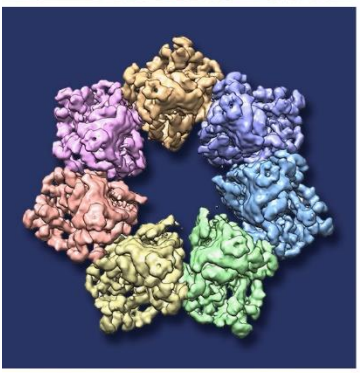

National Institute of Environmental Health Sciences

CONGRESSIONAL JUSTIFICATION
FY 2024

Department of Health and Human Services
National Institutes of Health

NIH National Institute of Environmental Health Sciences

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DEPARTMENT OF HEALTH AND HUMAN SERVICES

NATIONAL INSTITUTES OF HEALTH

National Institute of Environmental Health Sciences (NIEHS)

FY 2024 Budget Table of Contents

General Notes

1. FY 2023 Enacted levels cited in this document include the effects of the FY 2023 HIV/AIDS transfer, as shown in the Amounts Available for Obligation table.
2. Detail in this document may not sum to the subtotals and totals due to rounding.

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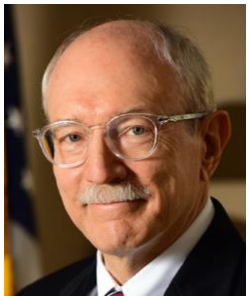
Director's Overview

Turning Discovery into Environmental Health

Mission

The mission of the National Institute of Environmental Health Sciences (NIEHS) is to discover how the environment affects people in order to promote healthier lives.


Richard Woychik, Ph.D.
Director, NIEHS

Collaborating on Climate Change and Health

Fulfilling our mission aligns with the breadth of NIH priorities. Our recently expanded efforts around the issue of climate change impacts on health help to illustrate this alignment. The urgency, enormity, and complexity of climate change requires that we marshal all our skills and capacities toward helping the global community understand, prepare, and respond to this threat. To this end, we enlisted a set of sister Institutes, Centers, and Offices (ICOs) to join with us in launching the NIH Climate Change and Health Initiative to help to guide NIH in its role as a global leader in promoting public health. This group developed a Strategic Framework for conducting transdisciplinary, transformative research in this area. Central to this research are four core goals:

1. Health Effects Research to tackle the undiscovered and identify the sources and extent of climate change threats to health;
2. Training and Capacity Building to inspire the next generation of scientists and provide them with the cutting-edge skills needed to meet this challenge;
3. Intervention Science to use the knowledge generated by Health Effects Research to develop targeted preventions and adaptations; and
4. Health Equity to ensure our efforts result in promoting health at all stages of life for all people, especially those most at risk from climate change.

Exploring the Exposome

While climate change looms, an interactive web of environmental exposures continues to contribute to persistent public health impacts like cancer, cardiovascular disease, asthma and other respiratory diseases, neurodevelopmental and neurodegenerative disorders, metabolic disorders and obesity, autoimmune dysfunction, and many more. To catalyze the study of the totality of a person's exposures over the course of their lifespan, we hosted a virtual workshop series, "Accelerating Precision Environmental Health: Demonstrating the Value of the Exposome" which brought together experts from multiple disciplines to explore how to advance this science.[1] This ambitious effort has the potential to spur advances across a spectrum of science, from measurement tools to biomarkers of exposure to data science and analytics to clinical and prevention trials that will enable significant progress against public health threats. A pilot study demonstrated the need to monitor individuals' exposures and integrate them with internal multi-omics profiles to characterize their responses to their personal environment.

[1] www.niehs.nih.gov/news/events/pastmtg/2022/exposomics2022/

Researchers annotated thousands of chemical and biological components of a person's external exposome and found that agrichemicals and fungi were predominant, and these exposures significantly correlated with internal biomolecules and pathways related to the individual's immune system, kidney, and liver.[2] Another study demonstrated how exposome data from individuals can be aggregated to help identify associations between risk factors and disease. Researchers conducted an exposome-wide association study that combined home and work exposures with health and medical histories from the North Carolina-based Personalized Environment and Genes Study (PEGS). They used machine learning to analyze the data for six cardiovascular outcomes and found novel associations including blood type A negative (Rh-) with heart attack, paint exposures with stroke, and biohazardous materials with arrhythmia, among others that can now be further explored as targets of prevention.[3]

Accessing Actionable Information

Along with exposomics, we continue to push the boundaries of science in areas including computational biology, data science, and mechanistic and translational toxicology, challenging our assumptions and expanding our approaches to generate the evidence base for prevention and cures. For example, a new data science tool, called quantvoe, will help researchers improve the reliability of studies that use observational data to generate associations, like poverty and diabetes. The tool can search among all (potentially thousands) variables in observational datasets and identify which associations are robust (high-confidence) versus non-robust (low-confidence), enabling researchers to correct for differences in hypothesis models, called "vibrations of effect," that can lead to contradictory results.[4] Other NIEHS efforts are working to take advantage of a potential wealth of environmental health discoveries presented by the integration of multiscale geospatial environmental data into population-level health studies. Connections being explored include, for example, air pollutant data from satellite remote sensing with blood pressure data from the NIEHS Sisters Study and geographic information system (GIS) mapping of drinking water wells with measurements of nearby residents' exposures to per- and polyfluoroalkyl substances (PFAS). Challenges include training scientists in terminologies and technologies to enable them to communicate and work across disciplines and generating data in ways that it can be combined to produce valid and reproducible results that decision makers can rely on.

