

Testimony before the  
Subcommittee on Commerce, Justice, Science and Related Agencies  
House Committee on Appropriations

by

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## **Introduction**

Good afternoon, Mr. Chairman, Mr. Frelinghuysen, and members of the Subcommittee. Thank you for this opportunity to testify before you today on the fiscal year (FY) 2008 research and development (R&D) budget request.

The American Association for the Advancement of Science (AAAS) is the world's largest multidisciplinary scientific society and publisher of the journal, *Science*. AAAS was founded in 1848, and includes some 262 affiliated societies and academies of science, representing 10 million individuals.

For more than 30 years, the AAAS R&D Budget and Policy Program has strived to be a comprehensive, reliable, and impartial source of information on the federal investment in research and development. AAAS recently released its preliminary analysis of R&D in the FY 2008 budget request, and the numbers presented in this testimony reflect that analysis. A copy of the AAAS analysis is attached to my statement.

## **Overview**

I'd like to begin by thanking the committee for providing generous increases to several science agencies in the FY 2007 joint funding resolution. We know there were many difficult choices to be made, and we applaud your commitment to scientific research. Over the past year, the scientific community has been pleased to see bipartisan, bicameral support for science and the recognition of its important role in driving the future of the Nation.

AAAS believes strongly in the importance of a broad, balanced portfolio of R&D investments. The need for strong support across all scientific fields comes both from the increasing interdependence of engineering, physical, biological, behavioral, and social sciences,

and from the importance of all these fields to innovation and the growth of the economy, as well as to the improvement of the health and quality of life of all Americans.

The President's recently announced FY 2008 budget proposal would increase funding for three key physical science agencies as part of the American Competitiveness Initiative (ACI), and we are very pleased by the emphasis on investing in basic research.

However, the budget proposal would cut funding for most other research-oriented agencies in the federal government. Though the total federal investment in R&D in the FY 2008 budget request would increase 1.4 percent to \$143.0 billion, the entire increase and more would go to **development** funding, primarily for defense weapons and NASA spacecraft. This would leave the federal investment in basic and applied research, the vital feedstock for innovation in the U.S. economy, down 2.0 percent to \$55.4 billion. In inflation-adjusted terms, the basic and applied research portfolio would fall for the fourth year in a row. In fact, overall federal funding for the major science and engineering disciplines is now in decline. This is the case even in the physical sciences, where gains in the ACI agencies have been more than offset by cuts in scientific research programs at NASA and DOD.

We are concerned that while scientific research has been brought to the forefront of discussions for its contributions to the future of the Nation, overall science funding is on the decline, sending a stark warning signal to those who would consider committing their futures to a career in the sciences and leaving many important research inquiries unfunded.

## **Agency Analyses**

I'd like to highlight a few key points in the budget request for agencies under the subcommittee's jurisdiction:

*National Science Foundation (NSF):* Overall, we are very pleased with the proposed increase for NSF's research programs in FY 2008, which would bring funding for most research disciplines back up to the 2004 funding level in real terms. Although NSF accounts for less than 4 percent of total federal R&D spending, it supports more than half of non-medical academic research and therefore its contribution is extremely important. The competition for NSF funds is fierce; for example, less than 25% of proposals submitted in FY 2006 were funded. As a result, a large

number of potentially fundable proposals are declined each year. In FY 2005, close to \$1.8 billion of proposals that rated in the very good to excellent range were declined, representing a rich portfolio of lost research and education opportunities.

AAAS is encouraged that the NSF request shows some support across *all* scientific fields - not only the physical sciences - illustrating the interdependence of physical, biological, behavioral, and social sciences. A successful, innovative future will draw upon contributions and interactions from a broad spectrum of fields of inquiry, and robust support is needed for all of them.

But the news is not as good in education. Despite a proposed increase in the budget for NSF's Education and Human Resources programs in FY 2008, its funding would remain nearly 20 percent below its 2004 level in real terms due to three years of cuts. As the National Academies recognized in *Rising Above the Gathering Storm*, improving math and science education is crucial to guaranteeing the United States' future economic competitiveness. NSF's support of research on effective math and science education strategies merits greater support.

*National Aeronautics and Space Administration (NASA)*: The FY 2008 budget proposes a substantial increase in the NASA budget. However, by focusing primarily on construction of the International Space Station and development of the next generation of human space vehicles, NASA's important support of research in space science, the physical sciences, the life sciences, aeronautics, and environmental sciences would be significantly shortchanged. Over the last several years, NASA support of research has declined dramatically as the costs of returning the Space Shuttle to flight and the costs of developing the Crew Exploration Vehicle and Crew Launch Vehicle have escalated. The 2008 budget would continue that trend.

These cuts have had a particularly strong impact on vitally-important climate change research. NASA is the largest sponsor of climate change research in the federal government. Cuts in the FY 2008 budget request for NASA's earth science research programs would lead to a 25 percent decline since FY04 in federal climate change research.

*National Institute of Standards and Technology (NIST)*: We applaud the FY 2008 budget's continuing commitment to the intramural laboratory research programs at NIST, which provide crucial support for the physical sciences that underlie much of U.S. innovation. But the budget

would dramatically scale back funding for NIST's external programs. As in previous years, the budget proposes to eliminate the valuable Advanced Technology Program and reduce funding for the Hollings Manufacturing Extension Partnership. Similar elimination proposals were rejected by this committee in the FY 2007 joint funding resolution, and the programs were sustained.

