

# Nurturing Women Scientists

Nationwide and institution-sized surveys show a leaky pipeline partially patched, but the reservoir still far from full. **By Jill U. Adams**

**W**hen the US National Institutes of Health (NIH) surveyed its postdoctoral fellows in 2003, more than 1,300 of them answered questions ranging from marital and family status to their views on the value of a good salary, flexible hours, and other workplace issues. One result was particularly worrying. While women and men both felt equally well trained for a career in academic science, women were less confident about their chances to land a position, much less achieve tenure.

**Elisabeth Martinez**, who was a postdoc at the time and helped design the above survey, expected preparedness and career outlook to be in alignment. With her task force colleagues, Martinez, now an instructor at the University of Texas Southwestern Medical Center, predicted that women might feel less ready—but they didn't. "By and large women felt equally well prepared, and yet there was still a bit of a confidence issue," she said.

This finding bodes poorly for efforts to close the gender gap in representation at higher levels of the academic ladder. And yet, those involved in such efforts—in academia, government, and industry—continue to move forward, casting a wider net for hiring, pushing family-friendly initiatives, and increasing the emphasis on mentoring.

"It is reasonable to assume that those women who have assessed the situation carefully recognize that they're going to have more problems than men," says **Phoebe Leboy**, the president-elect of the Association of Women in Science (AWIS). "So you can call it lack of confidence or you can call it an accurate perception of the situation."

One reason women might have grounds for less confidence in their careers than men has to do with the pressures of raising a family, says Leboy. But even putting family issues aside, she says, "Women are going to have a harder time than men succeeding" at every stage of the tenure-track academic career.

Leboy points to data made available by the NIH that showed women lagging behind men in terms of grants per investigator, dollars per grant, success in getting grants renewed, and responsibility for big budget center grants. And because success is so closely tied to funding, particularly in academic health centers, says Leboy, all of these things mean that women are having a harder time achieving tenure than men.

Add all this to what Leboy calls "the escalating rat race in academia" and it paints a bleak picture.

## Looking Past the Numbers

It's no longer a pipeline issue, says **Nancy Nielsen**, president-elect of the American Medical Association. She cites the National Academy of Sciences (NAS) report from last year which showed that although women have earned more than half of the Bachelor's degrees awarded in science and engineering since the year 2000, their representation on university faculties remains woefully low. Indeed, for those with Ph.D.s in engineering and science, four times more men than women hold full-time faculty positions. And minority women with doctorates are less likely than white women, or men of any racial or ethnic group, to be in tenure positions.

It's a problem of numbers, but as is so often the case, numbers do not tell the whole story. A survey of faculty at Princeton five years ago looked at promotion, compensation, and retention by gender. "The major finding was that we have made progress in attracting and retaining women faculty," said **Joan Girus**, a psychology professor who serves as a special assistant to the dean of faculty, a post that was created as a direct recommendation of the survey's task force. "But, we still found that **continued** »



Elisabeth Martinez

“By and large women felt equally well prepared and yet there was still a bit of a confidence issue.”



Phoebe Leboy

## UPCOMING FEATURES

Postdoctoral Scientists 1—February 22

Careers in Preclinical Drug Discovery and Development (online only)—March 7

Focus on Asia —March 21

Women in Science

“We put programs into place, not just to have a program, but so it will actually benefit employees. We do these things because we believe it’s right.”

— Lisa Zanetto



women were underrepresented.”

When the Princeton survey team looked beyond the quantitative data, one thing they found was that women were less likely to request extensions of tenure for childbirth than were men. “Now this is really odd, right?” Girgus said. “When we asked people to comment, they said things like: we don’t know if it’s okay to ask for it, we’re afraid we’ll be seen as less serious, we’re afraid we’ll be penalized in the tenure consideration.”

Princeton’s response? Make the extension of the tenure clock automatic. When a tenure-track faculty member, male or female, brings a new child home, the dean of faculty sends a letter with a new tenure date and a book for the baby, said Girgus.

