



# FASEB

Federation of American Societies  
for Experimental Biology

## FEDERAL FUNDING RECOMMENDATIONS

Biomedical and Related Life  
Sciences Research  
FY 2020

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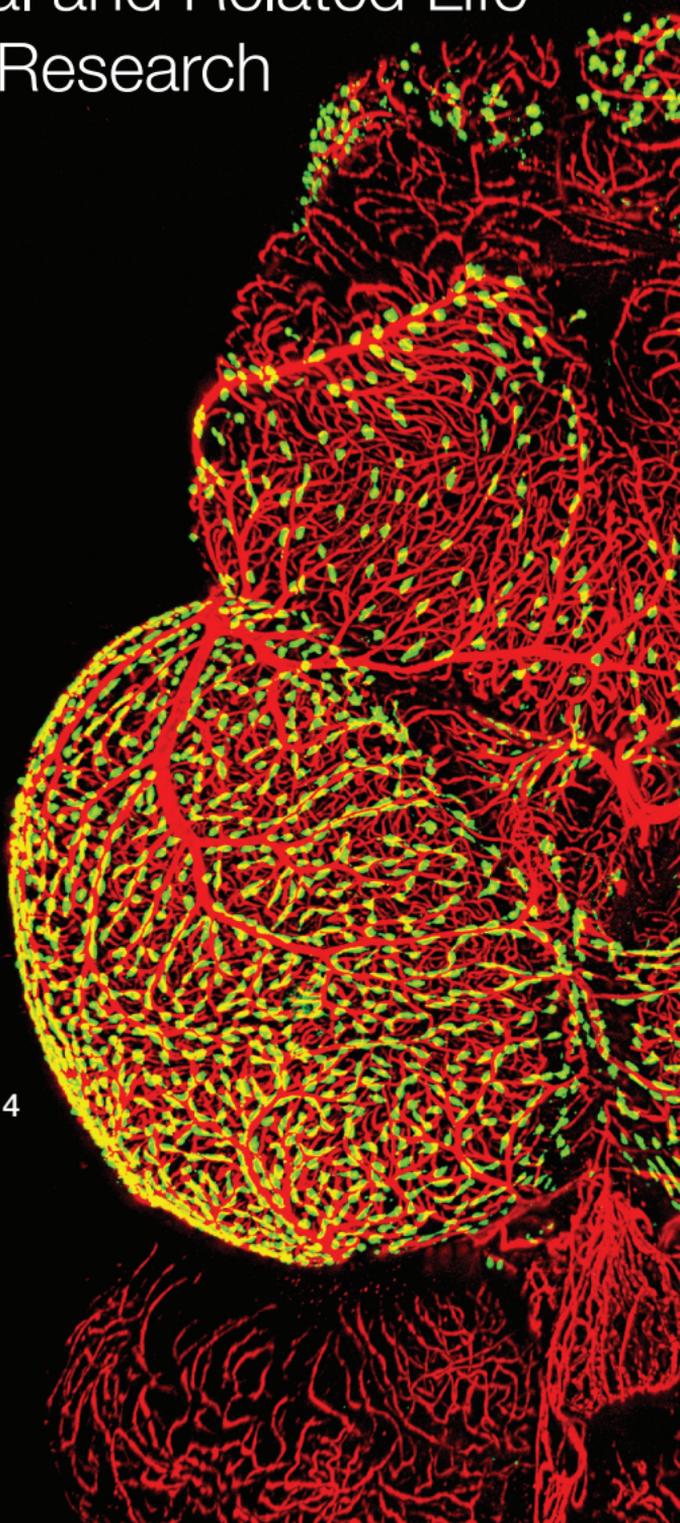
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## FASEB Member Societies

- 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
- American College of Sports Medicine
- Biomedical Engineering Society
- Genetics Society of America
- 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
- Society of Toxicology

## Funding Recommendations

Remarkable progress in the biological and biomedical sciences is enabled by federal investments in investigator-initiated basic research across many fields. Continued improvements in human health, new treatments for life-threatening diseases, and international competitiveness in research all require robust, predictable, and sustained budget increases for science funding agencies.