*National Oceanic and Atmospheric Administration (NOAA):* While the budget would provide new money for research on key oceans issues, it appears that overall NOAA funding of oceanic and atmospheric research, including crucial research on climate change and fisheries, would decline from the funding levels contained in the FY 2007 joint funding resolution.

*Earth Observing Systems:* We are quite concerned that at a time when there is increasing recognition of the great need to understand the Earth's climate and how it is changing, the decreases in science funding for NASA and NOAA have resulted in decreased support for earth observing systems, including instruments and environmental satellites. These tools provide critical data for understanding climate, predicting natural disasters, and observing land use. A recent National Research Council report, *Earth Science and Applications from Space: National Imperatives for the Next Decade and Beyond*, cautions that the Nation's system of environmental satellites is "at risk of collapse." Without these satellites, the U.S. will be unable to collect essential data needed to "achieve prosperity, health, and sustainability."

## **Conclusion**

The ACI and congressional innovation legislation do recognize that the U.S. economy, now and in the future, will depend on our ability to innovate, and that maintaining the U.S. lead in innovation relies on a strong foundation of federal investment in research and education. We appreciate and share that recognition. However, federal research investments are shrinking as a share of the U.S. economy, just as other nations are increasing their investments. China and South Korea, for example, are boosting government research by 10 percent or more annually.

Robust research funding is necessary to gain the data needed to understand and craft solutions to pressing issues, ranging from a greater understanding of and technological options

for combating global climate change, to safely using nanotechnology, to ensuring sustainable oceans and fisheries.

In an increasingly technology-based economy that relies on federally-funded research as the seed corn for technology-based innovation, the federal government needs a sustained commitment to a robust research portfolio that recognizes the interdependence and critical role of all scientific disciplines to a future innovative society.

## APPENDIX A

### **American Association for the Advancement of Science (AAAS)**

The American Association for the Advancement of Science (AAAS) is the world's largest multidisciplinary scientific society and publisher of the journal, *Science* ([www.sciencemag.org](http://www.sciencemag.org)). AAAS (triple A-S) was founded in 1848, and includes some 262 affiliated societies and academies of science, representing 10 million individuals. *Science* has the largest paid circulation of any peer-reviewed general science journal in the world, with an estimated total readership of over one million. The non-profit AAAS ([www.aaas.org](http://www.aaas.org)) is open to all and fulfills its mission to “advance science and serve society” through initiatives in science education, science policy; international programs; and an array of activities designed both to increase public understanding and engage the public more with science.

Every year since 1976, AAAS has published an annual report analyzing research and development (R&D) in the proposed federal budget in order to make available to the scientific and engineering communities and to policymakers timely and objective information about the Administration's plans for the coming fiscal year. At the end of each congressional session, AAAS also publishes a report reviewing the impact of appropriations decisions on research and development. AAAS has also established a Web site for R&D data on which we now post regular updates on budget proposals, agency appropriations, and outyear projections for R&D, as well as numerous tables and charts. The address for the site is [www.aaas.org/spp/rd](http://www.aaas.org/spp/rd).

**ALAN I. LESHNER**

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and

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Dr. Leshner has been Chief Executive Officer of the American Association for the Advancement of Science and Executive Publisher of the journal *Science* since December 2001. AAAS was founded in 1848 and is the world's largest, multi-disciplinary scientific and engineering society.

Before coming to AAAS, Dr. Leshner was Director of the National Institute on Drug Abuse (NIDA) from 1994-2001. One of the scientific institutes of the U.S. National Institutes of Health, NIDA supports over 85% of the world's research on the health aspects of drug abuse and addiction.

Before becoming Director of NIDA, Dr. Leshner had been the Deputy Director and Acting Director of the National Institute of Mental Health. He went to NIMH from the National Science Foundation (NSF), where he held a variety of senior positions, focusing on basic research in the biological, behavioral and social sciences, science policy and science education.

Dr. Leshner went to NSF after 10 years at Bucknell University, where he was Professor of Psychology. He has also held long-term appointments at the Postgraduate Medical School in Budapest, Hungary; at the Wisconsin Regional Primate Research Center; and as a Fulbright Scholar at the Weizmann Institute of Science in Israel. Dr. Leshner is the author of a major textbook on the relationship between hormones and behavior, and has published over 150 papers for both the scientific and lay communities on the biology of behavior, science and technology policy, science education, and public engagement with science.

Dr. Leshner received an undergraduate degree in psychology from Franklin and Marshall College, and M.S. and Ph.D. degrees in physiological psychology from Rutgers University. He also holds honorary Doctor of Science degrees from Franklin and Marshall College and the Pavlov Medical University in St. Petersburg, Russia. Dr. Leshner is an elected fellow of AAAS, the National Academy of Public Administration, the American Academy of Arts and Sciences, and many other professional societies. He is a member (and on the governing Council) of the Institute of Medicine of the National Academies of Science. The U.S. President appointed Dr. Leshner to the National Science Board in 2004. He is a member of the Advisory Committee to the Director of NIH, and represents AAAS on the U.S. Commission for UNESCO.