

Flat NIH Funding Threatens Scientific Progress

Representatives from 9 of the nation's preeminent scientific and medical institutions told the U.S. Congress on March 19 that years of stagnant budgets outpaced by inflation threaten the progress of biomedical research and could thwart advances in treatments that are within reach. In a new report on the status of U.S. medical research and its funding, the group explained how perennially flat funding for the National Institutes of Health (NIH) has halted promising research in midstream, challenged seasoned researchers to continue to achieve significant results, and threatened the future of young investigators pursuing careers in academic research. If left unaddressed, the group cautioned, these problems could undermine U.S. global leadership in biomedical research.

"When scientists have to spend most of their time trying to get funded, caution wins out over cutting-edge ideas, creativity sacrifices to convention, and scientific progress gives way to meetings and grant applications," said report contributor and infectious disease expert Robert Siliciano, MD, PhD, from the Johns Hopkins University School of Medicine (JHU). "Right now, very, very productive scientists are doing too little research. Instead, they are spending their time trying to get their labs funded again."

The report, "Within Our Grasp—Or Slipping Away? Assuring a New Era of Scientific and Medical Progress," was coauthored by scientists and physicians at the University of California, Columbia University, Harvard University, JHU, Partners HealthCare, the University of Texas at Austin, Washington University, the University of Wisconsin—Madison, and Yale University.

The group maintains that to fulfill the promise of previous investments by Congress more consistent and robust funding must be provided for NIH. Although the doubling of the NIH budget between 1998 and 2003 enabled advances in basic research that transformed understanding of diseases affecting millions of Americans, the budget has been virtually frozen since 2003. When inflation is figured in, the budget has actually shrunk by as much as 13%. A recent small increase approved by Congress in the 2007 budget would be virtually wiped out by the Bush administration's proposed 2008 budget, continuing the downward spiral in inflation-adjusted dollars. The implications are far reaching for science, medicine, the economy, and U.S. leadership in biomedical science, the report suggests.

According to specific achievements cited in the report, the country reaped a strong pay-off from previous years of robust funding of basic biomedical research. However, the authors warn, "The American public will ultimately pay the price for slowing the pace of research as scientists downsize their laboratories and abandon some of their most

innovative work." The report argues that research momentum gains have slowed and, in some cases, may be lost if flat funding continues. For example, "The number of drugs moving into the pipeline that are based on our new, more profound genetic and molecular understanding of cancer is extraordinary—and there's no money to handle the testing of these compounds," said Joan Brugge, PhD, who chairs the Department of Cell Biology at Harvard Medical School.

A similar situation faces spinal cord and brain injury research: "Ten years ago, the search for treatment of spinal cord injury was a daunting and hopeless task," said Stephen Strittmatter, MD, PhD, a professor of neurology and neurobiology at that Yale University School of Medicine. "Today, the neurological sciences are on the launching pad of a revolution. We are at a juncture where we can begin identifying multiple molecular targets for the neurological diseases that have stymied us for so long. Without funding, they may go undiscovered, and we will have only weakly effective therapies."

Only 2 of 10 research grant applications are being funded, according to the report. Even these often require multiple submissions and may then suffer from lapses in planned continuations of funding. Certain NIH institutes, such as the National Cancer Institute, report that they can fund only 11% of research project grant applications, rejecting many of exceptional quality. The effects are being felt by both principal investigators and young researchers new to the field. For young researchers, the decreased funding contributes to another problem: a multiyear wait before receiving first grants. In 1970, the average age of recipients of first grants was 34.2 years; today it is 41.7.

"Our product is not just our technology or medical breakthroughs," said Brent Iverson, PhD, from the University of Texas at Austin. "Our College of Natural Sciences alone puts 1,000 undergrads in research situations in labs, most with NIH funding. That is a catalyst for creating innovative new scientists." Many senior scientists fear that young people will turn away from science because the funding situation is so bleak. Scientists report that many of the brightest young minds no longer see the promise of a career in science, choosing law, business, and other professions. Losing young scientists today will cost the United States, the report warns. "That will have a generational impact that will take 15 years to fix," said Richard Davidson, PhD, University of Wisconsin—Madison.

