SPARK program; the leadership team includes Dr. Clara Novoa (Ingram School of Engineering), Susan Romanella (College of Science and Engineering), Dr. Anne Ngu (Department of Computer Science) and Dr. Reiko Graham (Department of Psychology). The grant funds the program's activities and provides participating students a \$10,000 annual renewable scholarship for the duration of the grant. To remain eligible, SPARK students must meet academic, financial and program requirements each semester.

Eighteen students were accepted into SPARK's first cohort, which is now in its second year. SPARK's goal is to retain and support this group of students through graduation. The program supports participants by pairing students with faculty and peer mentors, study groups and STEM tutors. Hands-on learning experiences – such as spatial visualization training and a recent three-day robotics camp – are built into the program to enhance the students' skills. The students lived in a dedicated learning community on campus (year one), co-enroll in classes, participate in academic enrichment and group social activities and spend time building bonds of friendship and community with one another.

Novoa, the advisor for the student chapter of the Society of Women Engineers at Texas State, notes the importance of male advocacy in supporting female achievement in STEM. "We are pleased to also have three male students in SPARK. Closing the gender gap in STEM cannot be achieved without support from our male colleagues," she says.

Throughout the program, SPARK students make industry visits to learn about paths they can follow within their field. "We try to get their feet wet as early as possible so they can see how broad the possibilities are for using these degrees," Romanella says. One such visit, a spring tour of the Circuit of The Americas (COTA), revealed engineering jobs in which human lives are at stake. COTA is a multi-purpose facility and racetrack in Austin built to host prominent racing events, such as the Formula 1 U.S. Grand Prix.

"It was really cool because they got to show us how they built it," says Claire Barbosa, a junior studying industrial engineering. "People had to think about what they were doing, just about the track itself. They had to make sure there wouldn't be any potholes and to make sure the dirt wouldn't crack. That was amazing to me because they can't afford a pothole in a racetrack. That could kill someone."

Tokyo Electron America, a corporate partner for the SPARK program, made the tour possible by enlisting COTA's support for a day's visit to discuss STEM. The global semiconductor manufacturer also offers job-shadowing days to show students other types of engineering jobs.

"They're not just doing coffee and taking notes for a day," says James Mulhall, installation & planning manager for Tokyo Electron. "These students have been able to

meet with a representative from each part of our corporation, including a corporate executive. It's a one-on-one coaching session."

With a tremendous push in tech-focused companies to diversify its workforce, Tokyo Electron hopes its partnership with SPARK will help draw more women into the engineering and computer science fields. Mulhall admits he has personal reasons, too. As someone who grew up in a single-parent, socio-economically challenged home, Mulhall relates to SPARK students and wants to send them a strong message of encouragement: "Women can own their destiny." And he shows them how that's possible.

"For success in life, it's always best to have mentors, to see someone who had the same path you have, the same tough childhood," Mulhall says. "You relate better."

To help build that same support and solidarity among participants, SPARK students live in a residential learning community, where they become like family, says Eunice Solis, a sophomore majoring in engineering technology. "As a kid, your family pushes you," Solis says. "They remind you when homework is due or it's time for that practice. It's been a lot like that here. We take care of ourselves, but we also help each other."

Barbosa agreed. "What helped me most was all the support and motivation I get from this program," she says. "(It's) living in a community where people actually care about their work and want to succeed in life. It helps a lot for people to want to go places and do things and be the best they can be." 🌟

Oh, the places you will go!

SPARK offers early exposure to numerous and varied jobs available to students who graduate with engineering or computer science degrees, says Susan Romanella, who helps lead the SPARK leadership team. James Mulhall, of Tokyo Electron, asked the SPARK students he mentors to explore opportunities in the field of engineering that aren't at the mechanical level.

Students have already seen the potential.

"SPARK changed my perspective about what I can do with an engineering degree," says Eunice Solis, an engineering technology major. "I used to think it was just working in factories." Now, she hopes to work in the aerospace industry, perhaps with airplane engines. But she's not going to make a final decision just yet. "I want to take these four years to see what other doors open for me."

"I want to create or invent," adds Claire Barbosa, an industrial engineering major. "I want to go further than just a job with my career. I want to be able to help people all around me." She's keeping her options open for now, considering jobs at Tokyo Electron, Samsung or NASA. She notes that a friend has an internship at Boeing this summer. "I've also heard you can work at a theme park," she says, "and I secretly want to do that."

Mulhall is using connections at Tokyo Electron and the Austin business community to provide networking opportunities for SPARK students. "STEM fields are ripe for individuals with bright minds, strong work ethic and passion," he says.

"So why not women?"