

BIOMEDICAL RESEARCH FUNDING

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Introduction

A half century of sustained investment by the United States Federal Government in biomedical research has dramatically advanced the health and improved the lives of the American people. The National Institutes of Health (NIH) specifically has had a significant impact on the United State's global preeminence in research and fostered the development of a biomedical research enterprise that is unrivaled throughout the world. As the world's largest supporter of biomedical research, the NIH competitively awards extramural grants and supports in-house research. However, with the continued decline in real dollars allocated to biomedical research each year by the federal government, the opportunities to discover life-changing cures and treatments will drastically decrease.

Background

Federally funded biomedical research is supported through funding to NIH, National Science Foundation, United States Department of Agriculture, Department of Energy, National Aeronautics and Space Administration, Centers for Disease Control and Prevention, and Department of Veterans Affairs. However, the NIH is the leading and sometimes only source of funds for certain types of vitally important clinical and translational research that is not performed in the private sector or other government agencies. Formed in 1887, the NIH comprises 27 institutes and centers and annually invests more than \$28 billion in medical research. More than 83% of the NIH's funding is awarded through almost 50,000 competitive grants to more than 325,000 researchers at over 3,000 universities, medical schools, and other research institutions around the United States and throughout the world. About 10% of the NIH's budget supports projects conducted by scientists in its own laboratories.¹

During the past decade, Congress has shown its support for biomedical research by consistently increasing the budgets of the agencies that support such research. From 1998 to 2003, a commitment was made to double the budget of the NIH from \$13.6 billion to \$27.3 billion, allowing the agency to fund a number of important clinical trials for chronic conditions, develop tests for earlier cancer detection, and conduct the Diabetes Prevention Program.²

¹ National Institutes of Health website at www.nih.gov.

² National Institutes of Health "Doubling Accomplishments" fact sheet.

Considerations

Since the doubling of its budget, the NIH has received annual funding increases below the rate of biomedical inflation. FY 2009 appropriations resulted in the first real-dollar increase in NIH funding since FY 2003. This decline in useable dollars has resulted in a significant decrease in the number of R01 grants funded. In 2003, the number of new and continuing R01s was 7,211; the number of grants awarded in 2008 dropped to 5,886. As a result of the decreasing number of grants awarded, the success rate for new R01 grants dropped from 25.5 percent in 1999 to a low of 16.3 percent in 2006 (the 2008 success rate was 19 percent). Not only does the decline in grants affect the number of scientists who are able to continue their research and discover new treatments and cures, it also has a significant impact on the United States economy. In order to fully understand the importance of maintaining the growth experienced during the doubling period, policymakers must first understand the positive impact that research programs have on the population of the country.

Increased longevity and improved quality of life

Research funded by federal dollars has resulted in significant advances in the prevention and treatment of some of the nation's most prevalent diseases, at a fraction of the cost of simply managing these conditions. For instance, the Study of Osteoporotic Fractures found that for women, one of the best predictors of fracture is bone mineral density of the hip, resulting in a better method for identifying those at risk for osteoporosis and preventing costly and debilitating fractures that cost \$18 billion annually in direct care. Studies conducted by the NIH have found that with intensive lifestyle intervention, a patient's risk of getting type 2 diabetes can be reduced by 58 %, and that the drug metformin can reduce the development of diabetes by 31%.³ However, if funding levels for biomedical research do not keep pace with inflation, many of the breakthroughs in medical care that are on the horizon will not be realized.

Impact on the national, regional, and local economy

Biomedical research funds allocated by the federal government support both basic and translational research, ensuring that the discoveries made in the laboratory become realistic treatment options for patients suffering from debilitating and life-threatening diseases. In addition to improving quality and length of life, these advances in treatment also reduce the health care costs of our nation. With

³ National Institutes of Health "Doubling Accomplishments" fact sheet.

