

SENATE COMMITTEE ON HEALTH, EDUCATION, LABOR AND PENSIONS
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TESTIMONY OF DREW GILPIN FAUST
WHY CONSECUTIVE YEARS OF FLAT FUNDING OF THE NIH
IS PUTTING A GENERATION OF SCIENCE AT RISK

Thank you Chairman Kennedy, Ranking Member Enzi and members of the Committee for this opportunity to come before you to illustrate some troubling findings about how stagnant federal funding of the National Institutes of Health is affecting both the pace and direction of medical research.

For decades, universities and the federal government, in partnership with states and philanthropists, have built and sustained a brilliant, powerful and vibrant research and educational enterprise that has moved the world: improving health, growing economies – indeed growing whole industries - and seeking always the next frontier. The underlying theory of this partnership resonates as clearly today as at its inception: Investment in basic research at our universities delivers the research “goods” today and simultaneously trains the next generation of scientists, engineers and seekers of cures. To borrow a term from biology, this “pluripotent” system regenerates our research capacity, seamlessly assuring tomorrow’s leaders will be ready to fill the shoes of the giants of yesterday and today.

This fierce force of innovation is also a fragile chain. A link in the chain is wearing thin and I am compelled to be here today because of what I am hearing from post-doctoral fellows and students considering a career in basic research. They see a future defined by new limits – not in ideas, energy, intelligence or enthusiasm—but in opportunity.

Today, a consortium of seven institutions is releasing a new report, “*A Broken Pipeline? Flat Funding of the NIH Puts a Generation of Science at Risk.*” This report follows a related report issued last March, “*Within our Grasp—or Slipping Away? Assuring a New Era of Scientific Medical Progress.*” Attached to my testimony is a full list of the 14 institutions and the 32 researchers who contributed to the findings of these two reports as well as the leading associations that have supported this work.

First, Senator Kennedy and members of the Committee, I want to thank you for your thoughtful leadership in all areas related to higher education, but specifically today for your consistent and persistent support for the National Institutes of Health and the biomedical research enterprise in the United States. Your dedication over decades has helped build a system that is the envy of the world – a system that countries around the world are working hard to replicate.

As you know, the bi-partisan doubling of the budget of the NIH between 1998 and 2003 was a transformative force for biomedical research. This support enabled the research community to harness powerful new tools and complete the Human Genome Project, placing the United States—and the world—at the crossroads of a biological science revolution. The critical infusion of funds fertilized whole new promising fields like genomics and proteomics. It unleashed our researchers to analyze biological phenomena beyond our reach only a decade ago. It has resulted in new therapies that are improving patient outcomes, produced a host of medications that are currently in clinical trials, and transformed the scientific foundation upon which today’s researchers are building new approaches to vexing public health problems. When the public

laments the inability of Congress to collaborate on great issues of our day, one need only point to the commitment for supporting NIH as a resounding example of bipartisan cooperation.

However, as the Committee is well aware, funding since 2003 has been virtually flat and erosion through inflation has been taking a significant toll. In 2006, your committee completed a comprehensive review of NIH when you crafted the reauthorization. One of your important recommendations was a call for funding increases at NIH for 2008 and 2009 of 7 and 8 percent respectively. Sadly, those numbers, which the reauthorization was built around, have not been realized and flat or below inflation increases have persisted.

Two years ago, concerned that protracted flat funding in biomedical research at NIH was damaging our ability as a nation to capture the true promise of the doubling, a group of concerned institutions set out to closely examine what was happening on campuses and in medical centers as a result of this downturn in the funding trajectory. These results were captured in the two reports being discussed today.

What we have found is that the 13-percent loss in real dollars over the last five years is having a cascading impact that is slowing progress and threatening future research that could lead to cures and even ways to prevent disease.

Leading scientists with quality grant proposals are caught in a protracted grant review process that plays out often over years, not months. As a result, investigators are downsizing labs, slowing research and producing more conservative, less ambitious proposals that are more likely to secure funding.

Junior faculty who witness the struggles of their advisors are asking themselves how they can possibly compete with their mentors for a piece of the reduced research pie. At the same time, they are mentoring their own students and working to encourage the next generation of scientists who could and should be tomorrow's pioneers. The result too often is a ladder of discouragement that we hope our country recognizes and begins to address today.

Says Anil Potti, a young physician researcher from Duke University who is using genomic strategies to improve the outlook and treatment of patients with lung cancer: *"I worry most about what this means for patient care. It takes a long time not only to get approved...but also to get the funding once you are approved. The whole cycle can take 12-18 months, and that's if you're successful on the first or second try. In the meantime, I'm seeing patients every day who could benefit from this research."*

When we produced the first publication in 2007, every one of the 20 senior researchers interviewed expressed optimism at the scientific possibilities created by the powerful federal investment Congress made in NIH at the turn of the century. They enthusiastically described their ongoing work and their plans to prevent the ravages of Alzheimer's, attack cancer, stop the twin epidemics of obesity and diabetes, repair spinal cord injuries or fight emerging infectious diseases. But their elation has been dampened by years of tightened budgets, which they say is eroding their ability to harness and advance those potential breakthroughs.

