

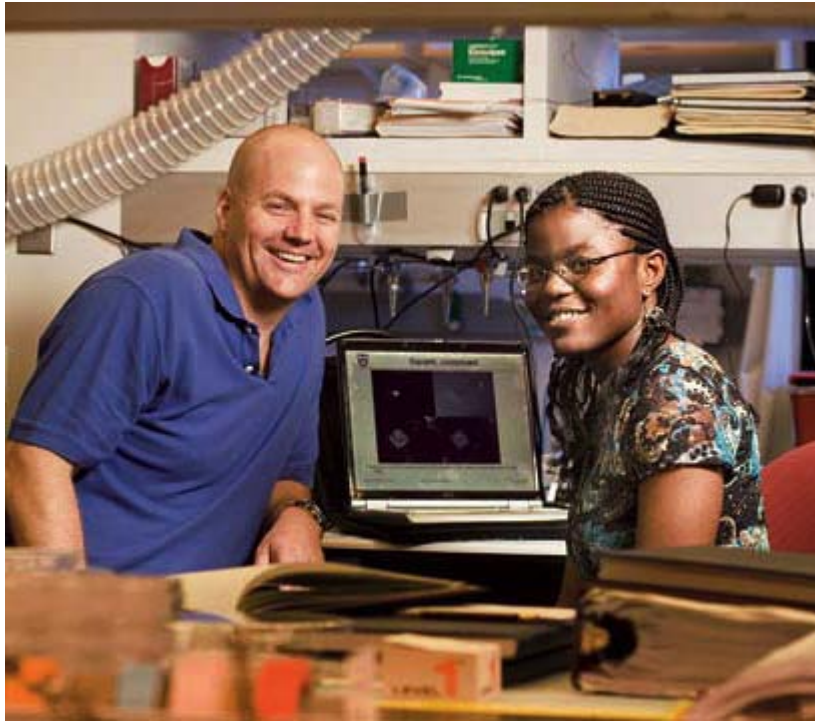
Supporting Young Scientists

What does it mean to be part of a community of scientists? For Chimdimma (“Chi-Chi”) Esimai ’08, it meant, for one thing, having a ready group of basketball opponents. On a typical evening this summer, Esimai finished work in the Engineering Sciences Laboratory by 5:30. She rushed back from 40 Oxford Street, grabbed a quick dinner, and headed to Hemenway Gymnasium to face off against a group of aspiring physicists, biochemists, and mathematicians. Her opponents, all undergraduates, were participants in the College’s initial Program for Research in Science and Engineering (PRISE), a 10-week residential fellowship for students with summer jobs in the labs of Harvard-affiliated faculty members (www.priselink.harvard.edu). The 119 male and female PRISE fellows lived together in Leverett House and shared dinners in the Dudley House dining hall. “It’s been awesome having a set of friends with something so intensely in common,” Esimai said recently. “They’re scientists, but they’re also fun people.”

Summer lab work in Cambridge wasn’t always so cozy. In the past, students who managed to find both funding and a research position had to go through the added hassle of arranging their own housing, meals, and transportation. Once at work, the long hours and detail-oriented tasks could be isolating. “You think, ‘How do I find a system of support when I’m in lab 10 or 12 hours a day?’” said chemistry concentrator M. Patricia Li ’07, another PRISE fellow. “For a lot of people, it was easier to work at home, or go abroad for the same cost.”

PRISE, begun at the behest of the Task Force on Women in Science and Engineering, aims to make summers spent working in Harvard labs into a smoother experience—with the ultimate goal of diversifying the group that stays in the “pipeline” and goes on to scientific careers. In its May 2005 report (see "[Developing a Diverse Faculty](#)" and "[Engineering Equity](#)," July-August 2005, page 55), the task force cited studies showing that a positive research experience can be decisive in persuading students to pursue more advanced degrees. Simply by providing housing and meals, PRISE makes it easier for students to stay in Cambridge over the summer. But more than that, it’s intended to improve quality of life, says Fiona Chin ’02, a PRISE steering committee member and project manager in the Office of Faculty Development and Diversity, which is funding the program for its first three years. “It’s not just about the lab work or the experiments,

but about the culture of what it's like to be in science," explains Chin, a former biology concentrator. "There's a stigma about lab research that says you're lonely and stuck on a lab bench. But a career in science can be exciting. We want to help give students access to a broader science community."



Mentor and student: Kevin Parker and Chimdimnma Esimai at work in his laboratory during the first summer PRISE program.

Photograph by Jim Harrison

Esimai, who also considered concentrating in Spanish, said she couldn't "remember a time when I was not interested in science." Born in Nigeria and raised in Texas, she used to spend time in the public library reading art and geometry books. "I'm not a hard-core science person," she said. "I've been interested in the artistic expression of the sciences."