Generating scientific evidence that regulators — and, more importantly, the public — can trust is a key role for NIEHS. Findings of our health effects research provide support for decisions that promote the public good, including the development by the Environmental Protection Agency (EPA) of a National Drinking Water Regulation for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS), and proposed designation of the two chemicals as hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund). Our PFAS research efforts continue to yield new insights, including an increased risk of liver cancer from exposure to high levels of PFOS[5] and an association between higher serum concentrations of PFOA and perfluorononanoic acid (PFNA) with reduced

[2] www.ncbi.nlm.nih.gov/pmc/articles/PMC9248886/
[3] pubmed.ncbi.nlm.nih.gov/35605674/
[4] www.ncbi.nlm.nih.gov/pmc/articles/PMC8510627/
[5] pubmed.ncbi.nlm.nih.gov/36111068/

fetal growth.[6] Findings are not limited to associations, however, but reach deep into the data to uncover the mechanisms by which these toxic chemicals cause harm to human systems, providing clues to how we might prevent or treat damage once exposure has occurred. A recent study illustrates how such mechanistic toxicology can pay off for public health. Researchers identified the means used by certain freshwater harmful algal blooms (HABs) to make guanitoxin, a potent neurotoxin that acts similarly to sarin. Understanding this process will allow scientists to improve environmental monitoring and better detect HABs before they present a threat.[7] Another way we are supporting the translation of mechanistic toxicology is through the Botanical Safety Consortium, a public-private partnership we convened with the Food and Drug Administration (FDA) and the non-profit Health and Environmental Science Institute (HESI). This effort will provide international scientists with a forum for generating scientifically-based assessments of the safety of botanical dietary ingredients by integrating existing safety data and toxicology tools for evaluation.[8] The consortium hosted its first Stakeholder Council webinar in early 2022 on the chemical safety of plant-based medicines.

Engaging Science in Environmental Justice

At NIEHS, we have long understood the importance of partnerships to the success of our endeavors and have relied particularly on communities and the public, as the ultimate beneficiaries of these efforts, to inform what we do and engage in how we do it. With the growing recognition of the role of health disparities in outcomes of exposure to everything from microplastics to pandemics, our strong history of work on environmental justice positions us well to maximize approaches that include consideration of social determinants of health. In North Carolina, 2.4 million people rely on private water wells, which are not protected by the Safe Drinking Water Act. A research team constructed NCWELL, a database of tests for toxic metals conducted in nearly 118,000 private wells in the state over 20 years. Analysis of NCWELL data, including geographic clustering, showed that some residents are exposed to arsenic and lead above EPA standards, raising environmental justice concerns. Use of these data can help to identify priority regions and populations for screening of wells and other public health interventions.[9]

A study of urban and rural communities in Alabama recently showed how using a community-engaged research approach can improve understanding of the environmental health priorities of people living in those areas.[10] The hazards of not including community participants in public eHealth efforts were presented in a paper on state-sponsored COVID-19 contact tracing mobile apps by members of a minority-serving community advisory board to the dissemination of the COVID Alert NY mobile app. Failure to access community viewpoints on the disease tracking app during development hindered equitable distribution, accessibility, and usage, and inadvertently contributed to widening digital health disparities.[11] Through research such as this, our understanding of integrating the full diversity of perspectives continues to grow. This past year, we created a new initiative to increase collaboration with historically black colleges and

[6] pubmed.ncbi.nlm.nih.gov/34735953/
[7] pubmed.ncbi.nlm.nih.gov/35583956/
[8] botanicalsafetyconsortium.org/
[9] pubmed.ncbi.nlm.nih.gov/34767890/
[10] pubmed.ncbi.nlm.nih.gov/34560866/
[11] pubmed.ncbi.nlm.nih.gov/35113793/

universities (HBCU). We are working with the HBCU Connect network to offer students and faculty at these institutions research training, hands-on laboratory experience, ongoing mentoring, and more opportunities to increase their representation in biomedical research.

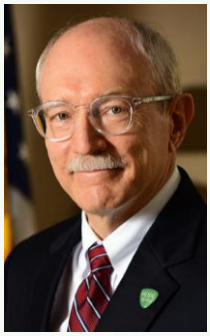
Conclusion

As challenges including climate change, global pandemics, and growing societal inequities threaten the health of individuals and communities both here and abroad, our mission at NIEHS has never been more relevant. We will continue to work tirelessly to expand and improve our science to create and translate knowledge that will ensure the health of all people.

National Institute of Environmental Health Sciences

Environmental Health Science for Everyone by Everyone

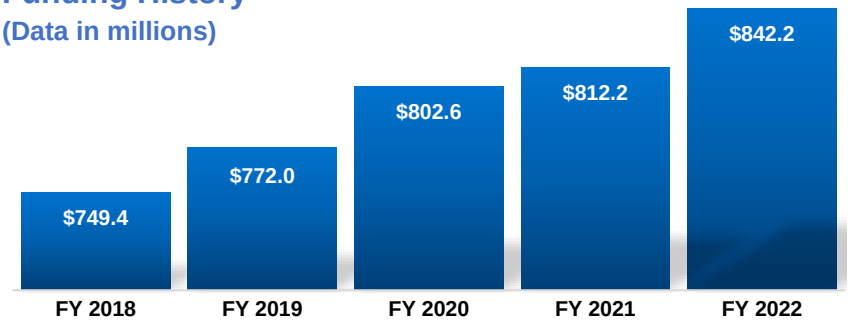
NIEHS science seeks to respond to the needs and concerns of the American people related to factors in the environment that can affect their health. Never has this mission been more relevant than now, as problems including climate change, global pandemics, and growing inequities threaten the health of individuals and communities. NIEHS brings a long history of leadership and partnership with affected communities and other stakeholders to fulfilling its mission. Ongoing efforts include understanding and addressing health disparities and environmental justice; unraveling the complex science of how the exposome and genetics combine to cause disease; building the evidence base for policies to improve and protect the nation's health, especially of those most at risk; and translating and disseminating environmental health knowledge to empower people in the United States and around the world to live healthier, more productive lives.



Director Richard P. Woychik, Ph.D., seeks to implement transformative science across the NIEHS enterprise, emphasizing the core values of Workforce Diversity, Innovation, Collaboration, Communication, and Distributive Leadership. A priority of his vision is to bring environmental health sciences to bear on solving complex problems, such as impacts of climate change on health and health disparities, by further integrating environmental health knowledge into programs across the NIH, as well as working with other federal partners and stakeholders.

Funding History

(Data in millions)



FY2023 Enacted: $913.8 million
FY2024 President's Budget: $938.8 million

Facts and Figures FY2018-FY2022

- 629 full-time FTEs (avg./yr.)
- 928 funded PIs (total FY2018-2022)
- 92 Early Stage Investigators (ESIs) funded (total FY2018-2022)
- 816 competing RPGs (total FY2018-2022)
- 15.4% Success rate (avg./yr.)
- 217 SBIR/STTR awards (43 awards avg./yr.)

