

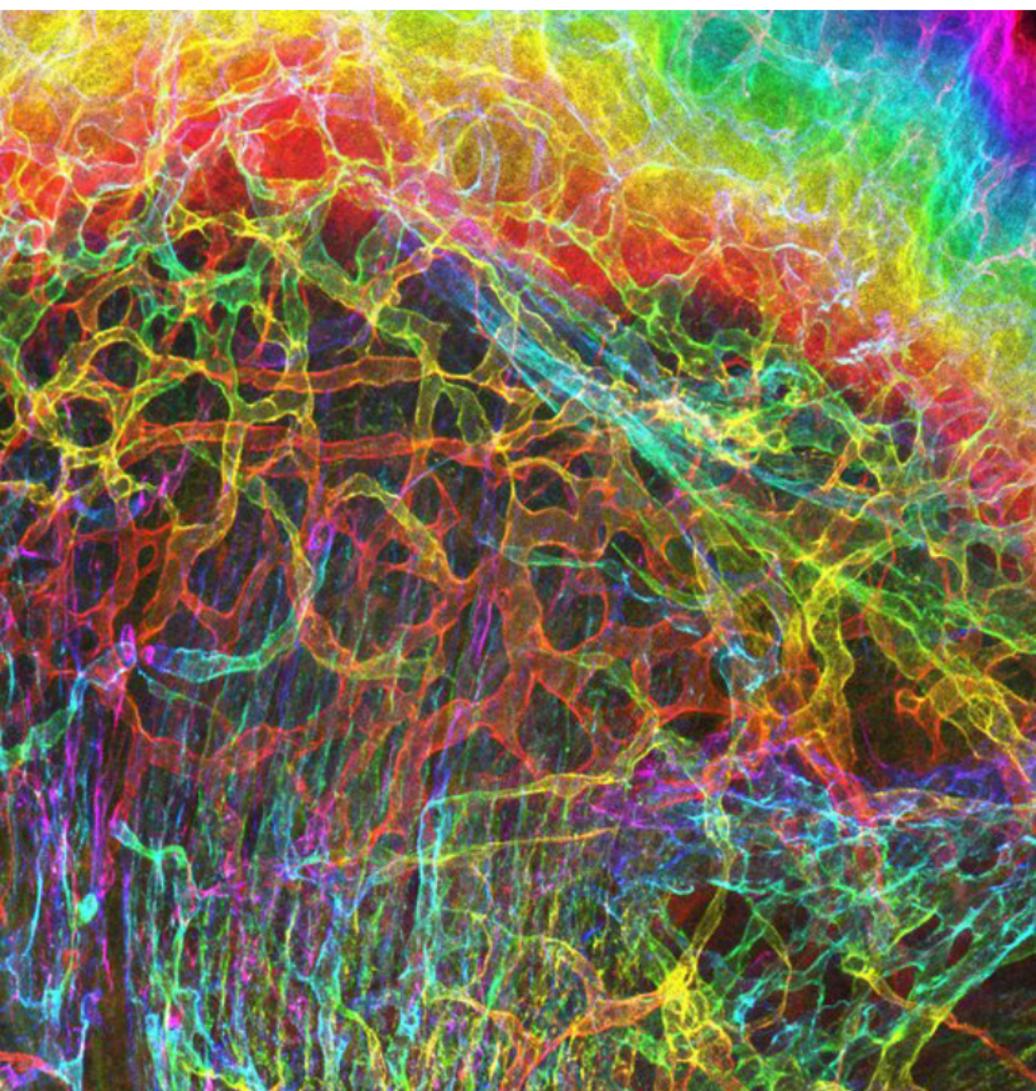


FASEB

Federation of American Societies
for Experimental Biology

Federal Funding Recommendations

Biomedical and Related Life Sciences Research FY 2022



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FASEB Member Societies

FULL MEMBERS

- American Aging Association (AGE) (2016)
- American Association for Anatomy (AAA) (1993)
- The American Association of Immunologists (AAI) (1942)
- American College of Sports Medicine (ACSM) (2005)
- American Federation for Medical Research (AFMR) (2020)
- American Peptide Society (APEPS) (1996)
- American Physiological Society (APS) (1912)
- American Society for Biochemistry and Molecular Biology (ASBMB) (1912)
- American Society for Bone and Mineral Research (ASBMR) (1997)
- The American Society for Clinical Investigation (ASCI) (1998)
- American Society for Investigative Pathology (ASIP) (1913)
- American Society for Nutrition (ASN) (1940)
- American Society for Pharmacology and Experimental Therapeutics (ASPET) (1912)
- The Association of Biomolecular Resource Facilities (ABRF) (1998)
- Association for Molecular Pathology (AMP) (2013)
- Endocrine Society (ES) (1999)
- Environmental Mutagenesis and Genomics Society (EMGS) (2020)
- Genetics Society of America (GSA) (2010)
- The Histochemical Society (HCS) (2011)
