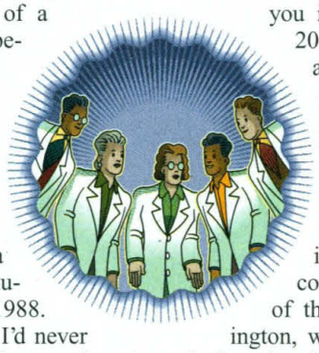
up the most exciting collaboration I could imagine, rather than a process of hunting for an advertised job," says McCandliss. "People who wait and answer general ads for postdocs can wind up working on a preexisting project and have less of a hand in designing the whole experience."

Another high achiever who strayed off the beaten track is 32-year-old computer scientist Michael Littman, an assistant professor at Duke University, who pursued what he now calls a "predoc." He spent 4 years as a researcher at Bellcore after graduating from Yale University in 1988. "My family was convinced that I'd never go back to school," he says. But the experience allowed him to discover his real interests, laying a solid foundation that "helped me go through my Ph.D. faster." It also served the function of a regular postdoc: His current lines of research—artificial intelligence and cross-language information retrieval—"both have their roots in my time at Bellcore."



ATTRIBUTE #8: Be a team player

"Your accomplishments can get you into the top 20 out of 200," says Martin. "But after that any one of those top 20 can do the job well." At that point, it's the nuances that count—and that's where the interpersonal part comes in. Groh is a good example, according to Mike Shadlen of the University of Washington, who did a postdoc with her. Groh, who does experimental work with humans and monkeys on how visual and auditory signals combine and generate behavioral responses, is "extremely generous and kind-spirited," says Shadlen. She's "very open with her ideas—enthusiastic, willing to engage, willing to be wrong. She's the kind of person you want to hire in your lab."

Groh, who also has an impressive pedigree—she worked with David Sparks at the University of Pennsylvania and did a postdoc with William Newsome at Stanford University—makes it clear that interpersonal skills have to include savvy as well as nice. When she interviewed for a postdoc, she asked people about the atmosphere in the lab and whether there were any hidden conflicts. And she expects people applying to her lab to do the same. Her combination of attributes won her nine job offers while a postdoc, including a $1 million start-up offer—four times the norm—from The Rockefeller University, which she turned down because she and her husband were looking for jobs in the same place.

Following all these rules doesn't guarantee you the job of your dreams, of course. But ignore them at your peril, say those former postdocs who have found them helpful in achieving success at a young age.

–CONSTANCE HOLDEN

NEWS

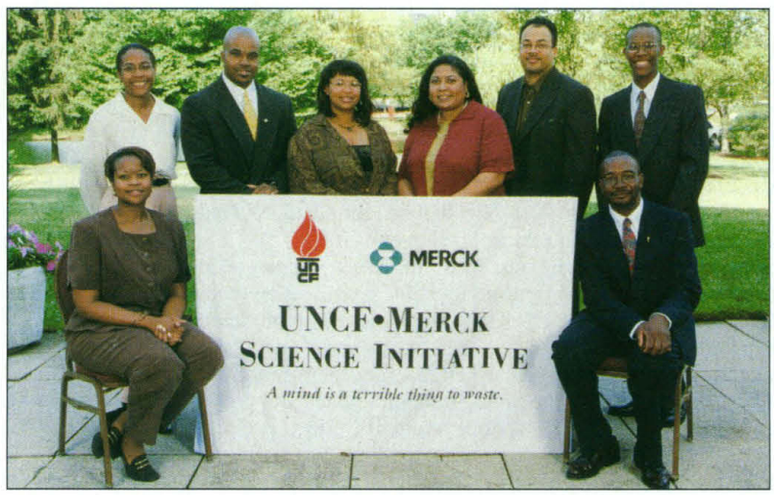
Minority Postdocs Are Rare, Independent Breed

The tiny number of minority postdocs suggests that the problem starts at the beginning of the pipeline. Still, very little is being done to plug the leaks near the end, where careers are meant to blossom

For the past 3 years, 10 talented U.S. African Americans have won a biomedical postdoctoral fellowship under a program funded by pharmaceutical giant Merck & Co. and administered by the United Negro College Fund (UNCF). This year, the program will expand to 14 awardees, thanks to additional funding from another drug company, Parke-Davis. It doesn't sound like much until UNCF's director of science education, Jerry Bryant, tells the rest of the story: "By my estimation there are only 124 African Americans currently doing postdocs in the biomedical fields who are U.S. citizens or permanent residents. And we're funding a significant proportion of them."

