No. 25A103

IN THE

Supreme Court of the United States

NATIONAL INSTITUTES OF HEALTH, ET AL.,
Applicants,

v.

AMERICAN PUBLIC HEALTH ASSOCIATION, ET AL.,

On Application to Stay Judgment

BRIEF OF *AMICI CURIAE* AMERICAN SOCIETY FOR BIOCHEMISTRY AND MOLECULAR BIOLOGY, AMERICAN SOCIETY FOR CELL BIOLOGY, AMERICAN SOCIETY FOR MICROBIOLOGY, AND FEDERATION OF AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY IN OPPOSITION TO APPLICATION FOR STAY

KYLE H. KERAGA
VENABLE LLP
750 E. Pratt St.
Suite 900
Baltimore, MD 21202
KHKeraga@Venable.com

MEGAN BARBERO
Counsel of Record
VENABLE LLP
600 Mass. Ave., NW
Washington, DC 20001
Tel: (202) 344-4540
MBarbero@Venable.com

EMILY R. MARCY
VENABLE LLP
1850 Towers Crescent Plaza
Suite 400
Tysons, VA 22182
ERMarcy@Venable.com

Counsel for Amici Curiae

TABLE OF CONTENTS

TABLE OF AUTHORITIES ii

INTEREST OF *AMICI CURIAE* 1

INTRODUCTION AND SUMMARY OF ARGUMENT 2

ARGUMENT 4

I. NIH grants are the foundation of the American scientific enterprise, and grant terminations will close talent pipelines and strand researchers at all stages of their careers. 4

A. Even a temporary loss of grant funding can permanently derail promising scholars during career transitions, draining talent from our scientific community 5

B. The mechanisms for grant-based funding mean that sudden grant terminations will cost jobs and close laboratories, causing lasting damage to scientific progress 10

II. NIH support for biological and biomedical science is indispensable, and its loss will stall critical discoveries that are vital for innovation, knowledge, and human health 15

A. The termination of NIH grants will halt groundbreaking discoveries that have promising implications for health and longevity. 15

B. The loss of NIH funding has stalled ongoing clinical trials, curtailing innovative therapies and endangering patients. 18

C. The loss of federal funding for scientific research will undermine our nation's economy and weaken our geopolitical leadership 20

CONCLUSION 24

TABLE OF AUTHORITIES

Page(s)

Regulations

2 C.F.R. § 200.344 12

Other Authorities

Ass'n of Am. Med. Colls., *Impact of NIH Grant Terminations* (May 27, 2025) 19

Aimee Cho, *Mom with Stage 4 Cancer Approved for Clinical Trial After NIH Funding Cuts Left Her in Limbo*, NBC Washington (Mar. 8, 2025) 20

Alan Burdick, *Trump vs. Science*, New York Times (Apr. 25, 2025) 20

Alex Philippidis, *StockWatch: NIH Indirect Cost Cuts Shake Tools Stocks*, GenEdge (Feb. 17, 2025) 22

Am. Soc'y for Microbiology, *Maximizing Opportunities for Scientific and Academic Independent Careers (MOSAIC) Program* (last visited July 30, 2025) 7, 8

Ana Despa & Sarah Diaz, *Stalled Funding, Canceled Grants: How the NIH Crisis is Affecting Duke*, The Chronicle (June 27, 2025) 9

Angus Chen, et al., *NIH is Shrinking the Number of Research Projects it Funds due to a New Trump Policy*, STAT+ (July 29, 2025) 12

Anil Oza, *NIH Cuts Halt 24-Year Program to Prevent HIV/AIDS in Adolescents and Young Adults*, STAT+ (Mar. 25, 2025) 17

Annie Waldman, et al., *Shattered Science: The Research Lost as Trump Targets NIH*, ProPublica (June 12, 2025) 14

Am. Soc'y for Biomed. & Molec. Biol., *ASBMB MOSAIC* (last visited July 30, 2025) 8

Am. Soc'y for Cell Biol. ("ASCB"), *MOSAIC Program (AMP)* (last visited July 30, 2025) 8

Bentley Univ., *New Study Shows NIH Investment in New Drug Approvals is Comparable to Investment by Pharmaceutical Industry* (Apr. 28, 2023) 16

Brady T. West, *A Michigan Research Professor Explains How NIH Funding Works – and What it Means to Suddenly Lose a Grant*, The Conversation (May 2, 2025) 11, 13

Carolyn Y. Johnson, *His Custom Cancer Therapy is in an NIH Freezer. He May Not Get it in Time.*, Wash. Post (June 18, 2025) 20

Catherine Offord, *Overseas Universities See Opportunity in U.S. 'Brain Drain'*, Science Insider (Mar. 17, 2025) 23

Christine Ro, *The Economic Effects of Federal Cuts to US Science – in 24 Graphs*, Nature (June 25, 2025) 22

Claudia L. Lloreda, *Exclusive: NIH Nixes Funds for Several Pre- and Postdoctoral Training Programs*, Transmitter (Apr. 8, 2025) 8, 14

Courtney Chandler, *When Does a Postdoc End?*, ASBMB Today (Jan. 27, 2023) 6

David A. Montero, et al., *Two Centuries of Vaccination: Historical and Conceptual Approach and Future Perspectives*, Frontiers in Pub. Health (Jan. 9, 2024) 16

Diego A. Reinero, *The Path to Professorship by the Numbers and Why Mentorship Matters*, SpringerNature Research Communities (Oct. 23, 2019) 5

Educations.Com Team, *Study a PhD: A Guide to PhD Degrees* (Apr. 11, 2025) 5

Ekaterina G. Cleary, et al., *Comparison of Research Spending on New Drug Approvals by the National Institutes of Health vs the Pharmaceutical Industry*, JAMA Health F. (Apr. 28, 2023) 16

Elisa Muyl & Anthony Lydgate, *How Trump Killed Cancer Research*, Wired (July 21, 2025) 17

Elaine Chen, *NIH Cancels Funding for Landmark Diabetes Study at a Time of Focus on Chronic Disease*, STAT+ (Mar. 17, 2025) 19

Ellis Preston, *PhD Students Left 'Devastated' from Grant Money Uncertainties*, The State Press (Apr. 8, 2025) 10

Emilee Klein, *UMass Climate Scientists Reeling as Trump Administration Slashes Funding for Research*,
Greenfield Recorder (June 23, 2025) 10

Esther Choo, *I'm a Health Researcher. NIH's Pause on Research Grants Could Have a Devastating Cost.*,
MSNBC (Jan. 24, 2025) 12

Univ. of Oregon Coll. Arts & Sci., *Faculty Directory*
(last visited July 31, 2025) 8

Fed'n of Am. Soc. for Experim. Biol., *FASEB MOSAIC*
(last visited Apr. 24, 2025) 8

Fed'n of Am. Soc. for Experim. Biol., *FASEB Disheartened by MOSAIC Program Termination*
(Apr. 4, 2025), ... 8

Global Biodefense Staff, *NIH Budget Cuts Threaten to Cripple U.S. Biomedical Innovation and Public Health*,
Global Biodefense (July 28, 2025) 11

Haofuzi Zhang & Xiaofan Jiang, *Importance of Clinical Trials and Contributions to Contemporary Medicine: Commentary*,
Ann Med. (Jan. 9, 2025) 18

Harvard Univ., *NIH Grant Process*
(last visited July 30, 2025) 13

Heidi Ledford, *These US Labs Risk Imminent Closure After Trump Cuts*,
Nature (Mar. 28, 2025) 11

Jacqueline Howard, *After NIH Staffing Cuts, Cancer Patient in Clinical Trial Worries She May Lose Crucial Time*,
CNN Health (May 14, 2025) 19, 20

Jacqueline Howard, *Uncertainty Around NIH Funding Leaves Alzheimer's Studies in Limbo*,
CNN (Apr. 24, 2025) 17, 18, 19