- Society for Birth Defects Research & Prevention (formerly The Teratology Society) (1998)
- Society for Developmental Biology (SDB) (1996)
- Society for Glycobiology (SfG) (2012)
- Society for Experimental Biology and Medicine (SEBM) (2016)
- Society for Leukocyte Biology (SLB) (2019)
- Society for Redox Biology and Medicine (SfRBM) (2014)
- Society for the Study of Reproduction (SSR) (1998)
- Society of Toxicology (SOT) (2017)
- U.S. Human Proteome Organization (US HUPO) (2016)

ASSOCIATE MEMBERS

- The American Society of Human Genetics (ASHG) (1999)

Cover photo credit: *Skin/Muscle Interface* by Sarah Lipp of Purdue University and Sarah Calve, PhD, of University of Colorado – Boulder; member, American Association for Anatomy.

Scientific images in this brochure are winners of FASEB's 2020 BioArt competition.

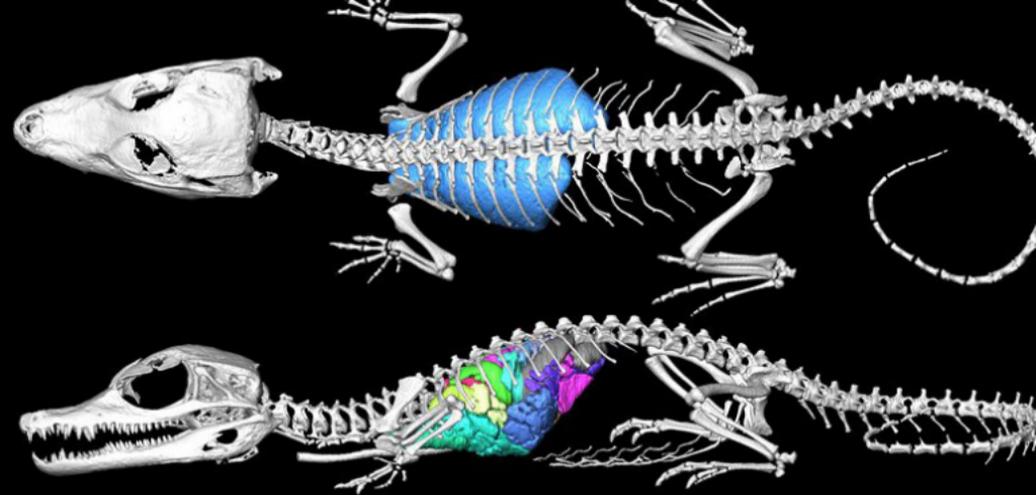


Photo credit: *Crocodilian Lung Biology* by Emma Schachner, PhD; member, American Association for Anatomy

Summary

Federal investments in fundamental research have led to remarkable progress in the biological and biomedical sciences. Basic research was the groundwork for the speed — months instead of years — in the development of COVID-19 vaccines, and pre-clinical research, such as animal studies, has been essential to every step of achieving medical progress.

