STaRS: Advancing Access to Biomedical Science Training

IN JULY OF 2012, THE NATIONAL Institutes of Health (NIH) issued an advisory report that recommended creating new research training models to increase diversity among the ranks of scientists. Three years earlier, Linda Hyman, PhD, associate provost of the Division of Graduate Medical Sciences (GMS), was ahead of the curve in piloting a program with Xavier University designed to help increase interest in and access to graduate programs in the biomedical sciences among underrepresented minorities.

Her early initiative is now a program—funded this year for the first time with a grant from the NIH National Health, Lung, and Blood Institute (NHLBI)—that welcomed 17 students from across the country to the Medical Campus. The Summer Training as Research Scholars (STaRS) program offers an introduction to graduate science education for talented undergraduates from minority groups traditionally underrepresented in the biomedical sciences including African American, Hispanic, Native American/Native Alaskan, and Pacific Island and Native Hawaiian students.

"Diversity breeds better science," says William Cruikshank, PhD, BUSM professor of medicine and assistant dean of diversity and multicultural affairs, who garnered the NHLBI funding and directs STaRS. "By increasing diversity and engaging those with different life experiences, different and better questions are asked that open up avenues for better research."

"We are very interested in increasing diversity in the biomedical sciences at BU and in general," notes Cruikshank, who is also director of the Molecular and Translational Medicine Graduate Program in the Department of Medicine and director of immunology at the Pulmonary Center. "One of the most effective ways to do that is to bring students to the Medical Campus, expose them to research, and get them excited about scientific discovery. We hope that when they finish up their undergraduate studies they will strongly consider applying to graduate programs in the biomedical sciences. In addition, we hope that as a result of their STaRS experience, they will include BUSM on their list of schools. It's really a dual mission: Increase the pipeline of minority students in the biomedical sciences and included in that, increase the pipeline of those students to BUSM." He also sees the program as a faculty recruiting tool, as one day these students may return to the University in that capacity.

The program is designed specifically to enhance the skills required for successfully entering and completing a graduate or MD/PhD program in the biomedical sciences. It offers motivated and academically talented students a hands-on, mentored opportunity to realize a strong interest in doctoral studies, particularly in the areas of heart, lung, and blood research. During the ten-week summer internship, students—or research scholars—are mentored in the laboratory by faculty and laboratory staff from GMS's doctoral departments and programs. Placements are aligned with their research interests. The research scholars are trained in the use of equipment and become familiar with the laboratory environment and routines. At the close of the program, students present their projects at a symposium.

With 400 applicants for the 13 funded positions, competition is strong. Four additional students, whose colleges were so enthusiastic about the STaRS program that they provided full support, were also accepted. "While a majority of those we accept are highly academically qualified, we also want to make a difference for students who are closer to the 3.0 GPA than the 4.0," Cruikshank says. "We accepted some students on the cusp because we want to promote, and help them get into, a program and the biomedical field. Our goal is to help them get over some hurdles and successfully apply for graduate school where otherwise they would either not apply or not have the credentials to be accepted."

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William Cruikshank, PhD, (center) with (from left) STaRS Program Administrator Lynese Wallace, Jennifer Leahy (MED'17), and Chino Igwebuike (MED'17).

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Research scholars receive a $4,800 stipend for STaRS participation, travel expenses to come to Boston, housing on the Charles River Campus with fellow summer scholars, and travel funds to attend a scientific meeting and present their research. They have the opportunity to participate in enrichment and professional development activities offered through GMS, departmental affiliations, and labs. Activities include the journal club, research seminars, science talks, and workshops focused on building specific career development skills. STaRS also offers opportunities for participants to explore Boston and meet like-minded students through the Charles River Campus summer term programs.

Considering the time and resource commitment the program requires, the faculty response has been tremendous, says Cruikshank. "They take their role as mentors very seriously," he says. "It is a time sink to train students with little or no experience, but they have a lot of desire and enthusiasm. We also have had great support from the GMS administration and from our graduate students and postdocs in all the departments."

"When I was accepted I was really excited. This is my first experience with research," Kailah Simon says. "It has been eye-opening and has swayed me a bit. My undergraduate work is in elementary education, but I decided to do a post baccalaureate program for pre-med. With the STaRS program, now my game plan probably will include doing an MD-PhD." Simon worked in the Pulmonary Center in Dr. Joseph Mizgerd's lab, studying the relationship between infection site and the ability of pneumococcus bacteria to activate macrophage NF-KB signaling in pneumonia.

"Kailah is exactly the type of student we are looking for," says Cruikshank. "Most students are familiar with clinician careers, but very few know what conducting research is all about. For Kailah, who is very smart and wants to be a doctor, this type of experience hopefully makes her aware that she can be a physician-scientist. In college science, your professor knows the answer; you go into the lab and conduct an experiment and you either do it correctly or you get the wrong answer. In research, we don't yet know the answer. In this program, we hope to instill in students the excitement of investigating and discovering something that no one has discovered before."

The word is spreading at BU. The Neuroscience Department approached Cruikshank to develop a program for them and they have submitted a grant for funding. "We also wrote into that proposal bringing some undergraduate faculty to the Medical Campus to spend 10 weeks in a neuroscience lab, then go back to their classrooms to present state-of-the-art ideas on neuroscience. We are looking for the faculty to spark an interest in college students and perhaps get them thinking about pursuing a research career in the field of neuroscience."

"Expanding the diversity of research scientists is vital to the pursuit of biomedical discovery, which in turn translates into the health of the public," says Hyman. "Dr. Cruikshank and the faculty engaged in this program have done a superb job. Even in the short time of 10 weeks, it is evident that the excellent exposure to biomedical research that the research scholars experience catalyzes and heightens their interest in the field. We all benefit from this." ■