Jake Miller, *A Brief History of Federal Funding for Basic Science*,
Harv. Med. (Apr. 2025) 2, 14, 16

Jason Mast, *Columbia Scientists Reel as Trump Administration Cancels Grants, Hitting Broad Suite of Research*,
STAT+ (Mar. 11, 2025) 17, 19

Jessica Glenza, *Private Firms are Trying to Fill Research Gaps, but Their 'Puny' Budgets are No Match for Federal Funds*,
The Guardian (May 1, 2025) 14

Jeff Robinson, *UTMB Researcher Says NIH Cuts Have Cost University Millions*,
The Daily News: Galveston County (June 4, 2025) 10

Joe Riad, *A PhD Examined: Academia vs. Industry*,
Medium (Oct. 13, 2024) 6

Killian Baarlaer, *UofL Loses Roughly $1 Million of NIH Research Funding, Stoking Concerns Among Scientists*,
Courier J. (June 6, 2025) 9

Kalynda G. Stokes, et al., *New MOSAIC Funding Opportunities and Upcoming Webinar*,
Nat'l Insts. of Gen. Med. Scis. (July 24, 2024) 7

La. Clinical & Translational Sci. Ctr., *NIH Webinar: MOSAIC K99 Program to Promote Faculty Diversity*
(Aug. 29, 2024) 7

Larry Luxner, *Rare Disease Researchers Warn NIH Budget Cuts Could Threaten Progress and Endanger Lives*,
Rare Disease Advisor (Apr. 2, 2025) 11

Laurie Udesky & Jack Leeming, *Exclusive: A Nature Analysis Signals the Beginnings of a US Science Brain Drain*,
Nature (Apr. 22, 2025) 23, 24

Marcelo Jauregui-Volpe, *New Brief Finds NIH has Canceled $1.9 Billion in Grants*,
Ass'n of Am. Univs. (May 9, 2025) 16

Meg Tirrell, *NIH Froze Funding for Clinical Trials at a Major University. By Fall, They'll Run Out of Funding*,
Wral News (June 23, 2025) 17

Megan Molteni, et al., *NIH Grants Plummeted $2.3 Billion in Trump's First Months, as Federal-Academia Partnership Crumbles*,
STAT+ (Apr. 24, 2025) 15

Michael T. Nietzel, *NIH Grant Cuts Already Costing Institutions $3.8 Billion, Study Finds*,
Forbes (June 14, 2025) 4, 19

Michael T. Nietzel, *NIH Grants Fueled $95 Billion in FY 2024 Economic Activity, Finds New Report*,
Forbes (Mar. 12, 2025) 21

Mohammad S. Jalali & Zeynep Hasgul, *Potential Trade-Offs of Proposed Cuts to the US National Institutes of Health*,
JAMA Health F. (July 25, 2025) 3, 4, 13

Nat'l Acad. of Scis., *Allocating Federal Funds for Science and Technology*, Nat'l Lib. of Med. (1995) 15

Nicole C. Woitowich, et al., *Analysis of NIH K99/R00 Awards and the Career Progression of Awardees*, eLife (Jan. 19, 2024) 7

Nat'l Inst. of Allergy and Infectious Diseases, *Comparing Popular Research Project Grants—R01, R03, and R21* (Apr. 9, 2024) 7

Nat'l Heart, Lung & Blood Inst., *Coronary Heart Disease Research* (last visited July 31, 2025) 2, 16

Nat'l Insts. of Health, *Direct Economic Contributions* (Apr. 18, 2025) 2, 14, 21

Nat'l Insts. of Health, Off. of Extramural Rsch., *NIH Grants Policy Statement: Section 18.3.3* (Apr. 2024) 12

Nat'l Insts. of Health, Off. of Extramural Rsch., *NIH Grants Policy Statement: Section 5.3* (Apr. 2024) 12

Nat'l Insts. of Health, Off. of Extramural Rsch., *NIH Grants Policy Statement: Section 7.3* (Apr. 2024) 11

Nat'l Insts. of Health, Off. of Extramural Rsch., Notice of Funding Opportunity, USA.gov (last visited July 31, 2025) 8

Nat'l Insts. of Health, *Activity Codes* (last visited July 31, 2025) 6, 7

Nat'l Insts. of Health, *Finding a Clinical Trial* (Apr. 24, 2025) 19

Nat'l Insts. of Health, *Grants Process: Review* (Aug. 16, 2024) 13

Nat'l Insts. of Health, *NIH All About Grants Podcast: To Resubmit or Not* (Oct. 5, 2021) 13

Nat'l Insts. of Health, *Pathway to Independence Awards (K99/R00)* (Feb. 27, 2025) 4, 7

Nat'l Insts. of Health, *Post-doctoral Transition Award (K00)* (last visited July 30, 2025) 6

Nat'l Insts. of Health, *Promotional Materials: "Why NIH Clinical Research Matters" PowerPoint Presentation* (Jan. 17, 2025) 18

Nat'l Insts. of Health, *Spurring Economic Growth* (Jan. 17, 2025) 21

Nat'l Insts. of Health, *The Basics: What are Clinical Trials and Why Would I Want to Take Part?* (Apr. 24, 2025) 18

Nat'l Insts. of Health, *The Role of Nuclear Factor Erythroid 2-Related Factor 2 in Sarcopenic Obesity*, NIH Reporter (last visited July 31, 2025) 8

Nina Lakhani, *'A Disaster for All of Us': US Scientists Describe Impact of Trump Cuts*, The Guardian (July 20, 2025) 3, 9

Protect Our Care, *"It's A Bloodbath": Trump Administration Slashes Millions in NIH Funding for Maternal Health, HIV, and Other Research* (Mar. 26, 2025) 17

Rachel Nuwer, *U.S. Budget Cuts are Robbing Early-Career Scientists of Their Future*, Sci. Am. (July 3, 2025) 10, 14

Rebecca Mandt, et al., *Federal R&D Funding: The Bedrock of National Innovation*, MIT Sci. Pol'y Rev. (Aug. 20, 2020) 23

Rebecca L. Siegel, et al., *Cancer Statistics, 2023*, Am. Cancer Soc'y (Jan. 2023) 2, 16

Rosalind Adams, *Trump Makes Sweeping HIV Research and Grant Cuts: 'Setting Us Back Decades'*, The Guardian (Mar. 31, 2025) 3, 5

Sara Moniuszko, *How Trump Health Agency Cuts Could Impact Alzheimer's Research and Patients*, CBS News (Apr. 7, 2025) 17

Sara Reardon, et al., *U.S. Scientists' Lives and Careers Are Being Upended. Here are Five of Their Stories*, Science (May 2, 2025) 14

Sci. & Techn. Action Comm., *China is a Determined and Formidable Competitor with the U.S. in Science & Technology* (last visited Apr. 24, 2025) 22, 23

Sci. Coalition, *American-Made Innovation: Sparking Economic Growth* (2025) 21

Simon Tripp & Martin Grueber, *The Economic Impact and Functional Applications of Human Genetics and Genomics*, Am. Soc'y of Hum. Genetics (May 2021) 16

Smriti Mallapaty, *Exclusive: NIH Grant Rejections Have More Than Doubled Amid Trump Chaos*, Nature (May 19, 2025) 12

Sonia N. Young, et al., *Factors Affecting PhD Student Success*, Int'l J. Exercise Sci. (Jan. 1, 2019) 6

Tracey Thomas, *Practical Paths for Promising Professors*, Science (Nov. 17, 2000) 5

Univ. of Louisiana at Lafayette, *Careers That Require a PhD or Doctoral Degree* (Oct. 23, 2022) 5

Vannevar Bush, Science: The Endless Frontier (July 1945) 2

Wei Yang Tham, et al., *Scientific Talent Leaks Out of Funding Gaps*, U.S. Census Bureau (Feb. 11, 2024) 3, 13