Research Highlights

- A study of hospitalizations and high ambient temperatures showed that children and adolescents are particularly vulnerable to effects of extreme heat.
- Scientists develop 3-D structure of Twinkle protein involved in mitochondrial diseases that occur in 1 in 5,000 and cause effects such as hearing loss, liver failure, loss of muscle function, and neurological disorders.
- Levels of metals in pregnant women in Northeastern United States were significantly higher among Black and non-White Hispanic women, and in neighborhoods with higher crime and poverty and lower education and income.
- A systematic review found over 20 studies of environmental contaminants in menstrual products and recommends more research on potential risk to half the global population during their life course.
- A genetic algorithm called GADGETS is based on nuclear families and successfully detects epistasis, in which a gene mutation's effect, such as cleft palate, depends on mutations in one or more other genes.
- The Personalized Environment and Genes study found novel associations between paint chemicals and stroke.
- Researchers identified the genes used by some freshwater harmful algal blooms (HABs) to make guanitoxin, which will now allow for environmental monitoring of this potent neurotoxin.

National Institute of Environmental Health Sciences

Recent Accomplishments: Science in the Public Good


Leonard Zhukovsky / Shutterstock.com

Clean Buses, Cleaner Air
Urban air pollution from diesel-burning transit fleets is known to contribute to health problems including asthma and behavior issues in children and cognitive impacts in elderly residents. A study of air pollution following the transition of New York's Metropolitan Transit Authority bus fleet to cleaner technologies including natural gas, hybrid electric, and low-sulfur diesel showed a significant decrease in nitrogen oxide (NO), nitrogen dioxide (NO_2), and black carbon (BC), even in nearly 40 percent of areas without bus service.

Private Water and Public Health
In North Carolina, 2.4 million people rely on private wells for water. A research team constructed a database of tests for metals in nearly 118,000 private wells in North Carolina over 20 years. Analysis of the NCWELL data showed that some residents are exposed to arsenic and lead above EPA standards (10 and 15 parts per billion, respectively), and geographic clustering raises environmental justice concerns. NCWELL can be used to identify priority regions and populations for intervention and provide support for universal screening of private wells.

Tracking SARS-CoV-2 through the Sewers
Coalescing decades of expertise in wastewater surveillance and community engaged research has resulted in approaches to tracking COVID-19 that can provide population-level data in a timely way at a fraction of the cost of clinical testing. Monitoring of wastewater for SARS-CoV-2 on a group of 25 college campuses allowed officials to implement protective measures such as virtual-only classes without having to track individual students.

Current Activities

- Understanding our shared and individual exposomes is critical to protecting health. A series of workshops in 2022 explored all aspects of exposome science and an exposome community of practice is working to operationalize and integrate this knowledge into health and research programs, such as *All of Us,* to advance precision environmental health.
- HBCU-Connect is an initiative to strengthen ties between NIEHS and academic institutions that are often underrepresented in science. The program will provide students from Historically Black Colleges and Universities with more opportunities to be exposed to research settings and events, and also provide mentoring to encourage interest in careers in environmental health sciences.
- Efforts to ensure and promote healthy children include new Collaborative Centers in Children's Environmental Health and Translation; leadership of Subcommittees on Chemical Exposures and Climate, Emergencies, and Disasters of the President's Task Force on Environmental Health Risks and Safety Risks to Children; engagement on a range of activities to generate knowledge around healthy food and nutrition; and continuing research support for studies to understand the impacts of social determinants of health on children, including prenatal exposures to environmental chemicals.
- Environmental health research increasingly adds to the evidence base for clinical screenings for a variety of conditions and diseases through input to the United States Preventive Services Task Force.

Future Initiatives

NIEHS continually looks to build on the knowledge created by its science to reach for new understanding that will improve people's health and lives.

- The Institute has begun to develop a new Strategic Plan that will guide its efforts from 2024–2028. NIEHS will engage with a broad range of stakeholders to reflect on successes, explore research gaps and opportunities, and identify areas of focus, collaboration, and innovation with high potential to yield actionable scientific discovery. Issues of toxic exposures in air, water, and food remain ever-present. NIEHS will continue in its resolve and mission to improve health for all people.
- NIEHS will continue to invest in emerging research topics critical for advancing health including exposomics—the totality of a person's environmental exposures over their lifespan; mechanistic toxicology to describe how chemicals and other agents interact in the body; artificial intelligence and machine learning to predict harmful effects of exposures and diagnose disease; and integration of geoscience/geospatial technologies with population-level monitoring and surveillance data, electronic health records, and large-scale collection and repository efforts such as *All of Us*.
- As the COVID pandemic continues to evolve NIEHS will continue research on long-term impacts, particularly in relation to the social determinants that create wide health disparities and continue to challenge efforts towards health equity.
- With climate change an increasingly stark reality as more people face health threats from events such as extreme temperature and weather, NIEHS will continue to lead efforts to understand and respond to climate change effects on the health of individuals and communities around the world.

Major Changes in the Budget Request

Major changes by budget mechanism and/or budget activity are briefly described below. The FY 2024 President's Budget for NIEHS is $938.8 million, a $25.0 million increase from the FY 2023 Enacted level. The increase of $25.0 million expands research on the human health impacts of climate change.

Research Project Grants (-$0.2 million; total $302.6 million):
NIEHS plans to support a total of 583 RPG awards in FY 2024, excluding SBIR/STTR awards. Noncompeting RPGs will decrease by 5 awards and -$2.3 million while administrative supplements will increase by 15 awards and $4.3 million compared to the FY 2023 Enacted level. The number of competing RPG awards will decrease by 6 awards from FY 2023 Enacted levels while the amount allocated will decrease by $2.2 million. NIEHS will continue to support new investigators in FY 2024.

Other Research (+$8.7 million; total $54.1 million):
NIEHS plans to support a total of 127 grants in the area of Other Research in FY 2024. This is an increase of 1 award and $8.7 million compared to the FY 2023 Enacted level.

Intramural Research (+$6.5 million; total $263.8 million):
Intramural funding will increase by $6.5 million, or 2.5 percent, to cover expected pay and benefits increases for onboard intramural staff. The increase also supports continued, increased investment associated with research on human health impacts of climate change.

