

ENCOURAGING YOUNG SCIENTISTS

NAS workshop looks for ways to help early-career investigators get first NIH grant

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FOR RESEARCHERS JUST BEGINNING a career in the life sciences, winning a research project grant from the National Institutes of Health is high on their lists of priorities. Often these traditional investigator-initiated, or R01, grants serve as a measure of independence, which weighs heavily in tenure evaluations.

Winning these grants in the early stages of one's career is often difficult, however—a fact that has not gone unnoticed by NIH. The agency has attempted to address the problem through various funding mechanisms in the past and is now seeking input from a National Academy of Sciences panel. The Bridges to Independence committee is tasked with helping NIH find new ways to fund young researchers. To that end, the panel held an information-gathering workshop on June 16 in Washington, D.C.

"We have the opportunity to make what is currently a great system even better," said Thomas R. Cech, committee chairman and president of the Howard Hughes Medical Institute. He noted that the panel was looking for both anecdotes and hard statistics to help understand how best to help young investigators succeed in the NIH grant system.

According to Cech, there are several challenges to address. First, many post-docs don't feel like they are on a "career track," nor are they mentored for independence, he explained. Also, within the NIH grant system, the average age at which researchers receive their first grant is increasing, he noted. And finally, he said, the current system inhibits exploration and risk taking in young scientists.

It's this last challenge that is the biggest concern to NIH Director Elias A. Zerhouni. In his remarks to the panel, Zerhouni stressed the importance of creating

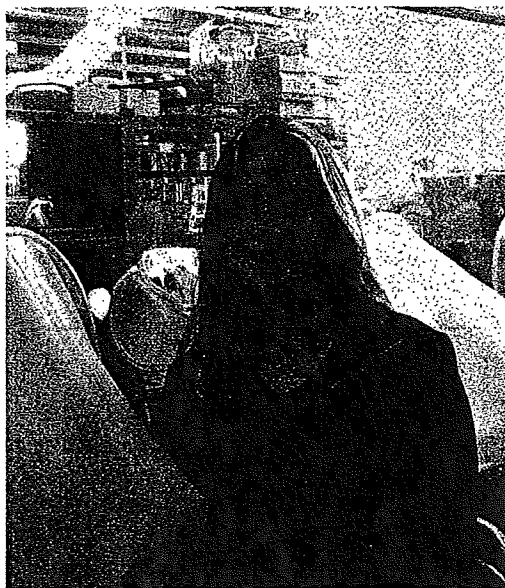


PHOTO BY CHRISTINE PHILLIPS

SUCCESS STORY Cathrine L. Drennan, assistant professor at Massachusetts Institute of Technology, is an example of a young investigator who has been able to win NIH funding. A National Academy of Sciences panel hopes to find ways to help more young investigators find similar success.

a culture where new investigators feel welcome and safe to try new things.

"The worst thing that could happen is that scientists become risk averse," Zerhouni said. To help ensure that this does not happen, NIH has already begun one pilot program to encourage risky research projects (C&EN, March 15, page 33). In addition to encouraging risk tak-

ing, this program, called the Director's Pioneer Award, shows NIH's commitment to testing new programs to improve itself, he noted.

It's this willingness to try new ideas that Zerhouni tried to instill in the panel's mind. He told the panel that he was not looking for more theoretical ideas but rather wanted the committee to develop "testable pilots" that have measurable impacts and can be evaluated.

Zerhouni also noted that the current average age of researchers independently applying for their first NIH grant is 36 or 37. However, only about a third of those applicants will receive a grant by age 39, he said.

In fact, Norka Ruiz Bravo, deputy director for extramural research at NIH, presented data showing that the average age of investigators with Ph.D.s when they receive their first major independent research grants from NIH was just shy of 42 years old in 2002, up from 39 in 1992. In addition, based on data from the American Association of Medical Colleges, she showed that the average age of first assistant faculty appointment for Ph.D. scientists has also risen, averaging 38 years in 2002.

According to Zerhouni, the increase in age of those applying for their first grant and the low success rate are not just the result of longer training periods, but also a result of social and cultural issues. For this reason, he asked the group to consider whether the traditional career path needs to be changed.

Paula E. Stephan, professor of economics at Georgia State University, provided some evidence that the traditional career path of young scientists is already changing. Based on data from the National Science Foundation survey of doctorate recipients, she shows the decrease in tenure-track positions is an important factor.

According to Stephan, the number of Ph.D.s earned in biomedical sciences has increased to 18,671 in 2001, up 59% since 1993. However, the number of young investigators in tenure-track positions during that same period rose only slightly, to 1,294 in 2001. This translates to a drop in

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probability from 10.3% to 6.9% that a young scientist trained in this field will hold a tenure-track position, she explained.

Although some would argue that the drop in the number of young scientists in

What is happening is that "the mix of faculty positions is changing," Stephan said. The profile of university hiring practices has shifted to where the number of biomedical faculty in nontenure-track posi-

tenured and nontenured positions, and available funding for nonpermanent positions have all impacted this change.

With so many factors at play, it is important to understand how NIH is currently addressing the issue. To that end, Ruiz Bravo discussed a series of grants targeting new investigators. Grants such as career (K) awards, R03, and R21 help get new scientists into the NIH system and still allow recipients to be considered new investigators for R01 grants. Based on data collected by NIH, she noted that these programs do give scientists a slight advantage when applying for funding.

But not all grants set up to target early-career scientists have worked. One program that was not effective was the R29 grant. This grant was too small and was considered in many departments as a second-class grant, explained Alan I. Leshner, chief executive officer of the American Association for the Advancement of Science. Leshner, a former NIH institute head, served on the committee that decided the fate of the R29 program.

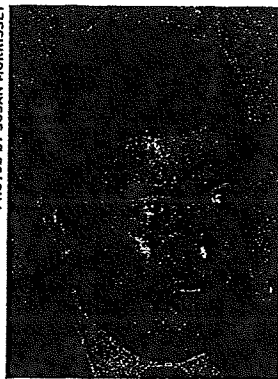
In the late 1990s, the decision was made to abolish this program in favor of adding a box on the R01 form for applicants to self-select as new investigators, Leshner explained. He cautioned the panel to keep this experience in mind when developing any new programs.

ONE SOLUTION proposed by Cech at the workshop was the creation of a new grant targeted at new investigators. This "new R01" grant, as he called it, would allow young scientists to replace the preliminary results section with previous experience. These applications would be reviewed separately from other R01 grants and would still be evaluated on scientific quality and potential impact.

The key is for these new grants to be credited by tenure committees in the same way R01 grants are credited, Cech explained. He also pointed out that they should be of the same duration and funding level of R01s and not bar the applicant from seeking additional regular R01s. Finally, he recommended that this new grant have its own "pot of money to avoid competition between new and established investigators."

However, NIH's Ruiz Bravo cautioned that only 25% of the NIH budget is allocated to fund competitive grants. From this funding, both new and experienced investigators are funded. "The NIH pie is only so big. If you want new forks in the pie, you either need to remove some old forks or make smaller slices," she noted. ■

PHOTOS BY SUSAN MORRISSEY



Zerhouni



Stephan



Ruiz Bravo

tenure-track positions is due to the long duration of postdocs, Stephan's analysis indicates that this is not a major problem. In general, she showed that the length of postdoctoral stints had been decreasing, but noted that further data was needed to completely rule out this issue as a factor.

tions—which includes positions such as staff scientists or senior postdocs—grew from 26% in 1993 to 33% in 2001, she noted.

The reason for this shift is simple—economics. According to Stephan, budget crunches, salary differences between the