Yoana Cholteeva, *Cuts to FDA and NIH Will Hurt Health Tech Startups, Investors Warn*, Glob. Corp. Venturing (May 2, 2025) 21

Yueran Duan, et al., *Postdoc Publications and Citations Link to Academic Retention and Faculty Success*, PNAS (Jan. 21, 2025) 6

INTEREST OF *AMICI CURIAE*[1]

Amici curiae are four nonprofit biological and biomedical societies (the "Societies") that support scholars pursuing cutting-edge research at America's leading scientific institutions:

- The American Society for Biochemistry and Molecular Biology (ASBMB) supports 11,000 researchers dedicated to advancing discovery in molecular science. Their work has driven advancements in medicine, agriculture, and engineering.
- The American Society for Cell Biology (ASCB) was founded in 1960 with the mission of cultivating a multidisciplinary scientific community focused on the cell, the basic unit of all life. ASCB consists of 6,000 leading researchers, including 32 Nobel laureates.
- The American Society for Microbiology (ASM) is one of the oldest and largest life science societies in the United States, supporting over 37,000 scientific researchers. Its members support research to detect and diagnose infectious diseases.
- The Federation of American Societies for Experimental Biology (FASEB), founded in 1912, is a federation of 22 societies representing more than 110,000 researchers. FASEB hosts multiple scientific conferences, publishes scientific journals, and provides its members with career resources.

Together, the Societies' members have pioneered breakthroughs that improve the lives of millions of Americans and power our nation's economy. And they have invested substantial resources in cultivating the next generation of science leaders, including by participating in the career development portion of the National Institutes of Health's (NIH) Maximizing Opportunities for Scientific and Academic Independent Careers (MOSAIC) grant program.

---

[1] No party or party's counsel authored this brief in whole or in part, and no party or party's counsel made a monetary contribution intended to fund the preparation or submission of this brief. No person other than *amici curiae* or their counsel made a monetary contribution to fund this brief's preparation or submission.

INTRODUCTION AND SUMMARY OF ARGUMENT

American science is an unrivaled engine of discovery, innovation, and progress. That engine is fueled by an enduring partnership between the NIH and our research institutions. After World War II, the government made an unwavering commitment to scientific research.[2] But rather than go it alone, with its own facilities and staff, the government elected to partner with scientific institutions by offering competitive research grants. NIH is now the largest funder of biomedical research in the world.[3] NIH grants support early-career researchers and keep brilliant talent flowing into our research institutions. They enable lifesaving discoveries, reducing cancer deaths by 33% and cardiac deaths by 70% in the last half century alone.[4] They supercharge our economy, strengthen our national security, and ensure our global preeminence. And they are an excellent return on public investment, producing $2.56 in total economic output for every $1.00 in federal input.[5]

NIH's grant terminations have imperiled that remarkable enterprise, with immediate, lasting consequences for emerging researchers, institutions, and discovery. Early-career researchers rely on NIH grants to complete their educations and secure

---

[2] Jake Miller, *A Brief History of Federal Funding for Basic Science*, Harv. Med. (Apr. 2025), https://tinyurl.com/3ptau7cd; *see also* Vannevar Bush, Science: The Endless Frontier 17 (July 1945), https://tinyurl.com/4wed3czu.

[3] NIH, *Direct Economic Contributions* (Apr. 18, 2025), https://tinyurl.com/pefhb9fx.

[4] *See* Nat'l Heart, Lung & Blood Institute, *Coronary Heart Disease Research* (last visited July 31, 2025), https://tinyurl.com/2c3u4a2p; Rebecca L. Siegel, et al., *Cancer Statistics, 2023*, Am. Cancer Soc'y (Jan. 2023), https://tinyurl.com/tw9cyjpr. TA \l "Rebecca L. Siegel et al., *Cancer Statistics, 2023*, Am. Cancer Soc'y (Jan. 2023), https://tinyurl.com/tw9cyjpr" \s "Rebecca L. Siegel et al., Cancer Statistics, 2023, Am. Cancer Soc'y (Jan. 2023), https://tinyurl.com/tw9cyjpr" \c 1

independent faculty positions. Laboratories require NIH funding to employ faculty, support students, and conduct state-of-the-art research. Even a temporary disruption in NIH funding will endanger careers and jeopardize ongoing experiments. In the last five months, grant cancellations have stranded emerging researchers in career transitions and forced "unprecedented funding cuts and staff layoffs" at our institutions.[6] As a study published mere days ago observed, even a brief pause in NIH funding can "increase research personnel unemployment by 40%" and "reduce . . . publication rates by 90%."[7] The lengthy grant application pipeline and lack of adequate private-sector funding sources will make these losses irreparable.

The government largely avoids discussing these harms because it has no answer for them. Gov. Br. 37-38. And its vague assurance that "a stay would not end scientific research," Gov. Br. 38, rings hollow. The mass termination of NIH grants has ground research to a halt, with "innumerable downstream effects on the rest of healthcare" that will "set[] us back decades."[8] Experiments on the precipice of major breakthroughs have been shuttered, with dim prospects of renewal. Clinical trials pioneering new therapies have abruptly ended, endangering patients seeking treatment for grave conditions. These irreparable harms to basic science, discovery, and

---

[6] Nina Lakhani, *'A Disaster for All of Us': US Scientists Describe Impact of Trump Cuts*, The Guardian (July 20, 2025), https://tinyurl.com/4wujhu3b.

[7] Mohammad S. Jalali & Zeynep Hasgul, *Potential Trade-Offs of Proposed Cuts to the US National Institutes of Health*, JAMA Health F. (July 25, 2025), https://tinyurl.com/2b9atj4k (citing Wei Yang Tham, et al., *Scientific Talent Leaks Out of Funding Gaps*, U.S. Census Bureau (Feb. 11, 2024), https://tinyurl.com/vjacv9et).

[8] Rosalind Adams, *Trump Makes Sweeping HIV Research and Grant Cuts: 'Setting Us Back Decades'*, The Guardian (Mar. 31, 2025), https://tinyurl.com/4z3f2evx.

health will only deepen if this Court grants the government's application for a stay. And each day's delay further exacerbates the harm, jeopardizing American science, innovation, economic stability, and global primacy.

Amici offer this brief to illustrate those distinct dangers, and to highlight the irreparable injuries already rippling across the scientific community due to the mass termination of NIH grants—particularly those at issue here. As some of the nation's largest biological and biomedical research societies, *amici* urge this Court to deny the application for a stay.

ARGUMENT

I. NIH grants are the foundation of the American scientific enterprise, and grant terminations will close talent pipelines and strand researchers at all stages of their careers.

The government's mass termination of NIH grants will have dire consequences for researchers and institutions. NIH grants offer students a bridge to independence, and allow faculty to run their labs, pay their staff, and fund state-of-the-art research.[9] But as of this June, more than 2,200 NIH grants have been terminated,[10] compromising scientists, students, and staff.[11] The resulting loss of talent and infrastructure will "limit[] research institutions' training capacity, reduc[e] the number of trained researchers, and weaken[] the innovation ecosystem."[12] Because there is no good alternative to federal funding, there is no path to recovery once these losses are

[9] *See, e.g.*, NIH, *Pathway to Independence Awards (K99/R00)* (July 11, 2025), https://tinyurl.com/ynwsj3w6.

[10] Michael T. Nietzel, *NIH Grant Cuts Already Costing Institutions $3.8 Billion, Study Finds*, Forbes (June 14, 2025), https://tinyurl.com/9vw7fm7v.

[11] *See* Nietzel, *supra* note 10.

[12] Jalali & Hasgul, *supra* note 7.

incurred.[13] The court of appeals was right to find that a stay will cause "economic and non-economic harms" to the plaintiffs, "the public at large, and to the scientific and medical advancements of the United States." App. 34a. These harms are far "weightier," App. 34a, than any harm on the government's side of the ledger.