This brochure presents FASEB's fiscal year (FY) 2020 funding recommendations for the following federal agencies:

### National Institutes of Health (NIH)

- FASEB recommends at least \$41.6 billion for NIH

### National Science Foundation (NSF)

- FASEB recommends at least \$9.0 billion for NSF

### Veterans Affairs (VA) Medical and Prosthetic Research Program

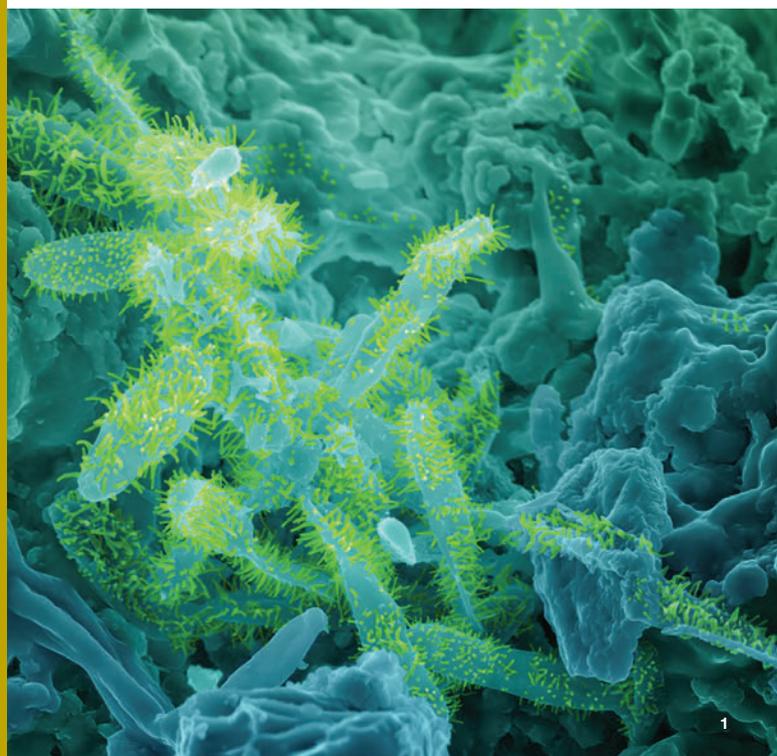
- FASEB recommends at least \$840 million for the VA Medical and Prosthetic Research Program

### United States Department of Agriculture (USDA)

- FASEB recommends at least \$700 million for the USDA Agriculture and Food Research Initiative (AFRI)

### Department of Energy Office of Science (DOE SC)

- FASEB recommends at least \$7.0 billion for the DOE SC



# National Institutes of Health

The National Institutes of Health (NIH) is the nation's largest funder of biomedical research, providing competitive grants to more than 300,000 scientists working at universities, medical schools, independent research institutions, and companies across the country.

NIH is fueling new research breakthroughs that are transforming medicine. For example, a 2018 Nobel Prize recognized NIH-funded basic research that laid the foundation for cancer immunotherapy.<sup>1</sup> And new research may soon lead to more progress: a universal flu vaccine, a cure for sickle-cell disease, and new ways to combat the opioid epidemic.<sup>2,3,4</sup>

Innovations derived from basic biomedical research also lead to new companies and industries. The human genome project alone is estimated to have spurred nearly \$1 trillion of economic activity.<sup>5</sup>

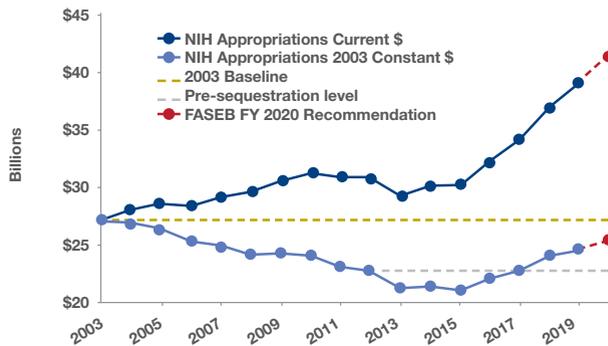
Congress's renewed commitment to NIH has enabled groundbreaking discoveries. But more work must be done to rebuild our nation's research capacity; in real dollars, the NIH budget is approximately 9.5 percent below the FY 2003 level (Figure 1).

The current funding environment makes it difficult for younger scientists to establish and maintain independent research careers, and to pursue innovative scientific directions.<sup>6</sup> Sufficient support is needed for these scientists who represent the future of biomedical research.

A \$41.6 billion budget (\$2.5 billion above FY 2019) would allow NIH to accelerate progress in all areas of biomedical science and help train the next generation of scientists. This funding level could support about 400 additional young investigators; provide \$500 million already authorized through the 21st Century Cures Act for key research initiatives; and bolster other areas in urgent need of additional resources, including investment in new research technologies such as cryogenic electron microscopy.