the aging of the Baby Boomer generation, the incidence of costly, chronic conditions will significantly increase, and a large portion of the projected increase in health care costs will be as a result of escalating costs associated with diabetes, Alzheimer's disease, muscular dystrophy, cystic fibrosis, and stroke. In order to prevent and treat these diseases, and save the country billions in healthcare costs, significant investment in biomedical research will be needed. For instance, treatments that delay or prevent diabetic retinopathy save the country \$1.6 billion a year, and new treatments that delay the onset and progression of Alzheimer's disease by five years can save \$50 billion a year in health care costs.⁴

In addition to the impact that research has on spending on health care for the nation's population, research funding also has a significant impact on local economies by funding new jobs. For instance, for every \$1 million received in grant funding in Colorado, 38 jobs are funded. Biotechnology accounts for 98 of every 1,000 jobs in Colorado. And for every dollar invested in the University of Alabama, \$11 is returned to the community, resulting in \$2.5 billion injected into the community in 2001.⁵ Without federal research funding, the revenue injected into local and regional economies would be lost, significantly impacting not only those individuals directly involved in research, but also affecting industries that depend on the downstream revenue.

Continued dominance in science and the global economy

As the amount of real dollars allocated to federal research funding declines, so too do the opportunities for researchers. As a result, scientists are often forced to find other careers or move to other countries to continue their research, depleting the pool of talent that government agencies and pharmaceutical companies have to draw from. Without these scientists in our workforce, many medical breakthroughs will either never happen or will happen as a result of overseas research.

A recent *Research!America* poll found that 76% of Americans feel that it is very important to maintain our position as a global leader in scientific research, and 76% believe that it is very important to create more career opportunities in science and research.⁶ The "America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science Act" (COMPETES), passed in August 2007, provides an example of a federal funding program that supports the career development of those interested in research. This law keeps research programs at NSF and DOE on a near-term doubling path, expands programs at NSF to enhance the undergraduate education of the future science and engineering workforce, and expands early career grant programs for outstanding young researchers at NSF and DOE. However, this may have only a limited impact on the current supply of researchers; policymakers must continue to ensure

that funding is available to create opportunities for new *and* existing researchers.

Positions

Members of Congress and President Obama recognized the positive impact that funding NIH research can have on the economy and allocated over \$10 billion to the NIH in the American Recovery and Reinvestment Act of 2009 (ARRA). These funds supported more than 12,000 grants and created more than 50,000 jobs. ARRA funds have allowed the NIH to award grants which will lead to breakthroughs in hundreds of disease areas, including those chronic diseases that result in the death of so many people each year.

Unfortunately, the grants and jobs created will disappear at the end of FY 2010 if Congress does not sustain the momentum created by the ARRA funds with a significant increase in the FY 2011 budget. While it is not feasible to expect that the NIH budget can be increased in one year to a level that will sustain the 12,000 grants awarded through the ARRA funds, Congress must do what it can to ensure that NIH receives steady, sustainable, predictable increases that avoid the boom and bust cycle that NIH experienced with the doubling of its budget, and now faces again with the end of the ARRA funds. The loss of these jobs could have a drastic effect on our economy and counteract the benefits realized during FY 2009 and 2010 as a result of the stimulus funding.

The Endocrine Society remains deeply concerned about the future of biomedical research in the United States without sustained support from the federal government. The Society strongly supports the continued increase in federal funding for biomedical research in order to prepare for the post-stimulus era and ensure the steady, sustainable growth necessary to complete the President's vision of doubling the investment in basic and clinical research. As such:

- The federal government should continue to increase funding levels for NIH, DOE, NSF, and VA annually by sums necessary to keep pace with inflation and maintain the growth experienced during the NIH doubling period.
- For FY 2011, The Endocrine Society recommends that the agencies that support biomedical research receive the following appropriations in order to recoup the losses caused by biomedical inflation, fund necessary new research programs, and build on the discoveries made during the doubling period:
 - National Institutes of Health - \$37 billion
 - National Science Foundation - \$7.68 billion
 - Department of Energy's Office of Science - \$5.24 billion
 - Department of Veterans Affairs - \$1 billion for VA Medical and Prosthetics Research Program

⁴ *Research!America* presentation.

⁵ *ibid.*

⁶ Bridging the Sciences Survey, *Research!America*, 2006.