A. Even a temporary loss of grant funding can permanently derail promising scholars during career transitions, draining talent from our scientific community.

The path to becoming a biomedical scientist requires years of arduous study. Nearly all academic positions, and many industry roles, require applicants to hold a doctoral degree (PhD).[14] PhDs are the pinnacle of scientific education and training, requiring scholars to spend an average of 5 to 7 years building foundational research skills, working in a lab, publishing papers, and exploring a novel thesis of their own.[15] And that's not all. Scientists who wish to start their own labs as tenure-track faculty typically must continue their training by pursuing postdoctoral fellowships following their PhDs.[16] Postdoctoral fellows (postdocs) hold their positions for indefinite time—often spending 5 to 6 more years working in a new lab before they stand a serious

---

[13] *See* Adams, *supra* note 8.

[14] *See* Diego A. Reinero, *The Path to Professorship by the Numbers and Why Mentorship Matters*, SpringerNature Rsch. Cmtys. (Oct. 23, 2019), https://tinyurl.com/3s69tjtv; Univ. of La. at Lafayette, *Careers That Require a PhD or Doctoral Degree* (Oct. 23, 2022), https://tinyurl.com/4z34k7nx.

[15] *See* Educations.Com Team, *Study a PhD: A Guide to PhD Degrees* (June 17, 2025), https://tinyurl.com/273uw6vj.

[16] *See* Tracey Thomas, *Practical Paths for Promising Professors*, Science (Nov. 17, 2000), https://tinyurl.com/3e5amf6w.

chance at gaining a faculty position.[17] Becoming a professor can thus require a decade or more of doctoral education and postdoctoral training.

Given the length and rigor of this process, even promising scholars exhibit high rates of attrition during these transitions. Dropout rates for PhD students range from 36% to 51%,[18] and over 40% of postdocs leave academia altogether.[19] Often, our top talent abandons their research careers because other options are more lucrative or manageable—whether due to accessibility, pay and benefits, family obligations, or myriad other circumstances.[20]

To counteract attrition and maintain a robust pipeline for American scientists, the NIH offers "transition grants" to help researchers move from dependent PhD and postdoctoral roles to independent faculty positions.[21] NIH offers these grants at each inflection point. First, the F99/K00 grant offers third- and fourth-year PhD students 1 to 2 years of PhD funding (F99)[22] and 3 to 4 years of postdoctoral funding (K00).[23]

---

[17] *See* Courtney Chandler, *When Does a Postdoc End?*, ASBMB Today (Jan. 27, 2023), https://tinyurl.com/md5fztea.

[18] Sonia N. Young, et al., *Factors Affecting PhD Student Success*, Int'l J. Exercise Sci. (Jan. 1, 2019), https://tinyurl.com/2hf4vbdk.

[19] Yueran Duan, et al., *Postdoc Publications and Citations Link to Academic Retention and Faculty Success*, PNAS (Jan. 21, 2025), https://tinyurl.com/34xysxyr.

[20] *See, e.g.*, Joe Riad, *A PhD Examined: Academia vs. Industry*, Medium (Oct. 13, 2024), https://tinyurl.com/422jf46d (explaining, by way of anecdote and analysis, one postdoc's decision to pursue industry roles over academia).

[21] NIH, *Activity Codes* (last visited July 30, 2025), https://tinyurl.com/yn2mx9yw (listing and describing the types and functions of NIH grants).

[22] NIH, *Predoctoral to Postdoctoral Fellow Transition Award (F99)* (last visited July 30, 2025), https://tinyurl.com/y7h3da6z.

[23] NIH, *Post-doctoral Transition Award (K00)* (last visited July 30, 2025), https://tinyurl.com/msm3x84w ("The purpose of the [F99/K00 award] is to encourage and retain outstanding graduate students who have demonstrated potential and interest in pursuing careers as independent researchers.").

Second, the K99/R00 grant helps postdocs apply for faculty roles with 1 to 2 years of postdoctoral funding (K99) and 3 more years of independent research support (R00).[24] In turn, these awards make new faculty more competitive for project grants necessary to launch their laboratories—including discrete research grants (R01), small research awards (R03), developmental projects (R21), and more.[25] Ultimately, scientists who receive transition grants achieve independence more successfully than others, with approximately 89% of awardees earning faculty roles.[26]

In 2019, NIH launched the MOSAIC program—a variant of the K99/R00 grant that supports early-career scholars committed to expanding opportunity in science.[27] The program is merit-based, selecting scholars based on the quality of their research and their "proposed compelling future plans to promote broad participation in the biomedical research workforce."[28] Building upon the K99/R00, it includes a career development award for a sponsoring organization.[29] Each grant recipient is assigned

---

[24] NIH, *supra* note 9 ("The NIH Pathway to Independence Award (K99/R00) is for promising postdoctoral scientists seeking to complete needed, mentored research career development.").

[25] NIH, *supra* note 21; *see also* Nat'l Inst. of Allergy and Infectious Diseases, *Comparing Popular Research Project Grants—R01, R03, and R21* (Apr. 9, 2024), https://tinyurl.com/6re5v2ft.

[26] Nicole C. Woitowich, et al., *Analysis of NIH K99/R00 Awards and the Career Progression of Awardees*, eLife (Jan. 19, 2024), https://tinyurl.com/mrys3skj.

[27] *See* ASM, *ASM Maximizing Opportunities for Scientific and Academic Independent Careers (MOSAIC) Program* (last visited July 30, 2025), https://tinyurl.com/mrx6vxy3.

[28] La. Clinical & Translational Sci. Ctr., *NIH Webinar: MOSAIC K99 Program to Promote Faculty Diversity* (Aug. 29, 2024), https://tinyurl.com/3fm28xv6.

[29] Kalynda G. Stokes, et al., *New MOSAIC Funding Opportunities and Upcoming Webinar*, Nat'l Insts. of Gen. Med. Scis. (July 24, 2024), https://tinyurl.com/3up9c25t.

to one of those organizations for mentorship and career development opportunities.[30] The *amici* Societies participate in this initiative by offering game-changing programs for scholars, such as lab management training,[31] research skills development,[32] grant writing workshops,[33] and "match-making visits for scholars."[34] Today, the MOSAIC program has a proven track record of successfully supporting grant recipients in their transitions to faculty roles.[35]

The loss of these essential transition grants can jeopardize a scholar's career. Scientists who attain K99/R00 grants such as MOSAIC are "emerging leaders in their respective scientific disciplines . . . at critical junctures within their careers."[36] When those grants are withheld, research is stalled; new faculty are laid off or furloughed; and students are stranded midway through extensive doctoral or postdoc programs.[37]

---

[30] NIH Off. of Extramural Rsch., *Notice of Funding Opportunity*, USA.gov (last visited July 31, 2025), https://tinyurl.com/6n6ee3sb (Expired); *see also* ASM, *supra* note 27; ASBMB, *ASBMB MOSAIC* (last visited July 30, 2025), https://tinyurl.com/mv9a6m6n; ASCB, *MOSAIC Program (AMP)* (last visited July 30, 2025), https://tinyurl.com/hhxr5dy7; FASEB, *FASEB MOSAIC* (last visited July 30, 2025), https://tinyurl.com/yndt3rhu.

[31] ASM, *supra* note 27.

[32] FASEB, *supra* note 30.

[33] ASBMB, *supra* note 30.

[34] ASCB, *supra* note 30.

[35] For example, nearly all MOSAIC scholars in ASBMB's 2021 and 2022 cohorts have faculty roles, and members of its 2023 and 2024 cohorts have hit the faculty market early. *See, e.g.*, NIH, *The Role of Nuclear Factor Erythroid 2-Related Factor 2 in Sarcopenic Obesity*, NIH Reporter (last visited July 31, 2025), https://tinyurl.com/e5ut29up (written by MOSAIC scholar who attained faculty role); Univ. of Oregon Coll. Arts & Sci., *Faculty Directory* (last visited July 31, 2025), https://tinyurl.com/3pxv83ff (featuring MOSAIC scholar who attained faculty role).