Despite Congress's bipartisan support for investing in science, federal funding for research has not kept pace, posing a threat to our nation's competitiveness. We face a real threat of losing our edge in industries such as biotechnology if we do not prioritize increasing investments in science and building a diverse workforce.¹ The U.S. spends less on research and development (R&D) than many countries. If the U.S. is to be prepared to respond to future threats, our scientific leadership must progress. According to *Science Is Us*, there is the added benefit of jobs. STEM supports 69 percent of U.S. gross domestic product, touches two out of three workers, and generates \$2.3 trillion in tax revenue.²

The federal government should commit to robust, predictable, and sustained funding increases for science agencies. FASEB's fiscal year (FY) 2022 funding recommendations are as follows:

National Institutes of Health (NIH)

FASEB recommends at least \$46.11 billion for NIH

National Science Foundation (NSF)

FASEB recommends at least \$10 billion for NSF

Department of Energy Office of Science (DOE SC)

FASEB recommends at least \$7.7 billion for the DOE SC

United States Department of Agriculture (USDA)

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

Veterans Affairs (VA) Medical and Prosthetic Research Program

FASEB recommends at least \$902 million for the VA Medical and Prosthetic Research Program

National Institutes of Health

The NIH is the nation's largest funder of biomedical research, providing competitive grants to support the work of 300,000 scientists at universities, medical centers, independent research institutions, and companies nationwide. NIH supports biomedical discoveries, innovations, and treatments that were made possible because of scientific research using animals.

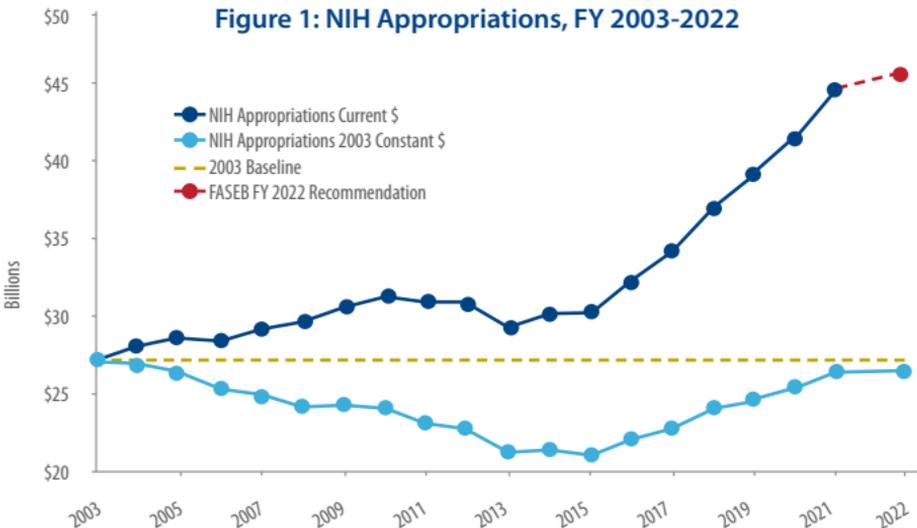
Congress has renewed its commitment to this critical research agency, providing robust, sustained, and predictable budget increases over the last five fiscal years (Figure 1).³ With these resources, NIH has accelerated progress across all areas of medical science, including regenerative medicine, cancer immunotherapy, and neurological health.^{4,5,6} The agency is also committed to supporting the next generation of our biomedical research enterprise.⁷

Though the NIH is in a stronger position than it was a few years ago, Congress must continue to increase biomedical research funding. Our nation is confronting public health threats, especially given global climate change negatively impacting biodiversity and geohealth — the intersection of biological science, Earth sciences, and ecology — on humans. More research will be needed to address increased risks posed by future pandemics, infectious diseases, and greater exposure to environmental pollutants.⁸

In the U.S., we continue to address the needs of an aging population and obesity.^{9,10} NIH research is developing therapies for a whole spectrum of age-related disorders.¹¹ Obesity impacts 42% of the U.S. population and increases the likelihood of developing costly medical conditions.¹²

Our recommendation of \$46.11 billion is \$3.2 billion above FY 2021, allowing NIH to continue support for the Next Generation Researchers Initiative; provide a 5 percent increase across NIH institutes and centers; and expand dual purpose research in biomedicine and agriculture among NIH and other federal agencies.¹³

FASEB FY 2022 Recommendation: at least \$46.11 billion for NIH



Data Source: [NIH Office of Budget](#)

National Science Foundation

With a mandate to support fundamental research across all fields of science, engineering, and mathematics, NSF is the cornerstone of our nation's scientific and innovation enterprise.

