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Federal Funding

for Biomedical and Related Life Sciences Research

FY 2018



The Federation of American Societies for Experimental Biology (FASEB) advances health and welfare by promoting progress and education in biological and biomedical sciences through service to our member societies and collaborative advocacy.

FASEB Member Societies:

The American Physiological Society
American Society for Biochemistry and Molecular Biology
American Society for Pharmacology and Experimental Therapeutics
American Society for Investigative Pathology
American Society for Nutrition
The American Association of Immunologists
American Association of Anatomists
The Protein Society
Society for Developmental Biology
American Peptide Society
The Association of Biomolecular Resource Facilities
The American Society for Bone and Mineral Research
The American Society for Clinical Investigation
Society for the Study of Reproduction
The Teratology Society
Endocrine Society
The American Society of Human Genetics
International Society for Computational Biology
American College of Sports Medicine
Biomedical Engineering Society
Genetics Society of America
American Federation for Medical Research
The Histochemical Society
Society for Pediatric Research
Society for Glycobiology
Association for Molecular Pathology
Society for Redox Biology and Medicine
Society for Experimental Biology and Medicine
American Aging Association
U. S. Human Proteome Organization



Executive Summary

Advances in biomedical and biological research have improved the health of our citizens, generated new treatments for life threatening diseases, and enhanced our quality of life. The opportunities for additional progress are enormous. The United States is the world leader in this crucial area of research, but our future success requires sustained and predictable growth in the federal investment in the nation's research enterprise. This report presents FASEB's fiscal year (FY) 2018 funding recommendations for the following federal agencies:

National Institutes of Health (NIH)

FASEB recommends at least \$35.0 billion for NIH in FY 2018

National Science Foundation (NSF)

FASEB recommends at least \$8.0 billion for NSF in FY 2018

Veterans Affairs Medical and Prosthetic Research Program (VA)

FASEB recommends at least \$713 million for the VA Medical and Prosthetic Research Program in FY 2018

United States Department of Agriculture (USDA)

FASEB recommends at least \$700 million for the USDA Agriculture and Food Research Initiative (AFRI) and \$1.24 billion for the Agricultural Research Service (ARS) in FY 2018

Department of Energy Office of Science (DOE SC)

FASEB recommends at least \$5.8 billion for the DOE SC in FY 2018

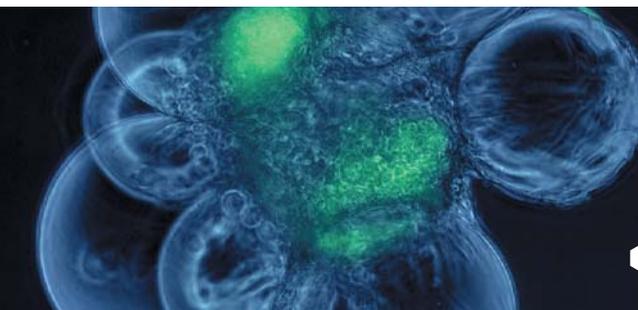
NATIONAL INSTITUTES OF HEALTH

The National Institutes of Health (NIH) is the nation's largest funder of biomedical research. It provides competitive grants to more than 300,000 scientists at universities, medical schools, independent research institutions, and biotechnology companies located in nearly every congressional district. A century of advances based on NIH-funded research has improved our health, fostered economic growth, and expanded our scientific knowledge. Increased longevity, a reduction in the number of deaths from heart disease and stroke, the development of the first vaccines for hepatitis A and Ebola, and research that led to the approval of innovative treatments for rare autoimmune diseases are part of NIH's outstanding legacy.

A base budget of \$35.0 billion in FY 2018 would allow NIH to accelerate progress in all areas of research with the potential to transform our understanding of human health and disease. This funding level could support approximately 2,000 new R01 grants for investigator-initiated research, a major step in reversing the 22 percent loss of research capacity NIH experienced from FY 2003 to 2015 due to budget cuts, sequestration, and the failure to keep pace with rising costs. These funds could also enable NIH to accelerate clinical trials for new therapies and take advantage of improvements in technology to further develop novel research methods and techniques. The \$500 million already authorized through the 21st Century Cures Act would provide additional support in FY 2018 for research in four areas: cancer, precision medicine, neuroscience, and regenerative medicine. But there are other areas in urgent need of additional resources.

The funding level of \$35.0 billion reflects the growth recommended in the bipartisan FY 2017 Senate Labor, Health and Human Services appropriations bill. We encourage Congress to continue the effort to establish a pattern of increases for NIH as there are excellent proposals for outstanding research that cannot be funded under current budget levels.