Minorities are rare in science all along the educational pipeline, but by the postdoctoral level the factors that pluck African Americans, Hispanics, and Native Americans out of science have shrunk the pool to vanishingly low numbers. And because the best way to change the situation is to boost the numbers entering the pipeline—reaching back to high school and even elementary school—minority postdocs haven't gotten much attention. Proponents of these special programs argue that their tiny numbers make each minority postdoc precious and that focusing attention on them is the best way to encourage others to follow in their footsteps. But the vast majority of scientists seem to feel that the scarcity of underrepresented minorities is not an issue that should be addressed at the postdoc level, where performance is all that matters.

Even tracking the numbers of minority postdocs is difficult. Although African Americans, Hispanics, and Native Americans make up 24% of the U.S. population and graduate from high school at rates close to those of whites, they receive only about 14% of the undergraduate science and engineering degrees and only 7% of science and engineering Ph.D.s. By the time they become postdocs, their numbers are so small that the National Science Foundation (NSF), in its regular survey, doesn't even collect data by race; hence Bryant's estimate is based on a rule of thumb that the postdoc population in biomedical fields is roughly twice the number who earn Ph.D.s annually in those fields. Surveys that follow the fate of Ph.D.s likewise come up empty when tracking minorities. A Berkeley study that tracked down 654 biochemists 10 years after their Ph.D., for example, contains replies from only nine Latinos, four African Americans, and no



Postdoc partners. This year's class of Merck-UNCF postdoctoral fellows constitutes a significant fraction of new African-American biomedical postdocs.

CREDIT: (BOTTOM) MERCK & CO.

Native Americans.

Those tiny numbers, plus the ambiguous status of postdocs at most institutions, also make it very difficult to track the impact of the few programs aimed at underrepresented minority postdocs. The National Institute of Allergy and Infectious Diseases (NIAID) in Bethesda, Maryland, for example, gives its intramural scientists an extra postdoc slot in their labs if they bring on a promising minority. Richard Asofsky, a training officer who oversees the program, says he's recruited about a dozen minority scientists that way in the past 5 years. That's quite an accomplishment, he asserts, given that there were "maybe two" minority postdocs among the more than 200 at the institute when the program began. Exact figures do not exist because the National Institutes of Health (NIH), NIAID's parent body, doesn't keep data on the racial composition of the 2230 postdocs on campus. Such data are only required for employees, and postdocs are considered trainees, explains Richard Wyatt, executive officer for intramural research at NIH. "Quantification is a problem for us," he admits.

But the problem is not simply one of counting heads. NIAID's active outreach is not part of an NIH-wide strategy. Rather, it's an outgrowth of a commitment by NIAID director Anthony Fauci, backed by the tireless efforts of Milton Hernandez, Asofsky's counterpart in the extramural research program. A cardiovascular physiologist who came to NIH in 1988 from Howard University Medical School in Washington, D.C., Hernandez takes the numbers personally: "I'm a Chicano from Texas, and when I got my Ph.D. in 1971 I knew every Chicano in U.S. medicine because there were less than 20 of us. Even today I would guess there's not more than 80."

Hernandez promotes the careers of talented minority students by combining his responsibilities as the institute's training officer, its coordinator of minority supplements to investigators with existing grants, and the head of its minority predoctoral fellowship program. He says such triple duty "puts me in a unique position" among administrators at NIH's 25 institutes and centers to track the minority talent pool from grad school on up.

