 U.S. Department of Health and Human Services, National Institutes of Health From the Desk of the NIH Director, Elias A. Zerhouni, M.D., Fall 2006

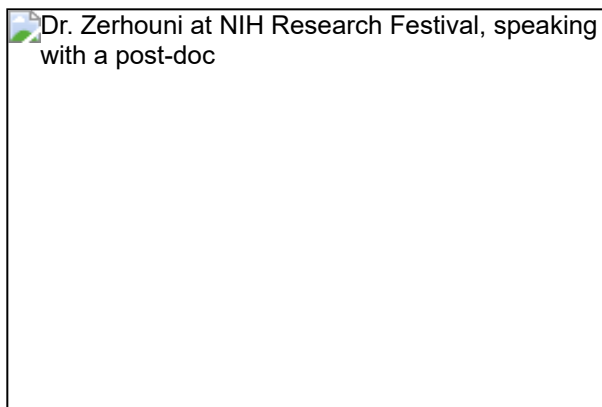
Thank you for your responses to the first two desk-to-desks. Traditionally, every autumn, the nation turns to thinking about learning. I want to share some thoughts and concerns I have about how we are preparing our emerging scientists.

Making it Work for Our Emerging Scientists

When I spoke to the Senate and House appropriations committees earlier this year, I testified that “In times of constrained budgets, the most important action NIH needs to take is to preserve the ability of young scientists with fresh ideas to enter the competitive world of NIH funding,” and I meant that most passionately. We need to do more and do it quickly in order to preserve the continuity of discovery the nation has come to rely upon to improve human health. For some, the system is working well. The best and brightest are reaching their full potential in solid, research careers. We have the evidence in the number of competitive grant applications being submitted. For others, the queue is backing up. For them, it is taking longer to complete the Ph.D. The years under post-docs as these individuals seek permanent positions have stretched. We do not want them to become discouraged. We need new investigator programs aimed at helping people move from training to independent research careers that match the needs of today’s science.

NIH and the Next Generation: Some Concerns

We are concerned about the rising age of those receiving their first R01. Between 1980 and 2004 the average age of Ph.D. scientists earning their first R01 award went from 37 to 42 years. However, the time between securing a faculty position and gaining an R01 award has stayed fairly constant over the past 25 years. The problem appears to be largely the result of the ever-increasing age at which a researcher receives his or her appointment as an assistant professor. For Ph.D. scientists, it has risen from 34 in 1980 to 38.5 in 2004. Although it is partly a reflection of the complex scientific environments that researchers grapple with, the additional time it takes to train a scientist is one key issue that must be addressed by NIH and the institutions and principal investigators charged with training the biomedical research workforce.



Dr. Zerhouni at NIH Research Festival, speaking with a post-doc

NIH is Taking Action

As we have learned from behavioral research, acknowledging a problem is an important first step in developing remedies. After much discussion and data-gathering, we have launched several new efforts, both NIH-wide and within specific ICs. We rethought our approach to attracting, training, and launching new scientists, armed for success, into productive careers.

NIH Pathway to Independence Awards. We have introduced a new model, one that bridges what we have seen as a most vulnerable time in the career path. This January, NIH launched the new “Pathway to Independence Award Program” (http://grants1.nih.gov/grants/new_investigators/index.htm). NIH will issue between 150 and 200 awards for this program in its initial year, beginning this fall. We expect to issue the same number of awards each of the following five years. The Pathway to Independence award features an initial 1-2 year mentored phase which allows investigators to complete their supervised research work, publish results, and search for an independent research position. The second, independent phase, in years 3-5, provides awardees who secure an assistant professorship, or equivalent position, significant research support including full indirect costs that will allow them to establish their own research program and successfully apply for an NIH Investigator-Initiated (R01) grant. During the full five-year period, the NIH will provide almost \$400 million in support of the program.

This is a team effort. All NIH Institutes and Centers are participating in this award program. The Pathway to Independence is a new bridge that will support new investigators at precisely the point between mentoring and independence where so many have fallen to the wayside. The Pathway to Independence Awards are a major piece of a larger, ongoing NIH effort to support new scientists as they transition to research independence, and supplements efforts being made at individual Institutes and Centers.

Additional IC-Specific Efforts. In addition, we have asked each IC to develop proactive steps, specific to their own field, to sustain promising new scientists.

For example, the **National Heart, Lung, and Blood Institute** maintains a separate, higher R01 payline for new investigators, as well as funding new investigators for all years requested. In addition, applications from new investigators that are between 5 to 10 percentile points above the regular R01 payline may undergo an expedited administrative review. **NIHES** has begun a pilot project to test the idea of a new-investigators R01 program with grants based on experience rather than data (<http://grants.nih.gov/grants/guide/rfa-files/RFA-ES-06-007.html>). This pilot includes additional financial support above normal R01 levels for equipment, resource development and career enhancement activities, and recommends the establishment of an advisory committee to provide comprehensive faculty development for the new investigator. Today, the relative likelihood of funding has improved for new investigators vs. established investigators.