Research Management and Support (RMS) (+$2.9 million; total $42.4 million):
Funding for Research Management and Support will increase by $2.9 million, or 7.3 percent, to support management of funding for research on human health impacts of climate change.

NATIONAL INSTITUTES OF HEALTH

National Institute of Environmental Health Sciences

Budget Mechanism*

(Dollars in Thousands)

Mechanism	FY 2022 Final		FY 2023 Enacted		FY 2024 President's Budget		FY 2024 +/- FY 2023	
	Number	Amount	Number	Amount	Number	Amount	Number	Amount
Research Projects:								
Noncompeting	436	$209,714	443	$219,086	438	$216,771	-5	-$2,315
Administrative Supplements	*(43)*	$3,683	*(183)*	$15,665	*(198)*	$20,000	*(15)*	$4,335
Competing:								
Renewal	19	$9,645	12	$6,082	10	$5,220	-2	-$862
New	141	$62,388	139	$61,971	135	$60,617	-4	-$1,354
Supplements	0	$0	0	$0	0	$0	0	$0
Subtotal, Competing	**160**	**$72,033**	**151**	**$68,053**	**145**	**$65,838**	**-6**	**-$2,215**
Subtotal, RPGs	596	$285,430	594	$302,804	583	$302,609	-11	-$195
SBIR/STTR	40	$20,632	44	$22,603	44	$23,165	0	$562
Research Project Grants	636	$306,062	638	$325,407	627	$325,774	-11	$367
Research Centers								
Specialized/Comprehensive	24	$39,177	34	$54,858	39	$62,661	5	$7,803
Clinical Research	0	$0	0	$0	0	$0	0	$0
Biotechnology	0	$0	0	$0	0	$0	0	$0
Comparative Medicine	0	$0	0	$0	0	$0	0	$0
Research Centers in Minority Institutions	0	$0	0	$0	0	$0	0	$0
Research Centers	**24**	**$39,177**	**34**	**$54,858**	**39**	**$62,661**	**5**	**$7,803**
Other Research:								
Research Careers	51	$7,975	51	$7,861	52	$8,256	1	$395
Cancer Education	0	$0	0	$0	0	$0	0	$0
Cooperative Clinical Research	0	$0	0	$0	0	$0	0	$0
Biomedical Research Support	0	$0	0	$0	0	$0	0	$0
Minority Biomedical Research Support	0	$390	0	$385	0	$385	0	$0
Other	63	$24,410	75	$37,169	75	$45,484	0	$8,315
Other Research	**114**	**$32,775**	**126**	**$45,415**	**127**	**$54,125**	**1**	**$8,710**
Total Research Grants	774	$378,013	798	$425,680	793	$442,559	-5	$16,879
Ruth L Kirschstein Training Awards:	FTTPs		FTTPs		FTTPs		FTTPs	
Individual Awards	52	$2,406	62	$2,818	62	$2,891	0	$73
Institutional Awards	392	$21,276	425	$23,057	425	$23,640	0	$584
Total Research Training	**444**	**$23,682**	**487**	**$25,875**	**487**	**$26,531**	**0**	**$656**
Research & Develop. Contracts	72	$163,938	76	$165,413	75	$163,528	-1	-$1,885
SBIR/STTR (non-add)	*(0)*	*($239)*	*(0)*	*($251)*	*(0)*	*($257)*	*(0)*	*($6)*
Intramural Research	499	$242,269	524	$257,319	524	$263,795	0	$6,476
Res. Management & Support	139	$34,260	161	$39,520	161	$42,394	0	$2,874
SBIR Admin. (non-add)		*($229)*		*($256)*		*($274)*		*($18)*
Construction		$0		$0		$0		$0
Buildings and Facilities		$0		$0		$0		$0
Total, NIEHS	**638**	**$842,162**	**685**	**$913,807**	**685**	**$938,807**	**0**	**$25,000**

* All items in italics and brackets are non-add entries.

NATIONAL INSTITUTES OF HEALTH

NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES

For carrying out section 301 and title IV of the PHS Act with respect to environmental health sciences, **[**$913,979,000**]***$938,807,000*.

NATIONAL INSTITUTES OF HEALTH
National Institute of Environmental Health Sciences

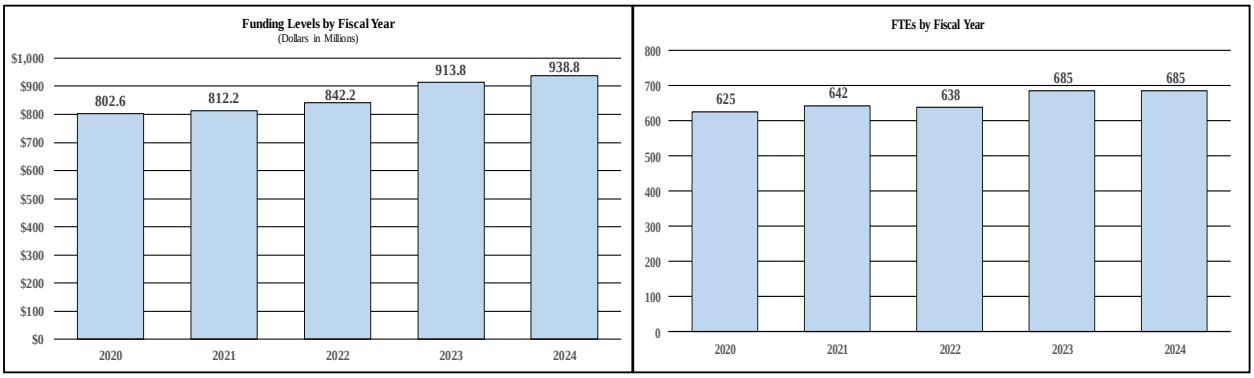
Summary of Changes
(Dollars in Thousands)