Among federal science agencies, NSF has the unique capacity to:

Support multidisciplinary research: By leveraging its portfolio across the sciences, NSF funds cutting-edge research at the interface of the physical, biological, and social sciences to tackle challenges in creative ways, including climate change, biodiversity loss, and geohealth.¹⁴

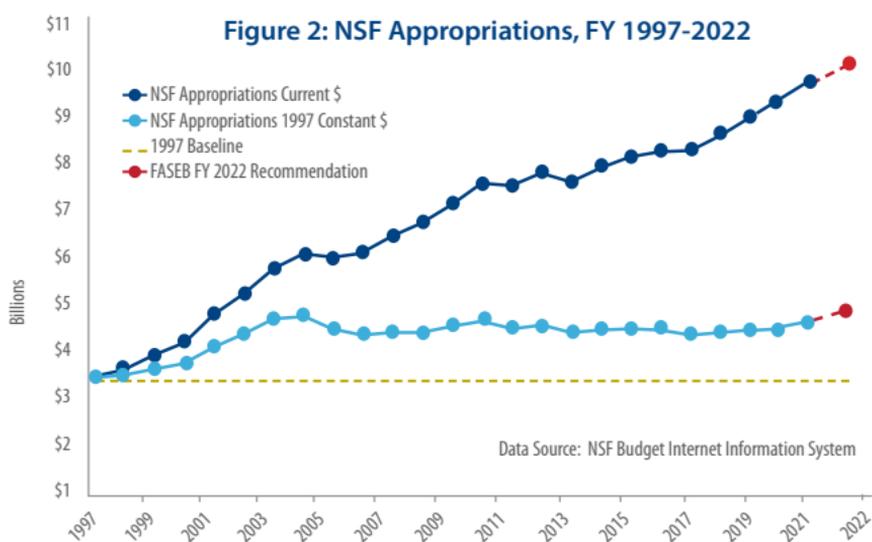
Organize and lead research partnerships at speed and scale: NSF coordinates and leads interagency research endeavors, including partnerships with NIH and DOE SC. These collaborations advance public health and clean energy, the development of artificial intelligence, and other national priorities.¹⁵

Train the next generation of scientists: NSF plays a key role in supporting accessibility of scientific education, training scientists who will work across different scientific disciplines, and broadening participation in science and engineering among underrepresented and diverse groups.¹⁶

Despite its critical role in accelerating science and innovation, NSF's budget has not grown in real terms in nearly 20 years. Recent data demonstrate that NSF was able to fund only 22 percent of the high-quality research proposals that were submitted, rather than the National Science Board recommendation of 30 percent. In FY 2019, approximately \$2.8 billion was requested for about 4,262 declined proposals that were rated Very Good or higher in the merit review process.¹⁷

Our recommendation (\$10 billion) is \$1.5 billion above FY 2021 to support a 5 percent increase across the agency's core research and education programs, establish a new grant program for early-career fellowships as envisioned in congressional legislation, fund more high-quality research proposals, and increase NSF's average award size.^{18,19} NSF could also accelerate key priorities, including Ten Big Ideas, Convergence Accelerators, Partnerships for Innovation, I-Corp, and Mid-Scale Research Infrastructure.^{20,21}

FASEB FY 2022 Recommendation: at least \$10 billion for NSF



Department of Energy Office of Science

The DOE Office of Science (SC) is the nation's largest funder of basic physical sciences research. Transformative innovations and technologies can be traced to its work, including solar cells, superconductors, and nanotechnology.^{22,23}

Agencies like NIH, NSF, and DOE SC work in concert to advance research in key areas, including artificial intelligence and genomics.^{24,25} SC supports the network of DOE national laboratories and builds and operates the most sophisticated, world-class scientific user facilities used by over 34,000 researchers from universities, industry, and other federal agencies.²⁶ National Labs were integral to the creation of the National Virtual Biotechnology Laboratory and the COVID-19 High Performance Computing Consortium that brought together the best minds to address COVID.

Recent budget increases have allowed the office to proceed with key facility upgrades.²⁷ However, for the U.S. to remain at the forefront of science and technology, Congress must sustain and expand DOE SC infrastructure investments.²⁸ A FY 2022 budget of \$7.7 billion (\$674 million above FY 2021) would enable continued critical facilities upgrades and support pathbreaking research in emerging areas such as quantum science.