The Center for Scientific Review Pilot. Time is the enemy for investigators trying desperately to obtain their first R01 before exhausting their start-up package, and currently all applicants who need to revise must sit out a review cycle to amend their applications. Therefore, NIH has piloted a new peer-review work flow system that allows new investigators to receive their critique promptly and allows them to re-apply within five months instead of the typical nine months. The Center for Scientific Review Pilot will allow new investigators to revise a grant application that missed the funding cut-off and to submit that revision for the next review cycle. The findings from this pilot will become available during fiscal year 2007. If successful, we will be looking at extending the program.

All of these pilots will undergo a rigorous evaluation to determine if they meet the needs of the community, providing support for new investigators and accelerating their successful move to research independence.

Peer Review and Award. Currently, we encourage new investigators to self-identify by checking a box on the face page of their applications. New investigators so identified are given special consideration at peer review and at the time of funding. Peer reviewers are instructed to focus more on the proposed approach than on the track record and to expect less preliminary information than would be provided by an established investigator. At the time of award, NIH Institutes and Centers give new investigators special consideration when selecting applications for funding and some IC provide longer periods of support.

Women in Science. On September 18 the National Academies of Science issued an important report, *Beyond Bias and Barriers: Fulfilling the Dream of Women in Academic Science and Engineering*. The report may be found at: <http://www.nationalacademies.org/morenews/20060918.html>. It is clear that we must take action. We have increased the pool of talented women who choose to study science and engineering — we must now focus our efforts on retaining and advancing them. As we look to the future of science, we need to ensure we fulfill the promise of 21st century science to improve the health and lives of all people, and to remain competitive in the face of increasing global science and engineering competition. This will require commitment at every level of the scientific enterprise and commitment by every individual to change the current culture. We cannot afford to lose women from the scientific and engineering workforce since they are such a significant scientific resource. NIH is studying the recommendations from the report to find the best ways to be responsive to the needs that have been identified in this ORWH-requested study.

An Office of Intramural Research task force at NIH is developing a summary report, based on surveys sent to scientists who have worked or who are working in NIH's intramural labs, to determine, in part, what within the system has or has not worked for or has worked differently for women in our labs. We are developing concrete strategies to address the "hurdle" issues that we will share with the community.

Pioneer Awards Give New Opportunities

I introduced the Pioneer Awards three years ago. In September we announced 13 new awardees, who will each receive \$2.5 million in direct costs over 5 years. They join the 22 previously awarded innovators. This is a diverse group of forward-thinking investigators whose work could break new ground in many areas of medical research. These awards give them the intellectual freedom to pursue exciting new research directions and opportunities in a range of scientific fields, including computational biology, immunology, stem cell biology, nanotechnology, and drug development. And reflecting the nature of some of today's most cutting-edge research, a number of the projects have a strong interdisciplinary thread. We are freeing proven scientists to follow their instincts to do some high-risk research and start funding a different kind of science. We are also breaking out of our own standard operating procedure with an important experiment that could inform best future practices in promoting bold science.

Readiness for the Future

When Lewis Thomas was popularizing science a few decades ago, he once wrote, "I cannot guess at the things we will need to know from science to get through the time ahead, but I am willing to make one prediction about the methods; we will not be able to call the shots in advance. . . It does not work that way."¹ We may not be able to call **all** the shots in advance, but if we do two things — hold to core principles that

have worked over a long time and expect the unpredictable — we will be the best stewards of the nation's trust.

We must protect our core mission and values, discovery and generation of new knowledge to improve human health by understanding the needs of today's scientist. We need to continue to communicate proactively and to focus on balancing the supply and demand for grants by making needed and thoughtful adjustments, and we need to continue to promote the NIH's vision for the future which is medicine that is increasingly predictive, personalized, pre-emptive and participatory. With those basic tenets in place, we can expect the special serendipities, the twists and turns and surprises of discovery while commanding the stability of the ship. We need good scientists in stable positions, with the creativity, intellect, and resources to assess and fill the nation's needs.

We need to be focused upon the time ahead. We need to find new ways to challenge the old pipeline to encourage, support, nurture and release a new generation of scientists ready for the surprising discoveries of the future, because in times of constraints the greatest risk is to stop taking risks!

Keep letting me know about your thoughts on any of these newsletters and note our Research Results for the Public is growing rapidly each month:


<http://www.nih.gov/about/researchresultsforthepublic/index.htm>.

I invite you to share any comments you have with me, directly, at zerhounidirect@nih.gov.

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National Institutes of Health

For information about NIH programs, useful health information, and additional resources, see the NIH web site at www.nih.gov. An archive of the Director's Newsletter is available at <http://www.nih.gov/about/director/newsletter/archive.htm>.

1. Lewis Thomas. *Late Night Thoughts on Listening to Mahler's Ninth Symphony*. New York: Penguin Books, 1995.

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