In addition to the postdoc study run by Martinez, the NIH conducted an extensive survey of its tenure-track and tenured scientists (as well as other staffers) to examine gender issues. In general, “women do not perceive the NIH as a female-friendly environment,” said **Joan Schwartz**, an Assistant Director in the Office of Intramural Research. “But to tell you the truth we don’t know how exactly to define that because we didn’t ask them what they meant by it.”

Schwartz is presently conducting followup focus groups on the same populations to try to get at specifics. “We need to understand what the issues are so we can work on coming up with solutions,” she said. “That’s the ultimate goal—to develop practical solutions.”

**Beyond Education and Training**

Obviously, progress has been made. One success story found in the NAS report is the number of women getting Ph.D.s in science and engineering. In biomedical science, some 45 percent of postdoctoral fellows are women. As the problem—women leaving science or their careers stalling—moves to a later juncture on the career path, the solutions must be tailored to a different set of circumstances.

Put a different way, the problem of equal representation of women has moved from the education and training realm to the employment realm. Academic science might look no further than corporate America to find expertise in the practices of hiring, career development, and family-friendly policies.

“Attention to career development and advancement is more part of the culture of industry than it is in academia,” says **Gail Cassell**, who is vice president of scientific affairs at Eli Lilly and Company and was previously a department chair in microbiology at University of Alabama Schools of Medicine and Dentistry at Birmingham. “Lilly certainly invests a lot of time and resources in nurturing the careers of females in both technical and management positions.”

Employees at Eli Lilly undergo evaluations twice a year and, in

addition to being evaluated by their bosses, those in supervisory positions receive performance reviews from peers and the people they manage. With multiple inputs going into an employee’s review, the process is more objective than the opinion of a single person, like one’s boss. This continual feedback “improves the individual, improves the system, and builds a better relationship between employee and employer,” says Cassell.

From an employer’s perspective, evaluations help identify talent and hold onto it. “So you don’t turn around and they’re being courted by one of your competitors. Succession planning is a very important part of human resources here. I’m not so sure that’s the case at universities, particularly with administrative positions.”

**Kourtney Davis**, senior director of worldwide epidemiology at GlaxoSmithKline, can speak to her company’s helping her meet her objectives. Earlier this year, she co-chaired a women in science program that pulled together women across the whole R&D organization to offer networking and mentoring. Davis says it was a great chance to promote opportunities for women. “It was also on my development plan, because I want to work on leadership outside of my department.” She credits the company’s human resources team for trying to find opportunities for women scientists to increase their leadership skills.

With regard to family-friendly policies, both GlaxoSmithKline and Eli Lilly were recognized by *Working Mother* magazine as two of the top 100 companies in America, based on measures of work force, compensation, child care, leave policies, and the like.

Davis jokes that she’s a poster child for the company’s family-friendly programs. With each of her two children, Davis took advantage of extended leave—time beyond paid maternity leave—and then came back at reduced hours for another three to six months. “I also telecommute one day a week,” she says. “My supervisor has been incredibly supportive.”

The biotech firm Genencor has gone so far as to provide a lactation room and the services of a lactation consultant, says **Lisa Zanetto**, director of human resources for R&D. Employees at **continued »**

**American Medical Association**  
www.ama-assn.org

**Princeton University**  
www.princeton.edu

**Association of Women in Science (AWIS)**  
www.awis.org

**Rensselaer Polytechnic Institute**  
www.rpi.edu

**Eli Lilly and Company**  
www.lilly.com

**University of Alabama, Birmingham**  
www.uab.edu

**Genencor**  
www.genencor.com

**University at Buffalo School of Medicine and Biomedical Sciences**  
www.smbbs.buffalo.edu

**GlaxoSmithKline**  
www.gsk.com

**National Institutes of Health (NIH)**  
www.nih.gov

**University of Texas Southwestern Medical Center**  
www.utsouthwestern.edu

**National Science Foundation**  
www.nsf.gov

Women in Science

the company also take advantage of flextime schedules, backup day care, and using sick days to take care of sick children.

