

Elizabeth S. Sztul

By the time you read this, Elizabeth Sztul will be back home in Alabama, surveying what's left of her garden after a year's neglect. Sztul will have finished her term as a "rotating" program officer (see page 7) at the National Science Foundation (NSF) and returned to her membrane trafficking and protein degradation lab at the University of Alabama in Birmingham (UAB). It is a long way from Poland, where she was born, or from New York City, where she landed with culture shock in her mid-teens. UAB also is far from the Ivy League schools where she trained and where her career began.

In typical style, Sztul has found her time as an NSF program officer illuminating. "This has been a truly amazing experience," Sztul reported this spring, as she was finishing up her one-year stint in the NSF Molecular Biology and Cellular Bioscience Division. "I think everyone in science should do this. It will make you a better scientist because it makes you think about the bigger picture."

Classic Cell Biology

Elizabeth Sztul has always had a big picture view of cell biology, according to Rich Kahn, a biochemist at Emory who is collaborating with Sztul on studies of Arf-family proteins associated with Golgi "approximal" compartments. He traces it to her training under George Palade at Yale. "Elizabeth is a real classically trained cell biologist, having worked with Palade and [Palade collaborator] Kathryn Howell, doing really careful, hardcore studies."

Kahn and Sztul were at Yale at the same time but did not meet until 10 years ago at a Federation of American Societies for Experimental Biology conference in the Rockies. "I think it was Breckenridge," Kahn recalled. "I do remember that skiing was involved." Their conversation turned to protein trafficking in early Golgi, and they were immediately on the same wavelength.

"So much cell biology today is gross overexpression, GFP tagging, and similar

things that I don't have a lot of confidence in. Elizabeth's work has always been much more detailed and, in my view, accurate. She is very critical of her own work as well as [that of] others," Kahn explained. "Elizabeth quickly became one of the people I call up when I have a question and want the real answer, and not just the quick and dirty answer."

Choosing Science

Sztul was born in southwestern Poland and immigrated with her parents to New York when she was 15. "It was a disruption," Sztul recalled. "I basically had to leave everything I knew behind." She felt bewildered by the skyscrapers of Manhattan, American high school culture, and American English. "I passed the New York Regents Exam [for graduation] with one point above the passing grade in English but scored 90-something on the math," she recalled. "You don't forget that sort of thing."

Sztul moved on to Brooklyn College where she discovered lab science under a charismatic botany professor. "Basically I wanted to be him," Sztul recalled with a laugh. "I always liked biology, but the real reason why I gravitated to science was because my English wasn't good enough to do other things." Looking back, Sztul believes that moving to the U.S. was challenging but also strengthened her natural resilience and perseverance, leaving her open to new experiences. That's part of the reason, Sztul believes, that she was able to make bold decisions such as moving to UAB as a single parent with her 10-year-old son, Matthew, or taking Matthew at 15 to Oxford, UK, on her year-long sabbatical. Perhaps, she said, it's why she found a year at NSF so appealing.

The Palade Lab

Taking her own path led Sztul to transfer from a graduate program in botany at the University of Maryland to Yale to study cell biology. At the time, the excitement in cell biology was coming

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Read more about the National Science Foundation's "rotator" program on page 7.

from mammalian studies, Sztul remembers, and a hot spot was the new department of cell biology that George Palade had established at Yale. Sztul found the Palade lab “huge, intense, and exciting.” Palade was at the front edge of the emerging field of endocytosis and membrane trafficking. Sztul helped characterize the new pathway of transcytosis found in polarized cells.

While Palade was Sztul’s official mentor, she did much of her work under the guidance of Kathryn Howell, now at the University of Colorado School of Medicine. “Elizabeth was my first student,” says Howell, “She had good hands and an inquisitive quick mind. She was always involved in multiple projects at a time.”

Their relationship has evolved over the last 30 years into deep friendship. “Elizabeth is a colleague that I can discuss all aspects of science with. She is interested in so many things,” says Howell.

While still a graduate student, Sztul spent many months each year in Heidelberg, Germany, with Howell, who had joined the European Molecular Biology Laboratory there. Working in two labs on two continents gave Sztul insights into different approaches to cell biology research.

Sztul stayed on at Yale for a postdoc in human genetics with Leon Rosenberg. Again, Sztul was in on the ground floor of a new field—mitochondrial import of protein. Working on ornithine transcarbamylase deficiency was also her first experience with a basic process directly relevant to human disease. The mechanism by which that defective enzyme could result in devastating genetic disorder remains a central issue in her research and has led in recent years to her study of the ARF activator BIG2 in periventricular heterotopia.