To enhance the nation's capacity for biomedical research, and to build on the momentum from the funding increases provided in FY 2016 and through the 21st Century Cures Act, FASEB recommends at least \$35.0 billion for NIH in FY 2018.



NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) is the only federal agency that supports fundamental research and education across all scientific fields. Its competitive grants to approximately 375,000 researchers, educators, and students in all 50 states comprise approximately 24 percent of federally sponsored basic research at U.S. colleges, universities, and other research institutions across the nation.^{1,2} Moreover, the Foundation's graduate and postdoctoral fellowships and other educational programs underwrite the training of thousands of young scientists and engineers, ensuring the growth of a technical and scientific workforce capable of leading the world in the dynamic industries of the future.

Our economy and quality of life are dependent upon our scientific and engineering prowess. We need to be at the forefront of research so that we can lead the world in innovation and harness the technologies of the future. The breadth and diversity of NSF's portfolio enables the Foundation to capitalize on emerging research, foster interdisciplinary collaboration, and undertake bold, new scientific directions. However, despite its position as a cornerstone of America's basic research enterprise, the budget for NSF has not grown relative to increased research costs, diminishing its ability to keep our nation at the cutting edge of science and train the next generation of scientists and engineers.

The federal government must renew its commitment to support fundamental, discovery-based science.³ Providing NSF with a budget of \$8.0 billion (approximately \$500 million above currently appropriated funding) would put the agency on this course and allow the Foundation to award approximately 600 additional research grants, enabling our nation's researchers to seize upon new scientific opportunities.

FASEB recommends a budget of at least \$8.0 billion in FY 2018 for NSF as a first step towards predictable, sustained growth for our nation's basic research enterprise.

¹ <https://www.nsf.gov/about>

² https://www.nsf.gov/about/budget/fy2017/pdf/05_fy2017.pdf

³ <http://www.amacad.org/pdfs/InnovationAmericanImperativeCalltoAction.pdf>

VETERANS AFFAIRS MEDICAL AND PROSTHETIC RESEARCH PROGRAM

The Department of Veterans Affairs (VA) Medical and Prosthetic Research Program improves the lives of veterans through innovations in basic, translational, clinical, health services, and rehabilitation research. Although VA research primarily focuses on health issues that affect veterans, the entire nation benefits from discoveries supported by the Medical and Prosthetic Research Program. The VA's collaboration with university partners, non-profit organizations, and private industry is a model for the development of innovative research to advance health care and prevention strategies. The research program also enables the VA to recruit and retain a cadre of outstanding physician scientists to care for our nation's veterans.

The VA Medical and Prosthetic Research Program will need a budget of \$713 million (an increase of \$38 million) in FY 2018 in order to maintain purchasing power, support research on conditions common among service members returning from recent conflicts, and address the chronic care needs of the aging veteran population. In addition, there are several areas of VA research that remain critically underfunded including post-deployment mental health issues, substance abuse among veterans, and the long-term effects of exposure to hazardous materials

A significant infusion of funds is also required to ensure that the VA can continue to support the Million Veterans Program (MVP) without reducing resources available for other critical VA research areas. The MVP is a multi-year effort to collect genetic samples and general health information from a diverse group of veterans to understand how genes affect health in order to improve care.

FASEB recommends at least \$713 million for the VA Medical and Prosthetic Research Program in FY 2018 to maintain current service levels, sustain the MVP, and support emerging research areas that lack sufficient funding.

UNITED STATES DEPARTMENT OF AGRICULTURE RESEARCH PROGRAMS

The United States Department of Agriculture (USDA) funds research through an external, competitive grant program, the Agriculture and Food Research Initiative (AFRI), and a program administered by the Agricultural Research Service (ARS). AFRI currently funds approximately 500 research grants at colleges, universities, and other research institutions across the country. In tandem, as part of a long-standing national network to enhance and disseminate agricultural research, ARS supports more than 2,000 researchers at 90 locations throughout the country, and it provides unique facilities and resources that serve the entire agricultural sciences community.^{4,5}

The interdisciplinary research portfolio of USDA brings cutting-edge science to bear on complex agricultural challenges.⁶ Greater investments in agricultural research are needed to address global food demand, sustainability, and to keep the United States at the forefront of innovation in agricultural science.⁷ To address critical needs in agricultural science, AFRI should be funded at its full authorization level of \$700 million (\$350 million above current appropriations), which would support approximately 500 additional research grants. We also recommend a budget of \$1.24 billion for ARS (\$100 million above current appropriations) to begin to rebuild and expand the in-house research capacity at USDA.