Zanetto notes that men use family-friendly policies too, like the single dad who works a reduced-hour schedule. The philosophy behind these programs is based on the belief that employees are the company's greatest asset. "We put programs into place, not just to have a program, but so it will actually benefit employees," she says. "We do these things because we believe it's right."

Eli Lilly's commitment to diversity has led the company to create a new position, a vice president of diversity. The company also helped fund the NAS report on academic science and has encouraged the academy to do a followup study on women scientists and engineers in industry.

"With our scientific talent pool being what it is today around the globe, you want that diversity to ensure success," Cassell says. "You have to have it."

Changing Culture

Industry differs from academia in how achievement is measured. "In industry, as in much of corporate America, rewards are considered for the team, for how the team does," says Nielsen, which affects not only how science is done, but how scientists are judged.

By contrast, the emphasis in academia is on individual achievement. That works against women, says Nielsen, who adds that for all the talk about partners sharing home and family duties, "the reality is women still do the brunt of that."

Nielsen, who is senior associate dean for medical education at the University at Buffalo School of Medicine and Biomedical Sciences, illustrates the contrast with a change she's witnessed in clinical medicine. Thirty years ago obstetrics and gynecology was dominated by men, but now the majority of residents in any OB/GYN program are women, she says. "I think it was because the life of an OB/GYN being on call all the time was very difficult. In the old days solo practice was the model." Now group practice is more common and allows doctors in a large group to have a very reasonable call schedule. "They can have a life," says Nielsen. "And those are issues for my medical students, male and female. They want a reasonable life balance."

Several universities have launched initiatives to change the culture of academic science and to increase the representation of women on the faculty at the highest ranks. The National Science Foundation has been funding many of these efforts through its ADVANCE program. One of the first awardees was the University of Wisconsin at Madison. "The unique thing about these awards is they're really working on the institution level," says Jennifer Sheridan, who directs UW-Madison's Women in Science and Engineering Leadership Institute. "This kind of money has never been put at the top, at



"You cannot presume to have tapped the best talent if you do not tap the complete talent pool."

—Shirley Ann Jackson, right

a system level before. It's always been a 'fix-the-women' approach."

One of UW-Madison's approaches is to educate faculty—those who serve on hiring and tenure committees—about research-based evidence on unconscious bias. Studies have shown that identical resumes are perceived differently depending on the gender of the name at the top. "We use the research as a way in," says Sheridan, to persuade science faculty that if they're not paying attention, these biases can emerge. "It takes the blame off men," she says, "because women do it, too."

The hiring workshops have been effective at Wisconsin, says Sheridan, who has measured a positive correlation between departmental participation in hiring workshops and more women hired. In addition, responses on climate surveys showed that new hires were more satisfied with the hiring process. "The workshops talk a lot about the interview process and treating candidates respectfully," she says.

Another NSF grantee is Rensselaer Polytechnic Institute, which has created a program called RAMP-UP (Reforming Advancement Processes through University Professions). Rensselaer President **Shirley Ann Jackson** said the program is focused on two things: "We are working to improve career progression for women from the junior faculty ranks to the senior ranks, and to expand recruitment of accomplished women at the senior level."

Startup packages and access to resources will be looked at more carefully. In addition, the institute is expanding its mentoring and coaching services to better guide women faculty through the advancement process.

"It starts at the departmental level, because that is where hiring starts and where the promotion and tenure process occurs," Jackson said. In addition, the "tone at the top" is important, she says. "It is essential to set clear expectations. I am very focused on the need to ensure that the processes affecting the progression of women faculty—and of all people in their careers here at Rensselaer—are fair and consistent."

To fill looming gaps in the science, technology, engineering and mathematics (STEM) work force, Jackson says the United States must engage more women and minorities. "Demographics are changing. Women and minorities now constitute one-half to two-thirds of the population, yet they have traditionally been underrepresented in the STEM fields. If we are to sustain our capacity for innovation, it must be an all-in proposition. You cannot presume to have tapped the best talent if you do not tap the complete talent pool."

*Jill U. Adams is a freelance writer living in upstate New York.*

DOI: 10.1126/science.opms.r0800047