[36] FASEB, *FASEB Disheartened by MOSAIC Program Termination* (Apr. 4, 2025), https://tinyurl.com/2wr93scz.

[37] *See* Claudia L. Lloreda, *Exclusive: NIH Nixes Funds for Several Pre- and Post-doctoral Training Programs*, Transmitter (Apr. 8, 2025), https://tinyurl.com/3ekeasyc

Multiple MOSAIC grant recipients have seen their funding pulled during important career transition periods. *See, e.g.*, D. Ct. Dkt. Nos. 38-21, 38-35, 38-36, 38-37, 38-41. One postdoc earned a MOSAIC grant to study gene expression in cancer cells. D. Ct. Dkt. No. 38-35. This researcher had received a faculty role, and was set to open a new lab in the fall. *Id.* But because the NIH terminated this grant in April, this researcher cannot hire staff or purchase equipment, and is now at risk of losing their offer. *Id.* Another postdoc had her MOSAIC grant pulled during her faculty search. D. Ct. Dkt. No. 38-41. The loss of funds has negatively impacted her faculty interviews, and led her to reconsider her future in academia altogether. *Id.*

These harms are accelerating daily, as institutions nationwide now face "unprecedented funding cuts and staff layoffs" due to the termination of NIH grants.[38] Duke University has been forced to lay off research associates and reduce the size of new PhD classes.[39] At the University of Louisville, PhD students have lost training opportunities and seen research on potentially groundbreaking treatments delayed.[40] The University of Texas has halted several research projects and left vacant positions

("Program directors and grantees are scrambling to continue supporting their students.").

[38] Lakhani, *supra* note 6.

[39] Ana Despa & Sarah Diaz, *Stalled Funding, Canceled Grants: How the NIH Crisis is Affecting Duke*, The Chronicle (June 27, 2025), https://tinyurl.com/37jmhhwv.

[40] Killian Baarlaer, *UofL Loses Roughly $1 Million of NIH Research Funding, Stoking Concerns Among Scientists*, Courier J. (June 6, 2025), https://tinyurl.com/2v5z5urw (noting that one professor "had to redistribute funding intended to bring on a new research coordinator to keep [the postdoctoral fellow] on her team . . . . but he will now have to shift some of his focus toward simpler tasks, slowing down progress on studying a potentially 'groundbreaking' treatment").

unfilled.[41] Johns Hopkins scientists have had no choice but to terminate postdocs and research assistants due to funding shortfalls.[42] And at institutions like Arizona State and the University of Massachusetts, PhD students have been defunded months before their dissertations.[43]

A stay would exacerbate these harms, disrupting the careers of our brightest scholars and denying research institutions access to the funding they need to keep critical research programs online. The courts below correctly recognized these harms, App. 33a-35a, and the government is wrong to ignore them, *see* Gov. Br. 37-38.

B. The mechanisms for grant-based funding mean that sudden grant terminations will cost jobs and close laboratories, causing lasting damage to scientific progress.

Scientific research is particularly vulnerable to even brief lapses in funding. Research laboratories do not operate with profit margins—funds are drawn down as needed and cannot be reserved to cover gaps. Because grant applications take years to prepare, review, and fund, labs cannot quickly pivot when funding disappears. As a result, the termination of NIH grants will have devastating and permanent effects on established researchers, labs, and institutions. And there is often "'no way to recover the lost time, research continuity, or training value once disrupted,' because studies and researchers cannot be held in stasis." App. 32a (quoting plaintiffs'

---

[41] Jeff Robinson, *UTMB Researcher Says NIH Cuts Have Cost University Millions*, The Daily News: Galveston County (June 4, 2025), https://tinyurl.com/nhjta6ae.

[42] Rachel Nuwer, *U.S. Budget Cuts are Robbing Early-Career Scientists of Their Future*, Sci. Am. (July 3, 2025), https://tinyurl.com/2x46pkdn.

[43] Ellis Preston, *PhD Students Left 'Devastated' from Grant Money Uncertainties*, The State Press (Apr. 8, 2025), https://tinyurl.com/3r5jx427; Emilee Klein, *UMass Climate Scientists Reeling as Trump Administration Slashes Funding for Research*, Greenfield Recorder (June 23, 2025), https://tinyurl.com/5n862rtk.

declarations). This lasting damage to storied institutions and the important research they conduct is no mere monetary harm.

Today, NIH funds more than 50,000 competitive research grants for more than 300,000 researchers at more than 2,500 universities.[44] Scientists rely on NIH grants to acquire the infrastructure, personnel, equipment, and supplies needed to do cutting-edge experiments.[45] Organizations use grant funding to provide state-of-the-art lab space and support services.[46] And many faculty hold "soft money" roles that rely on external funds, requiring them to "forage for their own salary by finding grants."[47] The loss of federal funds thus creates a "human capital erosion loop"—in which "reduced funding for training and salaries drives researchers out of the field, decimates lab capacity, and reduces institutional viability."[48]

---

[44] Larry Luxner, *Rare Disease Researchers Warn NIH Budget Cuts Could Threaten Progress and Endanger Lives*, Rare Disease Advisor (Apr. 2, 2025), https://tinyurl.com/mrxffmef.

[45] *See* NIH Off. of Extramural Rsch., *NIH Grants Policy Statement: Section 7.3* (Apr. 2024), https://tinyurl.com/54cjrt3w (explaining that direct costs include salaries, travel, equipment, and supplies, and indirect costs include facilities and administrative costs).

[46] *See* NIH Off. of Extramural Rsch., *supra* note 45 (explaining that indirect costs include facilities and administrative costs).

[47] Heidi Ledford, *These US Labs Risk Imminent Closure After Trump Cuts*, Nature (Mar. 28, 2025), https://tinyurl.com/bdfrtnwm; Brady T. West, *A Michigan Research Professor Explains How NIH Funding Works – and What it Means to Suddenly Lose a Grant*, The Conversation (May 2, 2025), https://tinyurl.com/432j77we.

[48] *See* Global Biodefense Staff, *NIH Budget Cuts Threaten to Cripple U.S. Biomedical Innovation and Public Health*, Global Biodefense (July 28, 2025), https://tinyurl.com/28dmnuh4.

The sudden loss of NIH funding for a laboratory can be fatal to its experiments, because scientists cannot save grant money to prepare for gaps in federal funding.[49] Unlike grants in other fields, NIH grants are rarely issued as lump-sum awards.[50] Instead, scientists draw on their grant account on an as-needed, item-by-item basis.[51] If funds remain in the account when the relevant studies are concluded, they return to the government, so the scientist receives no profit.[52] While some grants have longer windows than others, researchers must continually apply for funds to keep their labs afloat.[53] And the grant application process has become increasingly competitive, with funding margins growing ever narrower.[54] Sudden grant cuts can thus be a death

---

[49] *See* 2 C.F.R. § 200.344 ("The recipient . . . must promptly refund any unobligated funds that the Federal agency . . . paid and that are not authorized to be retained.").

[50] *See* NIH Off. of Extramural Rsch., *NIH Grants Policy Statement: Section 5.3* (Apr. 2024), https://tinyurl.com/49kmu59h ("For most grants, NIH uses the project period system of funding. Under this system, projects are programmatically approved for support in their entirety but are funded in annual increments called budget periods.").

[51] *See* NIH Off. of Extramural Rsch., *supra* note 50 (explaining that grant recipients must "submit an annual progress report as a prerequisite to NIH approval and funding of each subsequent budget period").