FASEB recommends a minimum of \$700 million for AFRI and \$1.24 billion for ARS in FY 2018. These funding levels represent a first step toward a much-needed, long-term commitment to increase research in agricultural science.

⁴ <https://nifa.usda.gov/afri-2014-synopsis-data>

⁵ <https://www.ars.usda.gov/about-ars/>

⁶ <https://www.usda.gov/wps/portal/usda/usdahome?navid=onehealth>

⁷ <https://www.nap.edu/catalog/18652/spurring-innovation-in-food-and-agriculture-a-review-of-the>

DEPARTMENT OF ENERGY OFFICE OF SCIENCE

The Department of Energy Office of Science (DOE SC) is the single largest funder of basic physical sciences research in the nation, awarding competitive, merit-based grants to researchers at universities and research institutions across the country. A multitude of inventions and technologies that have transformed our lives can be traced back to DOE research, including nuclear energy, radiocarbon dating, superconductors, and lithium-ion batteries.⁸

This capacity for discovery comes in large part from DOE SC National Laboratories that house state-of-the-art scientific instrumentation and computing facilities that no single academic or industrial institution could construct or manage on its own. The laboratory facilities provide researchers with unique equipment that allows them to expand the frontiers of knowledge and translate discoveries into new inventions that drive the economy and improve our quality of life. In all, more than 31,000 scientists and engineers from academic institutions and private companies use the DOE labs to advance research and development.⁹

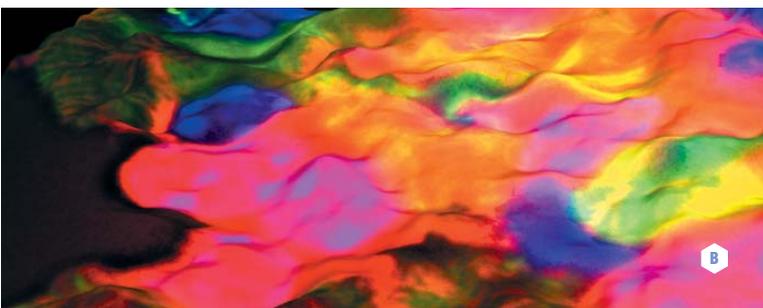
Additional support for DOE SC in the years ahead is necessary to maintain facilities, invest in new instrumentation and equipment, and build new scientific infrastructure at the National Laboratories. An investment of \$5.8 billion (approximately \$450 million above currently appropriated funding) in DOE SC would allow DOE SC to make critical investments in its laboratories and user facilities. This recommendation is consistent with the growth trajectory proposed by the Senate Energy and Natural Resources Committee in its efforts to reauthorize DOE SC.¹⁰

FASEB recommends a budget of at least \$5.8 billion for DOE SC in FY 2018. This increase represents a commitment to the critical research supported by the Department and would bolster the capacity of our National Laboratories and user facilities.

⁸ <https://www.osti.gov/accomplishments/insights.html>

⁹ http://science.energy.gov/~media/budget/pdf/sc-budget-request-to-congress/fy-2017/FY_2017_SC_Congressional_Overview.pdf

¹⁰ [https://www.congress.gov/bills/114th-congress/senate-bill/2012/text/es?q=%7B%22search%22%3A%5B%22s.+2012%22%5D%7D&r=1#toc-idEA45A6B2C16D4BC2ADCCB9CB1E974962](https://www.congress.gov/bills/114/congress/senate/bills/2012/text/es?q=%7B%22search%22%3A%5B%22s.+2012%22%5D%7D&r=1#toc-idEA45A6B2C16D4BC2ADCCB9CB1E974962)



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A SPECIALIZED MICROCARRIERS USED TO GROW LARGE NUMBERS OF ADULT STEM CELLS BY DOUGLAS B. COWAN: A FASEB *BIOART* 2012 WINNING IMAGE

B KIDNEY CELLS FILTERING BLOOD BY IVICA GRGIC ET AL.: A FASEB *BIOART* 2012 WINNING IMAGE

C DEVELOPMENT OF CARTILAGE AND BONE IN MICE BY WILLIAM MUNOZ ET AL.: A FASEB *BIOART* 2016 WINNING IMAGE

D MOLECULAR STRUCTURES OF HIV PROTEINS ASCERTAINED USING CRYSTALLOGRAPHY AND OTHER TECHNOLOGIES BY MARIA VOIGT AND DAVID S. GOODSSELL: A FASEB *BIOART* 2016 WINNING IMAGE



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