Perhaps the most alarming and consistent message we heard was the growing sense among senior researchers that those most affected by the budget crisis are the emerging young investigators. Their careers are being stifled. We were told repeatedly that brilliant young researchers, whose training coincided in some degree to the excitement of the doubling, are stuck behind their

mentors in a funding queue that is stalling promising careers in academic research and pushing many with substantial promise to seek alternative paths.

Fearful that our nation's dampened commitment to biomedical research was hindering scientists' ability to speed therapies to the bedside, our attention was collectively drawn to an even more damaging longer term impact—the loss and discouragement of a generation of researchers.

So, we sought this year to find out more. We interviewed twelve brilliant junior faculty at seven institutions across the country, who work in several different fields. The findings are more uniform and obvious than any experiment any of them are likely to do in their careers. While they each remain powerfully drawn to the promise of alleviating pain and suffering, they are confronted with a reality that diminishes many of their hopes and dreams.

Michael Rodriguez, a physician-researcher at UCLA, says *“Twenty-four hours a day, seven days a week, you're thinking about your grant proposals and wondering how to survive in this world where fewer people are getting funded, and proposals that are funded aren't being fully funded or are being cut.”*

Anne Giersch, an assistant professor at Harvard told the interviewers *“I don't think one researcher's funding plight means anything much in the scheme of things, but I think my difficult experience is being played out many times over. I hate to think of all the lost opportunities for scientific progress that are going unfunded, and the loss of economic competitiveness that will accrue if these funding trends continue.”*

These researchers were trained at some of the best institutions in the world, mentored by leaders in their scientific fields, have been recognized for their early work, and hold tremendous promise for the future of science. If these scholars are struggling, it is clear that as a nation we most certainly have a problem.

Consider a few facts:

- The average age of a first-time recipient of an RO1 grant – the premier NIH research grant one needs to establish credibility - is 43 years old, up from 39 in 1990.
- The success rate of an RO1 grant application when first submitted is only 12% today, a severe drop from the 29% it was in 1999.
- For even top senior scientists success may mean two or three submissions of a grant application over an 18-month to 2-year period resulting in a grant whose size has been substantially cut from 5 years ago.
- The response to rejected grants are downsized labs, lay-offs of post docs, slipping morale, and more conservative science that shies away from the big research questions.
- After multiple submissions and a protracted process, only about 20% of grants will ultimately be funded.
- The percent of RO1's that will go to first-time investigators was 25% in 2007, down from 29% in 1990.

Nancy Andrews, Dean of Duke University Medical School, puts it this way: *“What a strange business this is: We stay in school forever. We have to battle the system with only a one in eight or one in ten chance of getting funded. We give up making a living until our forties. And we do it because we want to help the world. What kind of crazy person would go for that?”*

And there is a related issue we all need to be concerned about. Through our long-term commitment to funding medical research, the United States has built a system of scientific innovation that simultaneously trains our own best and most talented people and attracts the best and brightest from around the world. We have ‘in-sourced’ talent, combined it with our own and pushed the boundaries of innovation for our economy and, indeed, the world.

But today, China, India, Singapore and others have adopted biomedical research and the building of biotechnology clusters as national goals. Suddenly, those who train in America have significant options elsewhere.

Mr. Chairman and members of the Committee, we are well aware that the scientific justification for financial support will always outstrip our ability to fully invest, and that your difficult job is to strike the appropriate balance. It is also a fact that NIH will spend \$30 billion this year in labs across this country that will continue to produce startling new results – for which we thank you sincerely.

But we cannot afford to simply tread water. Last March, Dr. Joan S. Brugge, Chair of the Department of Cell Biology at Harvard Medical School, testified before the Senate Committee on Appropriations where she discussed the impact of the aging baby boomer generation and warned, *“We cannot afford to stand still—the demographics are against us. There is an impending increase in cancer due to the baby boomers aging into their cancer-prone years, which has been referred to as an impending tsunami. You are all keenly aware of the ramifications for government of Medicare entitlements associated with this surge in cancer. But unlike a real tsunami, which comes unexpectedly with no time for preparation, we are well aware of this impending crisis. And we know that the Congressional investment in basic and cancer-focused research has positioned the cancer research community to make more rapid progress in translating basic discoveries into diagnosis, treatment, and eventually, prevention of cancer.”*

Past investment has positioned us to make key advances on the broad range of disease and we cannot afford to retreat.

However, the New England Journal of Medicine recently featured a commentary proclaiming that *“the nation’s biomedical research enterprise has never experienced a recession of this magnitude or duration.”*

Last year, we reported that our ability to harvest the fruits of previous scientific investments is truly slipping away.

Today we present new evidence in a report with a more troubling message, delivered by 12 of the nation’s most promising junior researchers. They are telling us that the current system is discouraging them and their peers from entering or remaining in academic biomedical research. We may be creating a climate where our position as the primary destination for the best and brightest researchers from around the world may be challenged.

The messages in both of these reports should be a wake up call to all of us. We agree with Dr. Elias Zerhouni, Director of NIH, when he says:

“Without effective national policies to recruit young scientists to the field, and support their research over the long term, in 10 to 15 years, we’ll have more scientists older than 65 than those younger than 35. This is not a sustainable trend in biomedical research and must be addressed aggressively.”

Thank you Chairman Kennedy and Senator Enzi for this opportunity to provide this testimony on behalf of the consortium of concerned institutions that sponsored these reports. I look forward to your questions.

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