[52] *See* NIH Off. of Extramural Rsch., *NIH Grants Policy Statement: Section 18.3.3* (Apr. 2024), https://tinyurl.com/35ev8zye ("Except for grants awarded under the SBIR/STR programs, under an NIH grant, no profit or feel will be provided[.]").

[53] Esther Choo, *I'm a Health Researcher. NIH's Pause on Research Grants Could Have a Devastating Cost.*, MSNBC (Jan. 24, 2025), https://tinyurl.com/48nfx27p ("Because any given grant only supports a small portion of a researcher's time for a few years, most must continuously pursue funding so that they and their teams can receive a full paycheck that doesn't abruptly disappear when a grant ends.").

[54] *See* Angus Chen, et al., *NIH is Shrinking the Number of Research Projects it Funds due to a New Trump Policy*, STAT+ (July 29, 2025), https://tinyurl.com/2m5tj7cw ("The policy change, affecting multiple branches of NIH, will ratchet up competition for grants to an unprecedented level."); Smriti Mallapaty, *Exclusive: NIH Grant Rejections Have More Than Doubled Amid Trump Chaos*, Nature (May 19, 2025), https://tinyurl.com/3bkvx7sk ("[NIH] has drastically increased the number of grant applications it has rejected without funding.").

knell for a laboratory. As a recent study published by the JAMA Health Network recounted, "[e]ven temporary disruptions in NIH funding have been shown to increase research personnel unemployment by 40% in single-grant laboratories and reduce their publication rates by 90%."[55]

Grant applications require time, diligent effort, and a volume of knowledge—so unanticipated cuts can set scientists back years. Before applying, researchers must gather preliminary data and survey the literature to validate their hypothesis.[56] That process can take a year or more depending on the researcher's background knowledge and the nature of the grant.[57] Once the scientist writes and submits their application, they undergo several rounds of review by the NIH, taking place over many months.[58] Grants are rarely funded on the first submission—applicants must address reviewer comments, conduct additional research, and resubmit in the next application cycle.[59] These steps add up quickly. Generally, meritorious proposals are funded two years after they are first drafted.[60] The sudden loss of grants like those at issue in this case will force scientists to start this process from scratch, their research languishing as

---

[55] Jalali & Hasgul, *supra* note 12 (citing Tham, et al., *supra* note 12).

[56] *See* West, *supra* note 47 (explaining the process of applying for an NIH grant).

[57] *See* West, *supra* note 47 ("On average, I would estimate that it takes about a year to craft a research proposal from scratch.").

[58] *See* NIH, *Grants Process: Review* (Aug. 16, 2024), https://tinyurl.com/ypsyvwc4; *see also* Harvard Univ., *NIH Grant Process* (last visited July 30, 2025), https://tinyurl.com/29953c6h (explaining that the peer review process takes 2-8 months after submission).

[59] *See* NIH, *NIH All About Grants Podcast: To Resubmit or Not* (Oct. 5, 2021), https://tinyurl.com/mesz3v4z ("In general, I almost always advise people to resubmit because it gives you a much higher probability of getting the application funded….").

[60] *See* West, *supra* note 47 ("[I]t generally takes about two years from the time you start writing a proposal to the time that you get funded.").

they scramble for funds.[61] And for new faculty or postdocs, who lack the runway necessary to apply a second time, these losses can be career-ending.[62]

There are no adequate alternatives to NIH funding for basic scientific research, meaning that projects halted following NIH grant terminations will likely be shuttered for good. "NIH is the largest single public funder of biomedical and behavioral research in the world."[63] Though private companies can "pick up strands of research that might have otherwise been funded by the federal government," their budgets "cannot remotely replicate the breadth, depth or public service provided by federal funding."[64] And there is "little commercial incentive for private enterprises to invest" in basic science, which generates "broad societal benefit[s]" but few immediate commercial dividends.[65] It follows that "[f]inding a funding source large enough to fill the void" created by the termination of these grants "will be almost impossible."[66]

---

[61] *See* Annie Waldman, et al., *Shattered Science: The Research Lost as Trump Targets NIH*, ProPublica (June 12, 2025), https://tinyurl.com/bdhtj64u ("[M]ore than 70 researchers [] said that they were unable to continue their projects due to the terminations.").

[62] *See* Nuwer, *supra* note 42 ("Senior researchers often have a diversity of funding streams, but for those starting out in the field, 'grants serve as the foundation for an entire career of work' . . . . With the cuts, 'there are some [early-career researchers] who we will undoubtedly lose from the scientific and health enterprises.'") (alteration in original); *see, e.g.*, Sara Reardon, et al., *U.S. Scientists' Lives and Careers Are Being Upended. Here are Five of Their Stories*, Science (May 2, 2025), https://tinyurl.com/2z2772hv.

[63] NIH, *supra* note 3.

[64] Jessica Glenza, *Private Firms are Trying to Fill Research Gaps, but Their 'Puny' Budgets are No Match for Federal Funds*, The Guardian (May 1, 2025), https://tinyurl.com/2hfsm4xj.

[65] Miller, *supra* note 2.

[66] Lloreda, *supra* note 37.

II. NIH support for biological and biomedical science is indispensable, and its loss will stall critical discoveries that are vital for innovation, knowledge, and human health.

The loss of NIH funds will also have downstream effects that stretch far beyond individual researchers and institutions. As NIH continues its grant terminations and shutters research projects, scientific and medical advancements will be delayed or abandoned—compromising health and endangering human lives. It is difficult to calculate precisely how damaging the loss of NIH research and transition grants will be. "Major advances in technology often are based on research whose eventual outcomes and applications could not have been predicted."[67] This damage is being felt now due to NIH's cuts and suspension of billions in federal funding for biomedical science.[68] And the damage to researchers, patients, and the nation's economy far outweighs any harm invoked by the government.

A. The termination of NIH grants will halt groundbreaking discoveries that have promising implications for health and longevity.

The NIH's grant terminations will "result in the setback of 'life-saving research by years if not decades'" by "eliminat[ing] funding for 'urgent public health issues.'" App. 33a. NIH-funded research has "unlocked important treatment advances for

---

[67] Nat'l Acad. of Scis., *Allocating Federal Funds for Science and Technology*, Nat'l Lib. of Med. (1995), https://tinyurl.com/msbbs277 ("[W]ork on atomic clocks led to the concept and development of [GPS] . . . ; work on the microwave spectrum of ammonia enabled the development of lasers; and studies of magnetic moments and nuclear spin were the basis for the development of magnetic resonance imaging and dramatic new forms of medical diagnosis.").

[68] *See* Megan Molteni, et al., *NIH Grants Plummeted $2.3 Billion in Trump's First Months, as Federal-Academia Partnership Crumbles*, STAT+ (Apr. 24, 2025), https://tinyurl.com/yefmxukm.

cardiovascular illness, cancer, infectious diseases, and mental health."[69] The resulting health benefits have no equal. NIH funding made possible the Human Genome Project, which launched a genomics industry that now generates more than $5.2 billion in annual revenue and sustains more than 850,000 jobs.[70] NIH-funded research into coronary heart disease has contributed to a 70% reduction in related deaths over 50 years.[71] Improvements in cancer detection and treatment have reduced the cancer death rate by 33% in just 30 years.[72] Immunology research has produced vaccines for diseases like polio, measles, and Hepatitis A.[73] And NIH funding has contributed to 354 of the 356 new pharmaceuticals approved in the last decade.[74]

The government's termination of NIH grants has already stalled that extraordinary engine of discovery. Roughly 90% of the grants cut these last months funded research and development projects, in addition to training and career development.[75]

---

[69] Miller, *supra* note 2.

[70] Simon Tripp & Martin Grueber, *The Economic Impact and Functional Applications of Human Genetics and Genomics*, Am. Soc'y of Hum. Genetics (May 2021), https://tinyurl.com/59h7rp69.