FASEB FY 2022 recommendation: at least \$7.7 billion for DOE SC

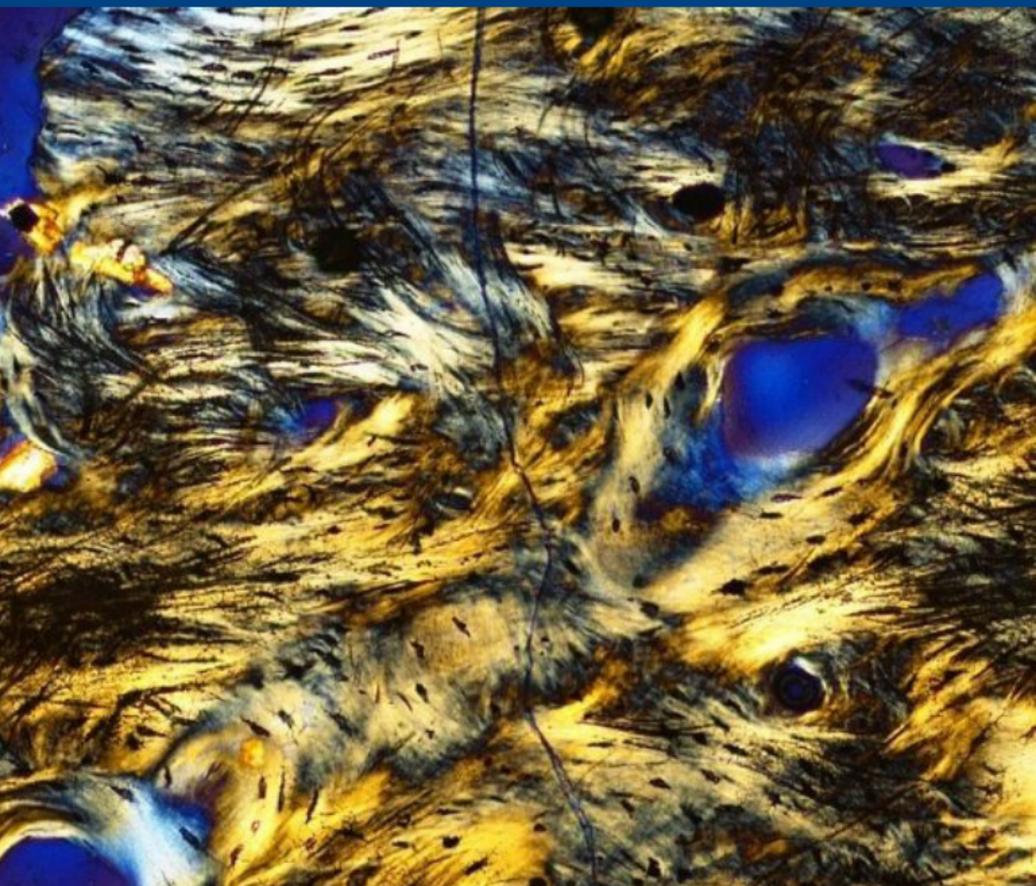


Photo credit: *Turtle Shell* by Heather F. Smith, PhD; member, American Association for Anatomy