FY 2023 Enacted	$913,807
FY 2024 President's Budget	$938,807
Net change	$25,000

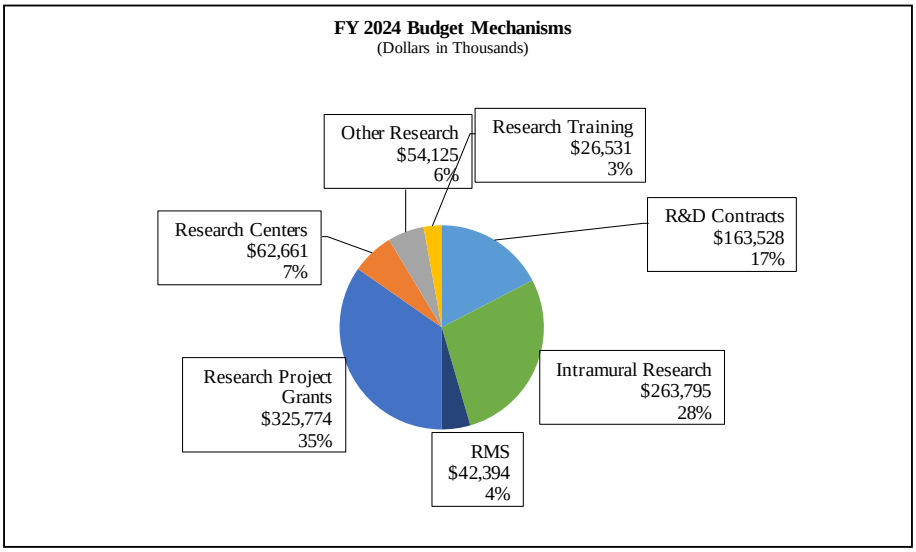
CHANGES	FY 2023 Enacted FTEs	FY 2023 Enacted Budget Authority	FY 2024 President's Budget FTEs	FY 2024 President's Budget Budget Authority	Built-In Change from FY 2023 Enacted FTEs	Built-In Change from FY 2023 Enacted Budget Authority
A. Built-in:						
1. Intramural Research:						
a. Annualization of FY 2023 pay and benefits increase		$99,496		$104,812		$1,102
b. FY 2024 pay and benefits increase		$99,496		$104,812		$3,811
c. Paid days adjustment		$99,496		$104,812		$383
d. Differences attributable to change in FTE		$99,496		$104,812		$0
e. Payment for centrally furnished services		$30,160		$30,643		$483
f. Cost of laboratory supplies, materials, other expenses, and non-recurring costs		$127,662		$128,340		$2,660
Subtotal						$8,439
2. Research Management and Support:						
a. Annualization of FY 2023 pay and benefits increase		$22,876		$24,097		$253
b. FY 2024 pay and benefits increase		$22,876		$24,097		$875
c. Paid days adjustment		$22,876		$24,097		$88
d. Differences attributable to change in FTE		$22,876		$24,097		$0
e. Payment for centrally furnished services		$2,347		$2,385		$38
f. Cost of laboratory supplies, materials, other expenses, and non-recurring costs		$14,297		$15,912		$311
Subtotal						$1,565
Subtotal, Built-in						$10,004

CHANGES	FY 2023 Enacted No.	FY 2023 Enacted Amount	FY 2024 President's Budget No.	FY 2024 President's Budget Amount	Program Change from FY 2023 Enacted No.	Program Change from FY 2023 Enacted Amount
B. Program:						
1. Research Project Grants:						
a. Noncompeting	443	$234,751	438	$236,771	-5	$2,020
b. Competing	151	$68,053	145	$65,838	-6	-$2,215
c. SBIR/STTR	44	$22,603	44	$23,165	0	$562
Subtotal, RPGs	638	$325,407	627	$325,774	-11	$367
2. Research Centers	34	$54,858	39	$62,661	5	$7,803
3. Other Research	126	$45,415	127	$54,125	1	$8,710
4. Research Training	487	$25,875	487	$26,531	0	$656
5. Research and development contracts	76	$165,413	75	$163,528	-1	-$1,885
Subtotal, Extramural		$616,968		$632,618		$15,650
6. Intramural Research	524	$257,319	524	$263,795	0	-$1,963
7. Research Management and Support	161	$39,520	161	$42,394	0	$1,309
8. Construction		$0		$0		$0
9. Buildings and Facilities		$0		$0		$0
Subtotal, Program	685	$913,807	685	$938,807	0	$14,996
Total built-in and program changes						$25,000

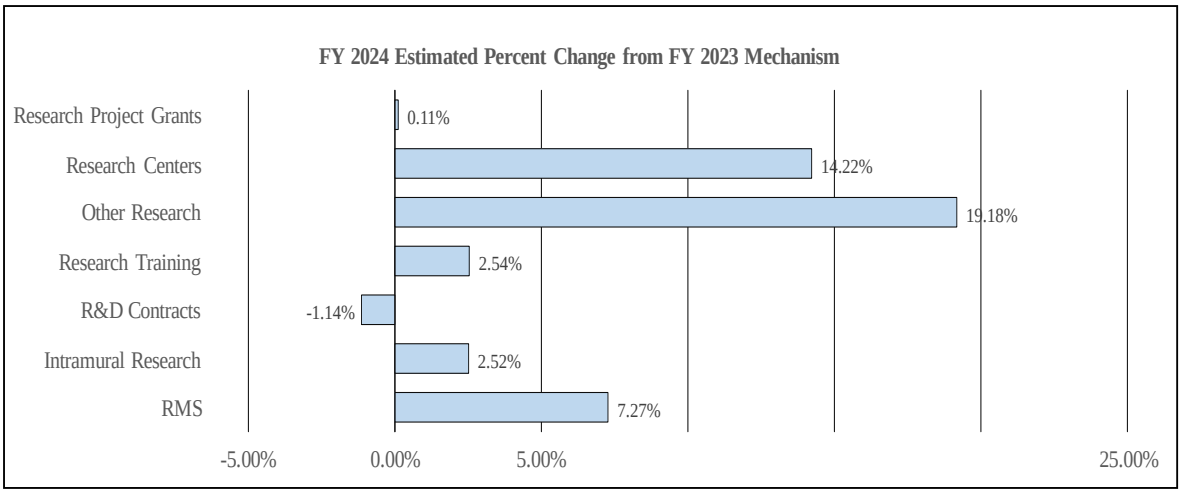
History of Budget Authority and FTEs:

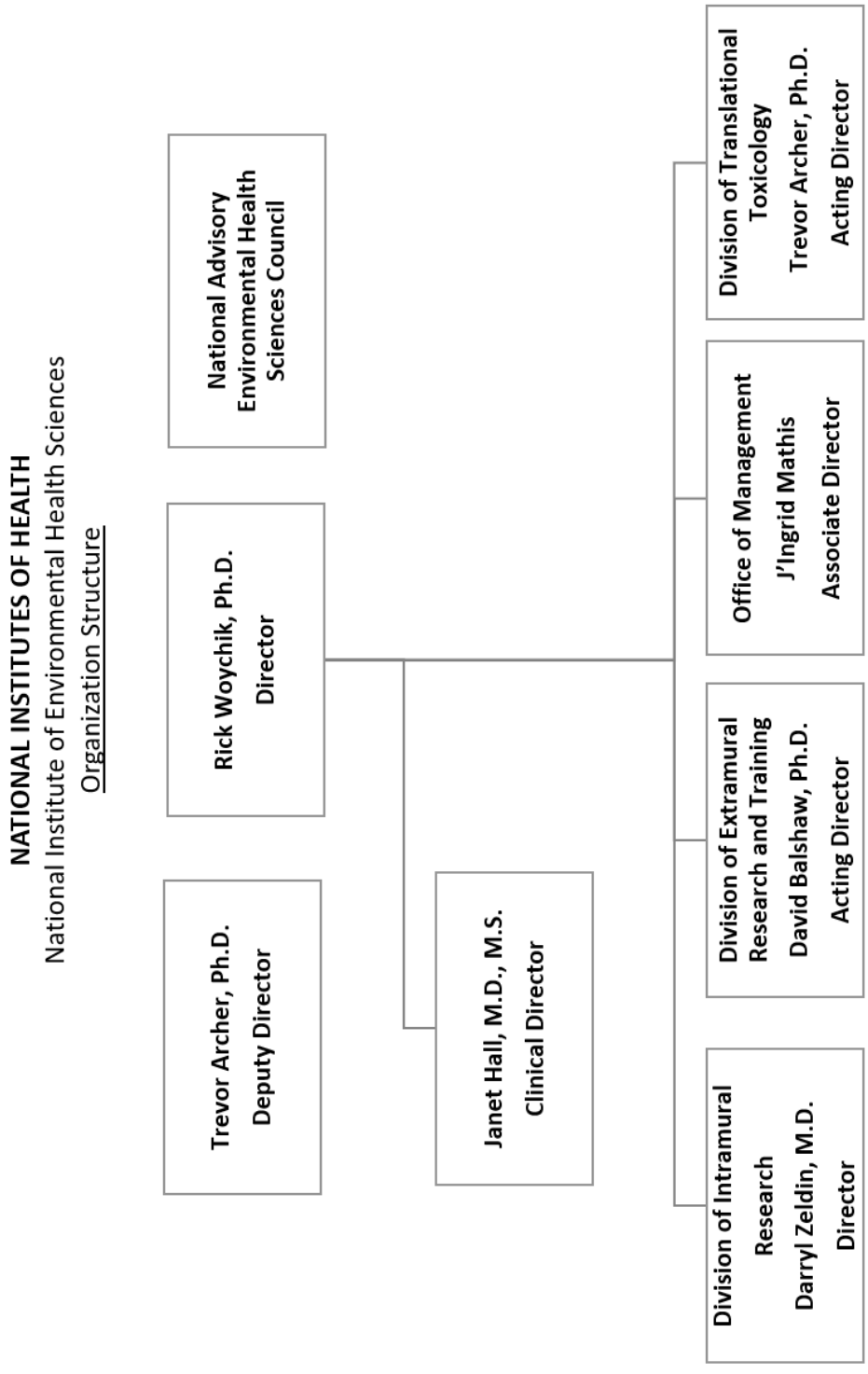


Distribution by Mechanism:



Change by Selected Mechanisms:




NATIONAL INSTITUTES OF HEALTH
National Institute of Environmental Health Sciences
Organization Structure
National Advisory Environmental Health Sciences Council
Rick Woychik, Ph.D.
Director
Trevor Archer, Ph.D.
Deputy Director
Janet Hall, M.D., M.S.
Clinical Director
Division of Translational Toxicology
Trevor Archer, Ph.D.
Acting Director
Office of Management
J'Ingrid Mathis
Associate Director
Division of Extramural Research and Training
David Balshaw, Ph.D.
Acting Director
Division of Intramural Research
Darryl Zeldin, M.D.
Director

NATIONAL INSTITUTES OF HEALTH
National Institute of Environmental Health Sciences

Budget Authority by Activity *
(Dollars in Thousands)

	FY 2022 Final		FY 2023 Enacted		FY 2024 President's Budget		FY 2024 +/- FY 2023 Enacted	
Extramural Research	**FTE**	**Amount**	**FTE**	**Amount**	**FTE**	**Amount**	**FTE**	**Amount**
Detail								
Fundamental Research		$207,273		$216,075		$220,157		$4,081
Exposure Research		$131,469		$149,210		$155,459		$6,249
Translational Research and Special Populations		$100,730		$115,420		$118,786		$3,365
Predictive Toxicology		$89,191		$91,671		$91,707		$36
Training and Education		$36,970		$44,592		$46,510		$1,918
Subtotal, Extramural		**$565,633**		**$616,968**		**$632,618**		**$15,650**
Intramural Research	**499**	**$242,269**	**524**	**$257,319**	**524**	**$263,795**	**0**	**$6,476**
Research Management & Support	**139**	**$34,260**	**161**	**$39,520**	**161**	**$42,394**	**0**	**$2,874**
TOTAL	**638**	**$842,162**	**685**	**$913,807**	**685**	**$938,807**	**0**	**$25,000**

* Includes FTEs whose payroll obligations are supported by the NIH Common Fund.

National Institute of Environmental Health Sciences

Authorizing Legislation: Section 301 and title IV of the Public Health Services Act, as amended

Budget Authority (BA):

	FY 2022 Final	FY 2023 Enacted	FY 2024 President's Budget	FY 2024 +/- FY 2023
BA	$842,162,000	$913,807,000	$938,807,000	+$25,000,000
FTE	638	685	685	0

Program funds are allocated as follows: Competitive Grants/Cooperative Agreements; Contracts; Direct Federal/Intramural and Other.

Overall Budget Policy: The FY 2024 President's Budget request for NIEHS is $938.8 million, an increase of $25.0 million or 2.7 percent compared with the FY 2023 Enacted level. The increase expands research on the human health impacts of climate change.