[71] Nat'l Heart, Lung & Blood Institute, *supra* note 4.

[72] Siegel, *supra* note 4.

[73] David A. Montero, et al., *Two Centuries of Vaccination: Historical and Conceptual Approach and Future Perspectives*, Frontiers in Pub. Health (Jan. 9, 2024), https://tinyurl.com/5bzcthn4.

[74] Ekaterina G. Cleary, et al., *Comparison of Research Spending on New Drug Approvals by the National Institutes of Health vs the Pharmaceutical Industry, 2010-2019*, JAMA Health F. (Apr. 28, 2023), https://tinyurl.com/46hntuzy; *see also* Bentley Univ., *New Study Shows NIH Investment in New Drug Approvals is Comparable to Investment by Pharmaceutical Industry* (Apr. 28, 2023), https://tinyurl.com/33mty937 ("[A]t least half of the total investment in research and development required to bring a product to market comes from the U.S. government.").

[75] Marcelo Jauregui-Volpe, *New Brief Finds NIH has Canceled $1.9 Billion in Grants*, Ass'n of Am. Univs. (May 9, 2025), https://tinyurl.com/33m8s8pm.

NIH has cut studies into HIV/AIDS,[76] maternal mortality,[77] youth suicide, and bone health.[78] It has defunded research projects exploring critical heart conditions.[79] It has ended more than 240 grants supporting cancer research.[80] The resulting damage to science will be difficult to reverse, and the health benefits of these promising initiatives may never be realized.

Other grant terminations underscore the type of vital breakthroughs that can be lost if the district court's order is stayed. For example, the rapidly growing field of aging and longevity research faces the loss of key research due to grant cancellations. NIH has terminated multiple studies addressing Alzheimer's and other chronic conditions that affect our aging population. Today, scientists are developing drugs "to treat the underlying causes of Alzheimer's rather than just slowing its symptoms."[81] But in March, NIH halted funding for 14 of 35 Alzheimer's Disease Research Centers.[82] Indeed, one postdoc applied for MOSAIC funding to research Alzheimer's, only

---

[76] Anil Oza, *NIH Cuts Halt 24-Year Program to Prevent HIV/AIDS in Adolescents and Young Adults*, STAT+ (Mar. 25, 2025), https://tinyurl.com/4xmufebw.

[77] Jason Mast, *Columbia Scientists Reel as Trump Administration Cancels Grants, Hitting Broad Suite of Research*, STAT+ (Mar. 11, 2025), https://tinyurl.com/4f9wv62s.

[78] Protect Our Care, *"It's A Bloodbath": Trump Administration Slashes Millions in NIH Funding for Maternal Health, HIV, and Other Research* (Mar. 26, 2025), https://tinyurl.com/bddzdr3u.

[79] *See, e.g.*, Meg Tirrell, *NIH Froze Funding for Clinical Trials at a Major University. By Fall, They'll Run Out of Funding*, Wral News (June 23, 2025), https://tinyurl.com/yeuhy6fh (explaining NIH cuts to atrial fibrillation research).

[80] Elisa Muyl & Anthony Lydgate, *How Trump Killed Cancer Research*, Wired (July 21, 2025), https://tinyurl.com/72e2j7a7.

[81] Sara Moniuszko, *How Trump Health Agency Cuts Could Impact Alzheimer's Research and Patients*, CBS News (Apr. 7, 2025), https://tinyurl.com/3vhu97m3.

[82] Jacqueline Howard, *Uncertainty Around NIH Funding Leaves Alzheimer's Studies in Limbo*, CNN (Apr. 24, 2025), https://tinyurl.com/fdah46r8.

for NIH to refuse to consider her grant application. D. Ct. Dkt. 38-21. These funding cuts will slow or even stop the ongoing progress toward cures for Alzheimer's disease and related conditions.[83] Here, too, an abrupt termination of NIH grants will threaten critical discoveries, with health impacts that stretch far beyond mere delay in the restoration of funds.

B. The loss of NIH funding has stalled ongoing clinical trials, curtailing innovative therapies and endangering patients.

This "abrupt cutoff in funding" will also "delay treatment for patients enrolled in 'clinical trials for life-saving medications or procedures.'" App. 31a-32a (quoting plaintiffs' declarations). Clinical trials are "at the heart of all medical advances."[84] They help scientists develop new ways to prevent, detect, and treat illnesses; discover the underlying biology of diseases; ensure the safety and efficacy of new medications; and reduce healthcare costs.[85] They give people hope, offering patients with terminal or debilitating illnesses new and unique opportunities to restore their quality of life.[86] And they yield novel research that "supports public health, drives medical discovery, and reduces the burden of disease and illness."[87] Today, NIH funds large-scale clinical

[83] Howard, *supra* note 82.

[84] NIH, *The Basics: What are Clinical Trials and Why Would I Want to Take Part?* (Apr. 24, 2025), https://tinyurl.com/33p79k83.

[85] Haofuzi Zhang, Xiaofan Jiang, *Importance of Clinical Trials and Contributions to Contemporary Medicine: Commentary*, Ann Med. (Jan. 9, 2025), https://tinyurl.com/55bs2kwm.

[86] *See* NIH, *supra* note 84 ("Clinical trials offer hope for many people and a chance to help researchers find better treatments for others in the future.").

[87] NIH, *Promotional Materials: "Why NIH Clinical Research Matters" PowerPoint Presentation* (Jan. 17, 2025), https://tinyurl.com/mpsbhj4p.

trials for cancer, allergies, infectious diseases, Alzheimer's and dementia, neurological disorders, and more.[88]

The government's termination of NIH grants has now shuttered many ongoing clinical trials, with irreversible impacts on patient health and medical innovation. *See* App. 32a. The harm from a stay in this case, combined with the effect of continued grant terminations, cannot be overstated. As of June 4, 2025, over 2,200 NIH grants have been terminated,[89] including at least 160 clinical trials addressing prominent conditions.[90] In March, NIH canceled "an ongoing 30-year, nationwide study tracking patients with prediabetes and diabetes."[91] In May, NIH cut a meticulously planned 600-person clinical trial designed to combat "America's devastating maternal mortality rate."[92] These clinical trials require months or years to plan, and more to execute. But the mass termination of NIH funding has ended them abruptly, compromising their results and leaving hundreds of participants in a state of uncertainty.[93]

The termination of these trials has deprived patients of potentially lifesaving treatments. In February, a 43-year-old mother with stage IV colorectal cancer was accepted into a clinical trial testing an experimental immunotherapy.[94] But that trial

---

[88] *See* NIH, *Finding a Clinical Trial* (Apr. 24, 2025), https://tinyurl.com/2yn4ezcr.

[89] Nietzel, *supra* note 10.

[90] AAMC, *Impact of NIH Grant Terminations* (May 27, 2025), https://tinyurl.com/3kn5x2h5.

[91] Elaine Chen, *NIH Cancels Funding for Landmark Diabetes Study at a Time of Focus on Chronic Disease*, STAT+ (Mar. 17, 2025), https://tinyurl.com/2sjdekbk.

[92] Mast, *supra* note 77.

[93] *See, e.g.*, Howard, *supra* note 82.

[94] Jacqueline Howard, *After NIH Staffing Cuts, Cancer Patient in Clinical Trial Worries She May Lose Crucial Time*, CNN Health (May 14, 2025), https://tinyurl.com/bdfcrb54.

has been delayed indefinitely due to cuts at NIH, which could cost the patient her life.[95] A 24-year-old mother battling stage IV B-cell lymphoma was scheduled to begin a potentially lifesaving clinical trial at NIH.[96] But as the trial date approached, she was told she could no longer take part due to NIH funding cuts.[97] Her trial was transferred to Canada.[98] And last month, a 56-year-old metastatic cancer patient's experimental cell therapy was delayed due to a loss of NIH funding.[99] These health impacts are immediate and ongoing. Each of these patients, and many more, could be denied chances to dramatically improve their health outcomes.