**FASEB FY 2020 recommendation:  
at least \$41.6 billion for NIH**

Figure 1: NIH Appropriations, FY 2003-2020



1. NIH grantee wins 2018 Nobel Prize in Physiology or Medicine, October, 2018  
 2. Universal Influenza Vaccine Research National Institute of Allergy and Infectious Disease.  
 3. NIH launches initiative to accelerate genetic therapies to cure sickle cell disease, September, 2018  
 4. NIH HEAL Initiative  
 5. Battelle/United for Medical Research. The impact of genomics on the U.S. economy, June 2013  
 6. Sustaining Discovery in the Biological and Biomedical Sciences: A Framework for Discussion. Federation of American Societies for Experimental Biology.

# National Science Foundation

With its broad mandate to support fundamental research across all fields of science, engineering, and mathematics, the National Science Foundation (NSF) is the cornerstone of our nation's scientific enterprise.<sup>7</sup> Web browsers, modern weather forecasting, and magnetic resonance imaging (MRI) are just a few of the tangible benefits enabled by NSF-funded research.<sup>8,9</sup>

Many of these advances result from NSF's relationship to other scientific agencies such as the NIH. For example, in the biological sciences, NSF supports research that expands our understanding of life at multiple scales of time and space, from molecules to ecosystems.<sup>3</sup> NSF supported 2018 Nobel-prize winning research that led to the development of directed enzyme evolution, a revolutionary technology now used to produce pharmaceuticals, biofuels, and pesticide alternatives.<sup>10</sup>

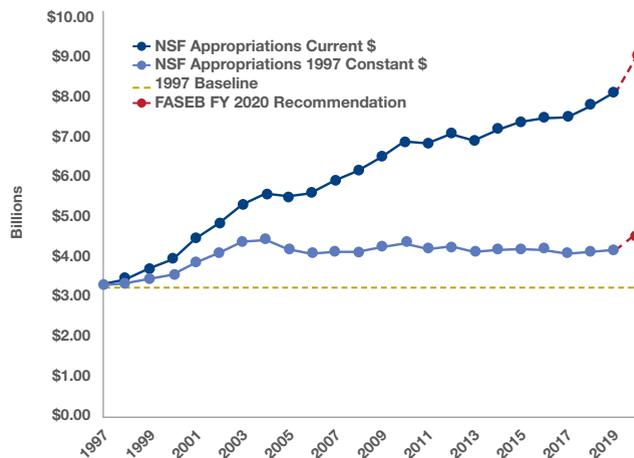
By harnessing expertise and technology from across the sciences, NSF-supported research is crucial in safeguarding our national security and addressing the effects of global warming.

NSF also has a critical educational mission. The Foundation's graduate and postdoctoral fellowships and other educational programs underwrite the training of thousands of young scientists and engineers. This investment ensures a technical and scientific workforce capable of pursuing research and leading the innovative, dynamic industries of the future.

The NSF budget has remained flat in real terms for 15 years (Figure 2). The federal government must renew its commitment to fundamental, discovery-based science.<sup>11</sup> Providing NSF with a budget of \$9.0 billion (\$925 million above FY 2019<sup>12</sup>) would support about 1,000 additional research grants, enabling researchers to rapidly seize new scientific opportunities.

**FASEB FY 2020 recommendation:  
at least \$9.0 billion for NSF**

Figure 2: NSF Appropriations, FY 1997-2020



7. National Science Foundation  
 8. Transforming the World Through Science. National Science Foundation  
 9. NSF Sensational 60. National Science Foundation  
 10. Celebrating 2018 Nobel Laureate Frances Arnold, National Science Foundation  
 11. Innovation: An American Imperative  
 12. H.J. Res. 31—Consolidated Appropriations Act, 2019

## Veterans Affairs Medical and Prosthetic Research Program

The Department of Veterans Affairs (VA) Medical and Prosthetic Research Program improves veterans' lives through innovations in basic, translational, clinical, health services, and rehabilitation research. Although focused on veterans' health issues, all Americans benefit from Medical and Prosthetic Research Program discoveries.

The VA's collaboration with university partners, non-profit organizations, and private industry is a model for 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.<sup>13</sup>

Several areas of VA research remain critically underfunded, including post-deployment mental health, substance abuse, and the long-term effects of hazardous materials exposure. The VA Medical and Prosthetic Research Program needs a budget of at least \$840 million (an increase of \$61 million over FY 2019<sup>14</sup>) in FY 2020 to address these issues, maintain purchasing power, and support research on conditions that are common among service members. The program needs these additional resources to address the chronic care needs of our aging veteran population, including cancer and type-2 diabetes.