Program Descriptions

Fundamental Research

Fundamental research is a primary scientific emphasis of NIEHS. Investments in this area are aimed at tackling the undiscovered by identifying and understanding basic shared mechanisms or common biological pathways that underlie diseases and disorders, such as inflammation, genetic and epigenetic changes, oxidative stress, and mutagenesis. Knowledge of these fundamental processes enables the development of targeted prevention and treatment strategies at the individual level.

Scientific assays are a fundamental tool in the use of precision medicine in the fight against cancer as they help identify toxic exposures and show how those exposures act in the body, such as by causing genetic mutations. The NIEHS/National Cancer Institute Genome Integrity Consortium is leading the way in developing innovative assays that can predict individual risk of lung cancer from tobacco smoke exposure. These scientists have created assays that are more accurate and faster than other methods. A study using these

new assays identified mutations among smokers that can lead to increased cancer with age.[12] The study also showed that selection for mutation avoidance varies by individual.

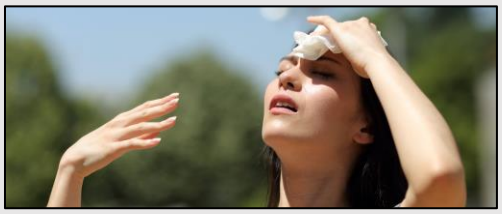
A collaboration including NIEHS scientists recently uncovered a fundamental mechanism by which senescent cells develop. Senescent cells are ones that have lost the ability to divide. Such cells accumulate with age and are key drivers of age-related diseases, such as cancer, dementia, and cardiovascular disease. Senescent cells secrete chemicals that promote inflammation and damage neighboring cells. A study by the collaboration showed, for the first time, that a specific kind of oxidative damage to telomeres—the protective tips of chromosomes—can trigger cells to become senescent.[13] Oxidative damage can result from environmental exposures such as sunlight, alcohol, smoking, and poor diet. Researchers hope these findings will eventually lead to targeted therapeutics that promote healthy aging or combat cancer.

Breathing is fundamental to life and the quality of the air people breathe has an enormous impact on a wide range of body systems and functions. Air pollution is thus among the most critical environmental and public health concerns worldwide. Nitrogen dioxide (NO_2) is one air pollutant of concern—breathing air with a high concentration of NO_2 over long periods can contribute to the development of asthma and increase susceptibility to respiratory infections. Effects of breathing NO_2 at low levels are less clear. NIEHS-funded researchers, in a study of a large and representative cohort, found evidence that long-term exposure to NO_2, even below national and global ambient air quality

[12] pubmed.ncbi.nlm.nih.gov/35410377/
[13] pubmed.ncbi.nlm.nih.gov/35773409/

Climate Change and Health

In the face of a changing climate and threats it poses, NIEHS is bringing leadership to ensuring health at all stages of life for all people. NIEHS leads and coordinates the NIH-Wide Climate Change and Health Initiative, including an Intramural Targeted Climate Change and Health Program. Equally important though is the deep expertise the Institute brings to this critical global issue from decades of research on the impacts of factors in the environment on health. Such research is helping to uncover the myriad ways in which changes in climate are fundamentally changing the systems humans rely on for air, water, food, work, and other essentials, and the resulting outcomes for health and life.



A study that looked at 33.6 million United States death records from 1988 to 2018 in light of the occurrence of hurricanes and tropical cyclones during the same period found a 33.4 percent increase in deaths from causes including injuries, respiratory diseases, cardiovascular diseases, infectious and parasitic diseases, and neuropsychiatric disorders in the months following these climate events. During the study period, over half of the United States population experienced at least one tropical cyclone, with a larger proportion of affected people living in historically disadvantaged communities. Severe storms are not the only climate change threat. A study of 1.5 million deaths in California found that on days where extreme heat and extreme air pollution combined, deaths were 21 percent more likely than on days of extreme heat (6.1 percent) or extreme air pollution (5 percent) alone. Other research is demonstrating how societal factors may exacerbate the potential for harm from climate change. A survey of African-American residents of Alabama found a 13 percent decline in their likelihood of using cooling centers in summer 2020 from previous summers, which the authors posit may result from safety concerns amid the COVID-19 pandemic and fears around police brutality in public spaces.

Other work is aimed at improving technologies to enable prevention of climate change related exposures. Researchers have identified the genes and pathways used by certain blue-green algae to make the potent neurotoxin guanitoxin, which acts the same as sarin. This new information will be used to create molecular tools for diagnosing these increasingly frequent harmful algal blooms in lakes and rivers.

guidelines, was associated with a higher risk of mortality among older adults.[14]

Budget Policy: The FY 2024 President's Budget request for Fundamental Research is $220.2 million, an increase of $4.1 million or 1.9 percent compared to the FY 2023 Enacted level.

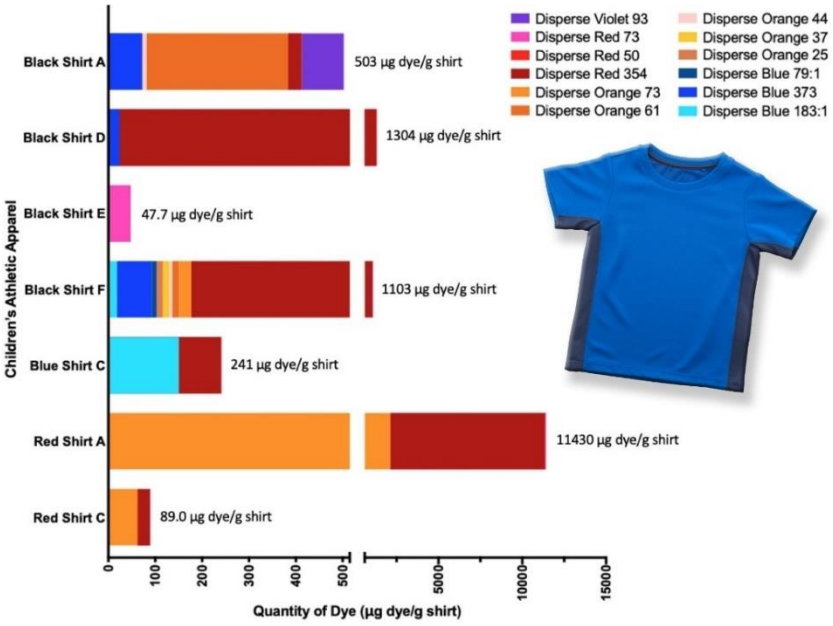
Exposure Research

Research in this program focuses on identifying and studying the exposome—the totality of exposures experienced over an individual's lifespan—and how those exposures affect health. Exposures to mixtures of chemical and non-chemical stressors including environmental pollution, diet, extreme events, as well as social determinants of health impact the biological systems within the body. Exposure research focuses on improving methods of detecting and measuring exposures in humans and other model organisms using state of the art collection technologies such as personal exposure sensors and geospatial tools, and applying advanced statistical, informatics, and analytical approaches to mining such data for insights that can inform prevention and improve health.

