



Next-Generation Scientists

EXPERIENCING THE REALITIES OF A RESEARCH LAB CAN BE LIFE-ALTERING FOR SOME STUDENTS.

WHEN SHEARMAN JABARI MILLER LOOKED AROUND THE BIOLOGY department during his undergraduate years at Georgia State University, he saw mostly white and Asian faces among the graduate students, postdocs, and professors.

But this summer the graduating senior and biology major, who is African American, took a step toward changing that picture, through HHMI’s Exceptional Research Opportunities Program (EXROP).

EXROP gives undergraduate students from groups underrepresented in the sciences or from disadvantaged backgrounds a chance to work in some of the world’s top research labs run by HHMI investigators and HHMI professors. Miller was one of 62 students selected this year to participate in EXROP, the largest group in the program’s seven years.

“Jabari has enormous potential as a scientist, and yet he has never been exposed to the kinds of opportunities that are available,” says Barbara Baumstark, a biochemist at Georgia State and the HHMI program director who nominated Miller for EXROP. “Now he will be.”

Since 2003, EXROP has placed 359 students from 97 colleges and universities in the labs of 130 HHMI investigators and HHMI professors. The hope is that students who experience the excitement and intensity of a top research lab and see other students like them doing the same thing will be inspired to one day become academic scientists—and serve as examples for others.

“I’ve experienced the positive impact that highly talented faculty from diverse backgrounds can have on students in science departments,” says Peter J. Bruns, HHMI’s vice president for grants

and special programs. “We desperately need more professors like that, and EXROP is part of that effort.”

So far, 189 EXROP students have completed their undergraduate degrees. Of those, 93 percent are still in science: 38 percent are pursuing a Ph.D. or M.D./Ph.D., and 29 percent an M.D. The remaining students are working as research technicians or science teachers, or are studying for a master’s degree.

EXROP’s talent scouts, as Bruns calls them, are the directors of HHMI’s undergraduate grants at colleges and universities across the country. They identify top students who could someday become academic leaders and who are ready for the challenge of working in an intense research environment, both academically and emotionally.

The program is popular among the HHMI lab hosts. Every year, more of these high-profile scientists volunteer to host students than are needed.

EXROP students Jabari Miller (right) and Alexandra Boye-Doe (left) shared stories with former EXROP student Ana Cristancho (center) at a program meeting at HHMI headquarters last May.

HHMI President Robert Tjian has hosted three EXROP students at his University of California, Berkeley, laboratory. “Working in a lab as a college sophomore really is the thing that got me into science, so I can’t imagine a more interesting pathway for students to understand what real research is about,” he says. “And EXROP is special ... You could be anywhere, and if you show some promise you could end up in one of the best labs in the world.”

Miller, 22, is just one of those students. Inspired by Bill Nye the Science Guy, Miller grew up loving science, but his high school in Atlanta didn’t provide many opportunities. “We didn’t really have any labs, just bookwork,” he explains.

Despite that, Miller decided to major in biology at Georgia State. Though he struggled through required physics and chemistry courses, his professors recognized his talents and recruited him into an HHMI-sponsored biotechnology program. He worked in a research lab studying how bacteria change their genes in response to the environment. That experience lit his fire.

In June, Miller joined the lab of HHMI investigator David G. Schatz at the Yale School of Medicine, who studies how the immune system makes antibodies that fight invading pathogens. Schatz has hosted three previous EXROP students, all of whom have gone on to graduate school in some field of science. “These are serious kids who want to learn and want to make a difference, so they come in ready to work,” Schatz says. “They have been fun to work with and they have been productive.”

The EXROP program has almost doubled in size since its beginning, and the Institute continues to consider ways to grow the program while maintaining the factors that make it successful.

Miller says he was excited to have the opportunity this summer to learn a new subject and new techniques, and to meet people who have the same interests and background. “I used to hate school,” says Miller, who is beginning a master’s degree program in biotechnology at Georgia State this fall. “Now I can’t get enough of learning about biology.” ■ —ANDREA WIDENER

HHMI Gives Research Training Awards

IN 1985, THE HOWARD HUGHES MEDICAL INSTITUTE first gave medical students the chance to spend a year working in a research lab on the Bethesda campus of the National Institutes of Health (NIH).

Twenty-five years and more than 2,000 students later, HHMI remains committed to encouraging medical students, including dental and veterinary students, to hone their scientific skills and prepare for possible careers in research. This year, 112 students from 44 institutions will spend a year in the laboratory, either at the NIH through the HHMI–NIH Research Scholars Program or at a research center anywhere else in the United States through the HHMI Research Training Fellowships Program. This year, HHMI has joined in a partnership with the Ben and Catherine Ivy Foundation to support four HHMI–Ivy research training fellows who are studying glioma, a deadly and incurable brain cancer.

“These programs give the students a chance to immerse themselves in research,” says Peter J. Bruns, HHMI’s vice president for grants and special programs. “For many, this will be a pivotal experience that helps them decide whether to pursue a career in research.” And many do: nearly 45 percent of alumni are still doing research 15 years or more after participating in the scholars or fellows program.

Scholars and fellows who pursue an academic research career have a chance for more HHMI support. Since 2006, former fellows and scholars have been eligible for Early Career Physician-Scientist awards, grants totaling \$375,000 over five years. The funds help these researchers set up their labs and commit to science at a vulnerable time in their careers, when many are pushed to abandon research so they can spend more time seeing patients.

More than 50 physician-scientists have received HHMI support through the program. And it appears to be working—among the 2006 award recipients half of them later successfully competed for an RO1 award, the NIH’s main research funding vehicle. This year, 11 new early career physician-scientists from seven institutions were chosen, with research interests ranging from cancer to obesity to autoimmune diseases. ■ —ANDREA WIDENER

FOR MORE INFORMATION: To learn more about the new HHMI–NIH research scholars, visit www.hhmi.org/news/20090507/scholarsfellows.html. For more on the new early career physician-scientist awardees, go to www.hhmi.org/news/ecs20090707.html.