A significant infusion of funds is also needed to ensure continued VA support of the Million Veterans Program (MVP) without reducing resources for other VA research areas. MVP is a multi-year effort to collect genetic samples and health information from a large and diverse group of veterans to understand how genes affect human health, ultimately improving care for all individuals.

**FASEB FY 2020 recommendation:  
at least \$840 million for VA Medical  
and Prosthetic Research Program**

13. U.S. Department of Veterans Affairs  
14. H.R.5895 - Energy and Water, Legislative Branch, and Military Construction and Veterans Affairs Appropriations Act, 2019

## United States Department of Agriculture-Agriculture and Food Research Initiative

The rising demand for agricultural products, along with the need for greater food security and improved sustainability, presents unprecedented challenges for the global agricultural system. The United States Department of Agriculture (USDA) funds an interdisciplinary research portfolio that brings cutting-edge science to these complex problems. Key to these efforts is USDA's Agriculture and Food Research Initiative (AFRI) grant program.<sup>15</sup>

AFRI funds agricultural and food sciences research at colleges, universities, and other institutions nationwide.<sup>16</sup> Established by the Farm Bill in 2008, AFRI funding has resulted in numerous advancements, including new cultivars of wheat and better tools for monitoring and preventing avian flu outbreaks.

Additional resources are needed to advance the safety, quality, and nutritive value of food. Childhood obesity and community-based nutrition education programs funded by AFRI help families and communities make informed nutrition choices.<sup>17</sup>

Despite AFRI's progress—and the need for scientifically informed solutions—the program is appropriated at about 50 percent of its full authorization, leaving scores of innovative meritorious proposals unfunded every year.<sup>18</sup> AFRI should be funded at its full authorization of \$700 million (\$285 million above FY 2019<sup>19</sup>), which would support about 400 additional research grants.

**FASEB FY 2020 recommendation:  
at least \$700 million for AFRI**

15. National Institute of Food and Agriculture. U.S. Department of Agriculture  
16. *AFRI Annual Review, Fiscal Year 2016*. U.S. Department of Agriculture  
17. National Institute of Food and Agriculture: Health, U.S. Department of Agriculture  
18. *AFRI 2016 Annual Review, Tables 1 and 2*. U.S. Department of Agriculture  
19. H.J. Res.31 – Consolidated Appropriations Act, 2019



# Department of Energy Office of Science

The Department of Energy Office of Science (DOE SC) is the nation's largest funder of basic physical sciences research. Many transformative innovations and technologies can be traced to DOE SC research, including solar cells, superconductors, and nanotechnology.<sup>20</sup>

This capacity for discovery comes in large part from DOE SC National Laboratories, which house state-of-the-art scientific instrumentation and computing facilities that no single institution could afford to construct or manage. The laboratory facilities provide unique equipment to a very large number of researchers, enabling them to translate discoveries into new inventions that drive the economy and improve quality of life.

Importantly, in FY 2015, nearly 3,000 NIH and NSF-supported scientific projects used DOE SC facilities. In all, more than 32,000 scientists and engineers currently use DOE SC labs for research and development<sup>21,22</sup>—a 14% increase since FY 2015.<sup>23</sup>

The demand for DOE user facilities is growing, necessitating new investments in instrumentation, equipment, and scientific infrastructure. A FY 2020 budget of \$7.0 billion (\$415 million above FY 2019<sup>24</sup>) would support these critical investments and support continued pathbreaking research in emerging areas such as artificial intelligence and quantum technology. This recommendation is consistent with the growth trajectory proposed by the Senate Energy and Natural Resources Committee in reauthorizing DOE SC.<sup>25</sup>

**FASEB FY 2020 recommendation:  
at least \$7.0 billion for DOE SC**

20. *A Remarkable Return on Investment in Fundamental Research: 40 Years of Basic Energy Sciences at the Department of Energy*. U.S. Department of Energy

21. Department of Energy Office of Science FY 2019 Budget Request to Congress: Overview. U.S. Department of Energy

22. Office of Science User Facilities: Fiscal Year 2015. U.S. Department of Energy

23. Department of Energy Office of Science FY 2015 Budget Request to Congress: Overview. U.S. Department of Energy

24. H.R.5895 - Energy and Water, Legislative Branch, and Military Construction and Veterans Affairs Appropriations Act, 2019

25. S. 2012—North American Energy Security and Infrastructure Act of 2016

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