C. The loss of federal funding for scientific research will undermine our nation's economy and weaken our geopolitical leadership.

Grant terminations will also cause lasting "economic and non-economic harms . . . to the public at large, and to the scientific and medical advancements of the United States." App. 34a. The American scientific enterprise is "an engine of research and innovation that has thrummed for decades."[100] And NIH is "an economic powerhouse" that creates jobs, generates economic activity, and drives "innovation that supports America's global leadership."[101] The termination of NIH grants will not merely harm

---

[95] Howard, *supra* note 94.

[96] Aimee Cho, *Mom with Stage 4 Cancer Approved for Clinical Trial After NIH Funding Cuts Left Her in Limbo*, NBC Washington (Mar. 8, 2025), https://tinyurl.com/57aw9tpa.

[97] Cho, *supra* note 96.

[98] Cho, *supra* note 96.

[99] Carolyn Y. Johnson, *His Custom Cancer Therapy is in an NIH Freezer. He May Not Get it in Time.*, Wash. Post (June 18, 2025), https://tinyurl.com/2uardwms.

[100] Alan Burdick, *Trump vs. Science*, N.Y. Times (Apr. 25, 2025), https://tinyurl.com/6v6peawp.

[101] United for Med. Rsch., *supra* note 5, at 1.

scientists and institutions—it will stall that essential engine of progress, with ripple effects that irreparably harm entrepreneurs, businesses, and communities.

Today, "NIH is the largest single public funder of biomedical and behavioral research in the world."[102] In fiscal year 2024 alone, NIH's $36.94 billion in awards to researchers in the United States generated $94.58 billion in economic activity nationwide.[103] NIH funding supports 407,782 research positions and sustains a biomedical industry with 7 million jobs nationwide.[104] These investments power the American economy, "generat[ing] billions of dollars in wages, taxes, and increas[ing] the national GDP," a core indicator of economic health.[105] Indeed, "[d]iscoveries arising from NIH-funded research provide a foundation for the U.S. biomedical industry, which contributes over $69 billion to the U.S. GDP each year."[106] The loss of federal grant funding—even for a matter of months—stifles the fundamental research that keeps this engine running.

The abrupt termination of NIH funding has already harmed core industries—crippling our infrastructure and limiting our capacity to undertake future endeavors. NIH cuts have caused biotech investors to "retreat to safety."[107] Suppliers of scientific

---

[102] NIH, *supra* note 3 ("Each year, NIH awards over 60,000 grants that directly support more than 300,000 researchers at more than 2,500 different institutions.").

[103] Michael T. Nietzel, *NIH Grants Fueled $95 Billion in FY 2024 Economic Activity, Finds New Report*, Forbes (Mar. 12, 2025), https://tinyurl.com/47aara8u.

[104] Nietzel, *supra* note 103; NIH, *Spurring Economic Growth* (Apr. 18, 2025), https://tinyurl.com/bdcv4688.

[105] Sci. Coalition, *American-Made Innovation: Sparking Economic Growth* (2025), https://tinyurl.com/3mv63dyr.

[106] NIH, *supra* note 104.

[107] Yoana Cholteeva, *Cuts to FDA and NIH Will Hurt Health Tech Startups, Investors Warn*, Glob. Corp. Venturing (May 2, 2025), https://tinyurl.com/ux2psz33.

products have experienced falling revenue and expect losses in the months to come.[108] Leading medical technology company BD has seen "a freeze on capital purchases."[109] TXG, a leading provider of single cell, spatial, and in situ products and technologies, has lost business due to trends in the "academic end-market, especially in the U.S."[110] Several top biotech tools companies have seen sharp declines in their stock prices.[111] Scientific conferences, the heart of intellectual exchange, have been disrupted by the funding cuts and anticipate further "dramatic changes" this year.[112] And scientific buildings are emptying out.[113] In Boston, Massachusetts, there has been an 11% increase in vacant laboratory properties compared to this time last year.[114]

Pulling NIH funding for scientific research also risks endangering America's technological leadership, creating a void that our geopolitical rivals are eager to fill. Over the last 20 years, China "has narrowed the U.S. global lead," raising its contribution to global research and development from 5% to 22%, while America's has declined from 37% to 27%.[115] China has begun to outpace the U.S. on important metrics of scientific progress—including high-impact papers, contributions to *Nature*

---

[108] *See* Christine Ro, *The Economic Effects of Federal Cuts to US Science – in 24 Graphs*, Nature (June 25, 2025), https://tinyurl.com/23jx6kyk.

[109] Ro, *supra* note 108.

[110] Alex Philippidis, *StockWatch: NIH Indirect Cost Cuts Shake Tools Stocks*, GenEdge (Feb. 17, 2025), https://tinyurl.com/y2fba5sm.

[111] Philippidis, *supra* note 110.

[112] Ro, *supra* note 108.

[113] Ro, *supra* note 108.

[114] Ro, *supra* note 108 (citations omitted).

[115] Sci. & Techn. Action Comm., *China is a Determined and Formidable Competitor with the U.S. in Science & Technology* 1 (last visited July 30, 2025), https://tinyurl.com/bdhst4h6.

publications, and the total number of STEM PhDs matriculating each year.[116] A study published by the Massachusetts Institute for Technology recognizes "that America's position as the world's uncontested technology and innovation powerhouse has been steadily slipping."[117] Our government must maintain its support for the sciences if it wishes to "maintain our historic preeminence in science and technology."[118]

NIH's termination of grants is already accelerating this trend, causing a drain on American talent and leading promising researchers to seek careers overseas.[119] As *Nature* observed in a recent study, "US scientists submitted 32% more applications for jobs abroad between January and March 2025 than during the same period in 2024," with searches for foreign jobs increasing by 35%.[120] In response to this realignment in interests, scientific institutions in the European Union and China have begun accelerating their hiring and research investments.[121] The inverse is also true. Career transition grants such as MOSAIC were a key incentive for researchers from foreign countries to move to the United States and remain in our institutions.[122] But following NIH's termination of these scientific grants, "applications to US institutions

---

[116] Sci. & Techn. Action Comm., *supra* note 115, at 1.

[117] Rebecca Mandt, et al., *Federal R&D Funding: The Bedrock of National Innovation*, MIT Sci. Pol'y Rev. (Aug. 20, 2020), https://tinyurl.com/2s4brtye.

[118] Sci. & Techn. Action Comm., *supra* note 115, at 1.

[119] Laurie Udesky & Jack Leeming, *Exclusive: A Nature Analysis Signals the Beginnings of a US Science Brain Drain*, Nature (Apr. 22, 2025), https://tinyurl.com/3r6j8t95; Catherine Offord, *Overseas Universities See Opportunity in U.S. 'Brain Drain'*, Science Insider (Mar. 17, 2025), https://tinyurl.com/yew5dacj.

[120] Udesky & Leeming, *supra* note 119.

[121] *See* Offord, *supra* note 119; Udesky & Leeming, *supra* note 119.

[122] *See* Offord, *supra* note 119.

from researchers in Europe dropped by 41%."[123] America will no longer be the land of innovation and opportunity if this trend is allowed to continue.

CONCLUSION

Amici urge this Court to deny the stay application.

Dated: August 1, 2025

/s/ *Megan Barbero*

VENABLE LLP

MEGAN BARBERO
Counsel of Record
600 Massachusetts Ave. NW
Washington, DC 20001
Tel: (202) 344-4540
MBarbero@Venable.com

KYLE H. KERAGA
750 E. Pratt St.
Suite 900
Baltimore, MD 21202
KHKeraga@Venable.com

EMILY R. MARCY
1850 Towers Crescent Plaza
Suite 400
Tysons, VA 22182
ERMarcy@Venable.com

[123] Udesky & Leeming, *supra* note 119.