That's why her lab work felt like such a lucky coincidence. She met Kevin "Kit" Parker, assistant professor of biomedical engineering, when she was having dinner in Annenberg; he makes a habit of introducing himself to students. "He came up and said 'Hi.' I'd just met him, but he told me he did engineering, and I e-mailed him afterwards and said, 'Can I work for you?' And he said yes." That was in the spring of her freshman year. This summer, she spent her second year in Parker's lab (which specializes in solid-tissue engineering) studying transduction and signaling pathways in the heart. That brought her

back to geometry: using a process called “soft lithography,” she stamped cells into various shapes—triangles, rectangles, and squares—to explore how their functions changed based on their shape. The lab work was a turning point: “It helped me entertain the idea of a career in research more,” Esimai said. And being in PRISE showed her how she would manage that career. “I now know the things I need to do to stay sane—like leaving to go play basketball.”

Although PRISE was created specifically to support women and minorities, organizers say a range of undergraduates will benefit from its built-in community. For the most part, the fellows, culled from a pool of more than 200, had already secured laboratory jobs, like Esimai, by the time they applied. “The mix we got was very organic,” reports program director Gregory A. Llacer, who is also assistant director of fellowships at the Office of Career Services. The admissions group (made up of three steering-committee members and three faculty members) selected students based on grades, references, and most importantly, essays describing their interest in PRISE. The first cohort turned out to have slightly more women—68, versus 51 men—from all three returning class years, sophomore to senior. “It’s a diverse community, parsed in any way,” Llacer adds, “by gender, ethnicity, year, even degree of academic success. We weren’t looking for any specific criteria. We were looking for people who could benefit from or contribute to the community.” The students worked in fields ranging from biochemistry to computer science. Organizers are counting on them to form their own group identity, to help inject new energy into the sciences this fall. “We need to piggyback on the enthusiasm of this first group,” Llacer says, to keep the program going in future years.

In the Dudley dining hall, that enthusiasm seemed palpable. Students wandered from table to table greeting each other familiarly. “These are people you see during the school year, and you think, ‘I don’t have the time to get to know them,’” said Esimai. But because some of the trials of laboratory work—such as disappointing results—are universal, the new summer relationships became a source of moral support. “It’s easier living with students who are doing laboratory work, because they are going through the same thing,” noted Esimai, whose roommates during the school year were amazed when she skipped a movie to go back to the lab. “Here, everybody was doing it. If you really want to be a scientist, you’re going to stick with it.” In their free time, PRISE students came together for group activities, including trips to see the musical *Rent* and a whale-

watching expedition. They had a full schedule of evening programs: workshops tackled practical issues, like applying for fellowships, and a series of scholars, such as Nobel laureate and Baird research professor of science Dudley Herschbach, came to speak at open forums. The students themselves took the stage at the end of the summer to present their research.

For Howard Georgi, Mallinckrodt professor of physics and a member of PRISE's advisory committee, creating the program was "an obvious thing to do." The emphasis on community dovetails with a larger movement in the sciences toward interdisciplinary work, evident in the newly formed life-sciences curriculum with its interdisciplinary courses, Life Sciences 1a and 1b (see "The Excitement of Science," July-August, page 56). "[PRISE] helps get across the fact that science is a group activity," Georgi says. "It will produce lots of discussions between people in slightly different areas. It's the kind of thing that goes on in real science."

The discussions across disciplines quickly took place. A week into the program, Arun Thottumkara '08, a chemistry concentrator who worked in an organic chemistry lab, found himself embroiled in a dinner-table debate about how to treat HIV/AIDS. "We were arguing over whether it should be treated as a social or scientific problem," he said. The biologists argued that social measures were the best way to fight AIDS, while Thottumkara was convinced that "if you target the heart of the problem, you have to go to the science, coming up with new drugs or a cure." In the end, he came away moved: "They asked, 'If you're going to spend all your money and time on a cure or better drugs, what happens to people in the meantime?' That argument was pretty compelling." Thottumkara was impressed when a math concentrator entered the conversation armed with statistics: "It's pretty engaging when someone can give you hard numbers."

Whatever their personal experiences, the first group of PRISE participants are also serving as guinea pigs, testing the theories behind the program's creation. They are participating in surveys, run by an outside assessor, that will chart how their career choices and attitudes about science develop over time. The students were surveyed once when the program ended, and they will be questioned again every few years. The feedback will shape the PRISE's future, Llacer says: "We can follow this cohort and see whether, down the road, they really felt a program like this was of value to them."

And at least a few PRISE fellows already seem to have long-term ambitions. In a July workshop on public speaking, the Bok Center's Rebekah Maggor led the students in an exercise on using memorable language to discuss their research. Scott Kominers '09, a mathematics concentrator, came up with a vivid metaphor to explain his work on lattice field theory to his partner, Christina Tartaglia '09, a molecular and cellular biology student. "Imagine that all these numbers in the lattice are shells on a beach," he said. "What I'm doing is trying to classify all of them, in hopes of finding the perfect two shells that fit exactly together." After the exercise, Maggor regained the crowd's attention by asking when a scientist needs to speak in public. There was a hesitation. "Receiving the Nobel Prize?" someone suggested. The students murmured approval. "That's good," Maggor agreed, "but you need to concentrate on your end-of-the-summer presentations first."

~Elizabeth S. Widdicombe