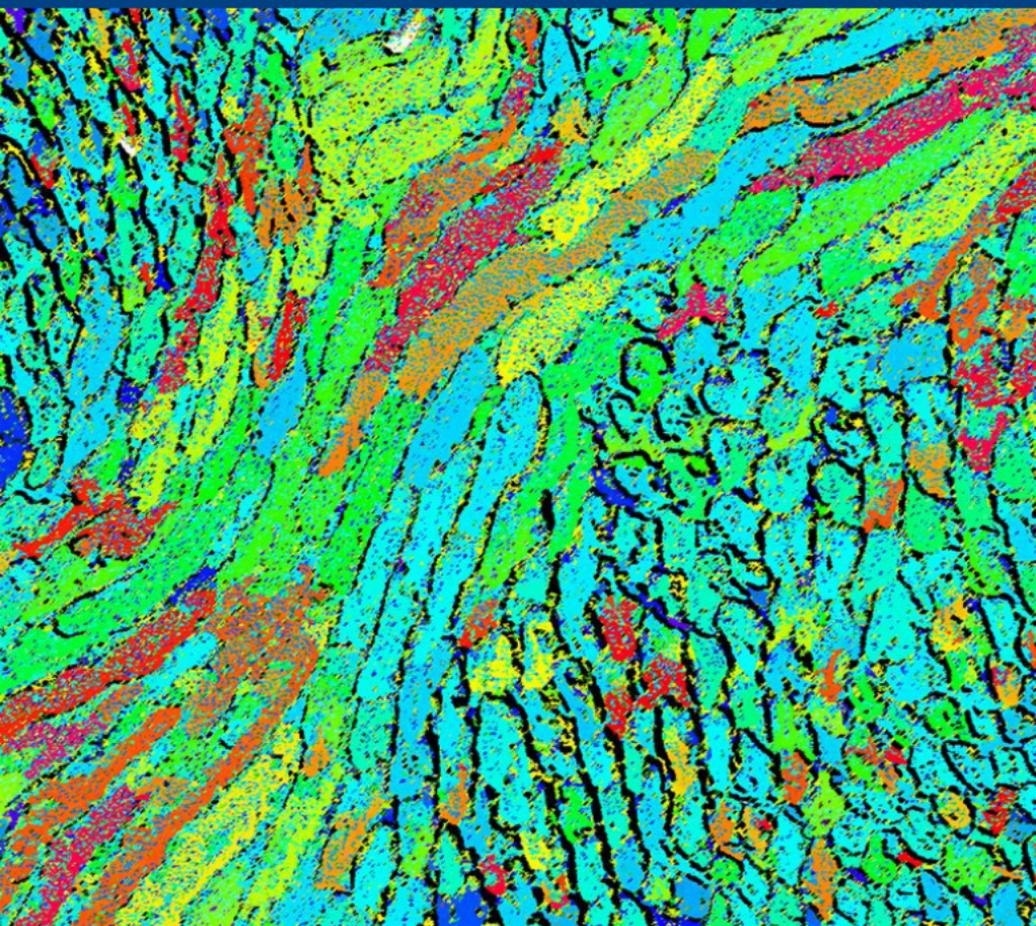


Photo credit: *Human Enamel* by Timothy G. Bromage, PhD; member, American Society for Bone and Mineral Research

USDA Agriculture and Food Research Initiative

Our agricultural system faces unprecedented challenges, including global food and fuel demand, water availability, and training the agricultural workforce. The U.S. Department of Agriculture funds an interdisciplinary research portfolio that brings pioneering science to address complex problems through the Agriculture and Food Research Initiative (AFRI).

AFRI funds agricultural and food sciences research at colleges, universities, and other institutions nationwide. Established by the Farm Bill in 2008, AFRI funding has resulted in numerous advancements, including new wheat cultivars and novel ways to combat invasive species.²⁹

Despite AFRI's progress — and the need for scientifically informed solutions — the program is appropriated at about 60 percent of its authorization, leaving hundreds of innovative proposals unfunded.

AFRI should be funded at its full \$700 million authorization (\$265 million above FY 2021), to fulfill its mission as the leading competitive grants program for agricultural sciences.

FASEB FY 2022 recommendation: at least \$700 million for AFRI

Veterans Affairs Medical and Prosthetic Research Program

The VA Medical and Prosthetic Research Program improves veterans' lives through innovations in basic, translational, and rehabilitation research and vital health services. Although focused on veterans' health, all Americans benefit from VA's collaboration with university partners, non-profits, and private industry to advance research on 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.³⁰

Despite recent increases in appropriations, several areas of VA research remain underfunded, including post-deployment mental health, substance abuse, and the long-term effects of hazardous materials exposure. These conditions are common among service members.

FASEB's recommendation of \$902 million (an increase of \$87 million) for VA research would support meaningful growth above inflation, allowing for rapid translation of findings to improve patient care and develop innovative treatments for veterans. VA also needs resources to enhance new efforts to address COVID-19 and continue support for the Million Veteran Program (MVP). In addition, this funding level would facilitate new investments in VA's IT infrastructure to address the collection and use of big data.

FASEB FY 2022 recommendation: at least \$902 million for VA Medical and Prosthetic Research Program

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Photo credit: South American Cichlid by M. Chaise Gilbert