In 1989, Sztul set out on her own, joining the department of molecular biology at Princeton as an assistant professor. There she focused her new lab on membrane trafficking, especially on the role of protein tethering factors.

“Elizabeth has made a ground-breaking discovery of vesicle tethering factor p115 and made key contributions to our understanding of how tethering facilitates the process of SNARE-mediated membrane fusion,” according to Vladimir Lupashin. He is a colleague in the

tethering field now at the University of Arkansas for Medical Sciences.

Sweet Home Alabama

In 1995, Sztul took a big step into the unknown by accepting an offer from the medical school of the University of Alabama. She had been recruited heavily, but Sztul remembers, “My first response was, ‘Where is Alabama?’ I’d always been in the Northeast, and Northeasterners often have a snobbish attitude. I know I did.”

Sztul finally accepted an invitation to visit, give a talk, and look around. At UAB, Sztul found world-class facilities and scientists set on making UAB a cutting-edge research institution. “I went and then I went again. And then I was hooked,” Sztul recalled. “Now it’s 14 years

later, and I know it was the right decision on every level—personal, scientific, and professional.”

Overcoming “coastal” snobbery is necessary to attract graduate students and postdocs to UAB she contends. It’s a problem familiar to other investigators in the middle of the U.S. Over time, Sztul developed “pipelines” to interested students in Poland and Argentina. Rafael Garcia-Mata was one of those. He heard Sztul speak at a protein trafficking workshop in Argentina and afterward accepted her invitation to attend UAB grad school.

Keeping Friends over Long Times and Distances

It was the right choice for Garcia-Mata. “I was very successful in my graduate studies, and I have to thank Elizabeth for that,” he reported. “She would make sure that you didn’t let any of your projects fade away.” He continued, “I really enjoyed working with her. She’s smart, excited, and always willing to stop everything to look at results or to go to the microscope with you.”

Garcia-Mata, who is transitioning to his first independent faculty position at the University of North Carolina, Chapel Hill, said that Sztul stayed in close touch throughout his postdoc. Sztul remains the ideal sympathetic but critical listener, according to Garcia-Mata. “Elizabeth was always very direct about what she thought, but always fair. She is very frank, but I really appreciate that now.”

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Sztul seems to have a knack for long-distance, long-term collaborations. She met Zoë Holloway during a 2000–2001 sabbatical at the Wellcome Trust in Oxford, UK. There Holloway works on Menkes disease, a rare genetic disorder affecting cellular copper metabolism. Their discussions of Menkes ATPase trafficking led to experiments, then data, and ultimately papers, the first of which appeared in 2007.

Keyboard Havoc

On her first visit to Birmingham to build the protein constructs at the center of their collaboration, Holloway discovered new sides to her friend's character—keyboard wrecker and vegetable gardener. “Apparently Elizabeth is renowned for going through computer keyboards,” Holloway said. “She has a whole shelf of keyboards, seven or eight of them that she proudly displays in her office. Elizabeth also grows the most amazing tomatoes, sweet potatoes, and cauliflowers.”

Before heading back to her lab and her garden in Birmingham, Sztul reflected on her year away in DC. “The great thing about NSF is the amazing swath of science that you are exposed to. Instead of just thinking about your itchy bitsy slice of the pie, you are forced to have the perspective of the whole cell. Maybe you don't have the whole pie but you have a much wider scientific vista.”

The NSF stint also had a personal benefit of allowing Sztul to see more of her son, who is now in law school in Baltimore: “I think even he enjoyed having me around now and then!”

Coincidentally, it was also the year in which Sztul ran successfully for a seat on the ASCB Council. “The ASCB is a very forward thinking, with-the-times, responsive society,” she explained. “It's also extremely well run, and I'm honored to be on Council.” She's been an ASCB member for 26 years, in good part because of its support for women in science.

Sztul ties the ASCB's efforts to her work back home with the UAB Commission on the Status of Women. In 2007, the Commission found that women were hemorrhaging from the promotion lines. This finding was consistent with the situation at other major U.S. universities.

“It's not good enough that we have increased hires of young women,” Sztul declared. The critical question is: “What is happening to the women entering our profession that we are still so underrepresented by the time we get to the professor level?” Especially for women in science, Sztul feels, “we all need to be more active in mentoring other women and to keep the gender moving forward.” ■

—John Fleischman

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