The report also warns that a substantial number of scientists are forced to abandon innovative and promising research in favor of more conventional projects with more predictable (and fundable) results. Principal investigators

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- Jared Martarano, University of Buffalo, State University of New York;
- Andrea Mason, University of Arkansas for Medical Sciences, College of Health Related Professions;
- Lisa Meyer, University of Iowa Hospitals and Clinics (Iowa City);
- Jaykumar Patel, University of Medicine and Dentistry of New Jersey School of Health Related Professions (Scotch Plains);
- Sarah Pyatt, Indiana University;
- Tracy Rebscher, University of Medicine and Dentistry of New Jersey School of Health Related Professions;
- Danielle Rill, The Johns Hopkins School of Medical Imaging (Baltimore, MD);
- Jessica Sharp, University of Nebraska Medical Center (Omaha); and
- Brooke Whitcher, Mayo School of Health Sciences.

Associate Degree Program

- Andrea Cyphers, Delaware Technical and Community College (Stanton);
- Morgan Creason, Jefferson Community College (Louisville, KY);
- Lindsay Ferguson, The University of Findlay (OH);
- Erin Obsniuk, British Columbia Institute of Technology (Burnaby, Canada);
- Connie Roberts, Gateway Community College (Phoenix, AZ);
- Derrick Turner, University of Cincinnati (OH); and
- John Williams, Triton College (River Grove, IL), funded by SNM Central Chapter.

Certificate Program

- Bryce Bakkedahl, Mayo School of Health Sciences;
- Kathy Carpenter, College of Dupage (Glen Ellyn, IL);



Students from the Mayo School of Health Sciences celebrated their scholarships. From left: Brooke Whitcher, Ashley Munson, Bryce Bakkedahl, and Dennis Flood.

- Nino Gotsiridze, Institute of Allied Medical Professions, Mount Sinai School of Medicine (New York, NY);
- Jason Hendershot, Johns Hopkins School of Medical Imaging;
- Ashley Munson, Mayo School of Health Sciences;
- Sheela Shivraman, William Beaumont Nuclear Medicine Program (Royal Oak, MI);
- Melissa Stump, Research Medical Center (Kansas City, MO); and
- Beth Tichelar, College of Dupage.

According to Bates, the quality of the applications received this year was outstanding and the numbers of applicants for each award program either equaled or exceeded those in previous years.

For more information about these awards or to learn more about the ERF or PDEF, contact Renee Bergen, SNM Grants and Awards program manager, at 703-708-9000 ext. 1255 or rbergen@snm.org. Information on SNM and SNMITS grants and awards is also posted at www.snm.org/grants. ✨

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also must spend significant portions of their time fundraising and writing grants rather than conducting research. Others are following research dollars to European and Asian countries that are investing in biomedical sciences as high national priorities and actively recruiting accomplished U.S. scientists. Nobel Laureate Eric Kandel, PhD, from Columbia University Medical Center, who contributed to the report, noted: "The scientific community is one of the driving forces of the economy. In biology, it helps drive the pharmaceutical industry and helps people live longer in a productive way. Now, the rug has been pulled from under science in this country. We'll lose scientific manpower to

European countries, and to India, China and Japan." The funding problem is so urgent that the NIH 2007 "Fiscal Policy for Grant Awards," urges decisionmakers to consider "the goal of not losing outstanding laboratories" as they allocate limited funds.

The new report concludes that addressing the funding crisis now is imperative, given the demographics of the population. "Medical treatments take decades to develop," said Brugge. "If we wait until the baby boomers retire to find the most effective means for prevention and treatment for diseases like Alzheimer's and cancer, we will break the bank." A complete copy of the report is available at: http://hms.harvard.edu/public/news/nih_funding.pdf. ✨