That personal touch is also in evidence at NSF, which offers one program to support minority postdocs in the biological sciences. It was begun a decade ago by George Langford, now a biology professor at Dartmouth College and a member of NSF's governing National Science Board, who saw a need for more minorities in academia and who persuaded his bosses within the biology directorate to back his idea. Despite its longevity, it has never spread to NSF's five other research directorates or to the education directorate, and the current program officer, Carter Kimsey, admits that she tries to keep "a low profile" in an effort to avoid upsetting foes of affirmative action. Last year those critics forced NSF to drop the minority component of its graduate research fellowships; they had already succeeded in getting NIH and NSF to cancel two precollege summer programs aimed at minority students (*Science*, 2 January 1998, p. 22).

Both current postdoc programs are run so quietly that they are often a secret even to those trying to expand the number of minority scientists—as well as to the target population. Physiological ecologist Robert Jackson is Web master for a site that lists career resources for members of his professional society, including opportunities for minorities (www.botany.duke.edu/jackson/ecophys). But Jackson, an assistant professor of botany at Duke University who is white, was taken aback when a reporter told him this summer about the 10-year-old NSF program. "I never knew it existed, and neither did another NSF program manager whom I asked," says Jackson. Likewise for Ghislaine Mayer, a Haitian-born cell biologist, who starts work this month at NIAID in Louis Miller's laboratory of parasitic diseases after graduating this summer from the Albert Einstein College of Medicine. "I'm familiar with other minority programs," she says. "I just didn't know that NIH had one for postdocs. And I didn't know I was part of it."

> **"[Diversity is] not something that's addressed when it comes to hiring [postdocs]. ... It falls between the cracks."**
>
> **—Theresa Compton**

In fact, most researchers don't think such minority postdoc programs are needed, and few universities promote them. University administrators are "very hands-on" when it comes to promoting diversity among undergraduates and professional school students, says biologist David Burgess, academic vice president and dean of faculty at Boston College, who is also president of the Society for the Advancement of Chicano and Native American Scientists. "But those same administrators traditionally have been entirely hands-off on graduate admissions and the hiring of postdocs. Which is ironic, of course, because that's the future of academic science."

That "tradition" may grow from the fact that postdocs are hired by researchers themselves, and that most scientists believe an effort to take race into account would distort the process of hiring the most qualified candidates. "We definitely try to recruit the best minority students," says Cliff Tabin, a professor of genetics at Harvard Medical School in Boston and co-director of the school's graduate program, "and on a faculty level we think it's important to have role models for minority students." But when it comes to postdocs, he says, "to me diversity means having someone in my lab who's a biochemist, a virologist, who does surgery on embryos, and who works with *Drosophila*. Having people from different countries and cultures is nice, too. But I don't pay attention to race."

Tabin and other faculty members believe strongly that increasing the number of underrepresented minorities "is everyone's business." But they don't see it applying to postdocs. "That's not something that's addressed when it comes to hiring them," says Theresa Compton, a virologist at the University of Wisconsin, Madison, medical school. "I think it falls between the cracks."

Asofsky certainly doesn't dispute the importance of scientific excellence in choosing postdocs. But he'd like to see scientists move beyond "thinking about checkable boxes" when they weigh an applicant's merits, a practice that he and others say favors those students with the best academic pedigrees: "The problem is that most scientists without experience working with Ph.D.s from lesser known schools don't have a clue how to assess their talents." Rice University mathematician Richard Tapia, who trains a large number of minority and women Ph.D.s, says he's struggled to place many of his students in top labs for that very reason. "They don't look as good on paper as somebody from Berkeley or Harvard," he says. "But the standard criteria don't reflect what they have had to overcome or their determination to succeed."

Hernandez may be one of the few science administrators who probe those cracks for hidden scientific talent. And he wishes he had more company. "It doesn't require a lot of time, but you need to make the commitment," he says. The solution is equally obvious for minorities, he adds. "They need to finish [school], and then they need people like me to help them connect. That's all it takes."

–JEFFREY MERVIS