Exposure research is providing new understanding of effects of air pollutants on children, beginning during prenatal development. Researchers measured prenatal exposure to polycyclic aromatic hydrocarbons (PAHs) from traffic pollution and maternal stress. They reported for the first time that infants with higher levels of these exposures at four months of age exhibited measures of reactivity and self-regulation predictive of lower competence and behavioral problems at 12 months. In another study of traffic-related air pollutants (TRAP), researchers compared exposures of children aged 6-8 who were mostly male, Latinx, and low-income, with biomarkers of risk for adult metabolic and cardiovascular disease. Longer-term TRAP exposures were associated with increases in the children's hemoglobin A1c (HbA1c), systolic blood pressure (SBP), and urinary 8-isoprostane. These findings suggest that reducing childhood exposure to air pollution may help to modify risk of disease later in life.

[14] pubmed.ncbi.nlm.nih.gov/34962424/

An estimated 17 million Americans live within 1 mile of an active oil or gas well. A study compared historically redlined neighborhoods that experienced deliberate racial discrimination by the federal Home Owners' Loan Corporation (HOLC) with density of oil and gas wells.[15] Such wells create air, water, and noise pollution among other stressors and exposure to them increases the risk of cardiovascular disease, impaired lung function and fetal growth, anxiety, depression, and preterm birth. The study found wells in redlined areas at twice the density of non-marginalized neighborhoods, further demonstrating how past social policies have helped to create current health disparities.



Quantitative results for purified dyes in each shirt extract. All values are reported in µg dye/g shirt.

An innovative study of the potential for exposure to fabric dyes is laying important groundwork for standards to protect health.[16] Azobenzene (also called azo) dyes are the fastest growing class of dyes for coloring synthetic fabrics such as polyester, nylon, and acrylic. Chemicals in azo dyes are known to have allergenic and mutagenic effects. Because they are not chemically bound to fabrics, azo dyes may have the potential to migrate into people through skin contact, inhalation, or ingestion. Researchers used advanced analytical techniques to identify the likely chemical formulas of 19 azo dyes used in children's polyester athletic clothing. These data were then used to create reference standards and a mass spectral library to inform future research and improve understanding of the potential for harm from exposure to these ubiquitous chemicals.

Budget Policy: The FY 2024 President's Budget request for Exposure Research is $155.5 million, an increase of $6.2 million or 4.2 percent compared to the FY 2023 Enacted level.

<u>Translational Research and Special Populations</u>

This program includes a wide range of research activities that encourage the translation of clinical, population, and community-based science into improved public health practice and disease prevention strategies. Research investments focus on understanding environmental exposures to health disparate and other at-risk populations across life stages, in real-world settings, and in the context of social determinants of health. Knowledge generated by this research is used to promote the public good through policies and practices that improve health and increase health and social equity.

[15] pubmed.ncbi.nlm.nih.gov/35418707/
[16] https://pubmed.ncbi.nlm.nih.gov/34023658/

A study of levels of metals in a multiethnic cohort of pregnant women in the Northeastern United States demonstrates the unequal environmental burdens often borne by historically disadvantaged, and often under-studied, communities. The study found significantly higher levels of cadmium, chromium, lead, and antimony among Black and non-White Hispanic women, as well as in neighborhoods with higher crime and poverty and lower education and income.[17]

Other studies are evaluating the effects of chronic environmental exposures in populations at later life stages. Researchers in the Ginkgo Evaluation of Memory Study compared participant diagnoses with models that recreated their residential exposure to fine particulate matter ($PM_{2.5}$, a component of air pollution defined as tiny particles in the air that measure 2.5 microns or less in size; they arise primarily from combustion.) Results showed that long-term (20 years) exposure resulted in a 20 percent higher risk of all-cause dementia.[18] In a separate study (the Women's Health Initiative Memory Study), researchers hypothesized the neurotoxic effect of particulates could be occurring through a mechanism that could be ameliorated by high intake of B vitamins (folate, B_{12}, and B_6). Investigators found that residing in areas with elevated levels of $PM_{2.5}$ was associated (as expected) with a higher risk of all-cause dementia -- but only among participants with lower intake of B vitamins. These results suggest that such vitamins might be taken to modify neurotoxic effects of air pollution.[19]

NIEHS research interests extend across the exposome -- a person's cumulative exposures over their life span – including psychosocial stress, which can lead to various mental and physical consequences. Environmental disasters, pandemics, violence, and similar events all contribute to psychosocial or toxic stress. Researchers have proposed a framework for gauging the totality of such traumatic exposures using allostatic load (AL), a measure of the cumulative burden of chronic stress and stress from life events.[20] The framework combines indices of psychosocial and physiological AL to produce an overall estimate, which could be used as one component in a disaster-oriented human health observing system. Another study demonstrates how such measures might be combined with other types of data to predict long-term health effects. Researchers examined the length of telomeres of participants in the Sister Study, who had also reported their experience of 20 types of trauma. Shortened telomere length is a biomarker of cell aging and has been associated with multiple disease endpoints. After adjusting for age and childhood socioeconomics, high early life trauma was associated with shorter telomere length.[21]

[17] pubmed.ncbi.nlm.nih.gov/35065119/
[18] pubmed.ncbi.nlm.nih.gov/35436383/
[19] pubmed.ncbi.nlm.nih.gov/35103387/
[20] www.ncbi.nlm.nih.gov/pmc/articles/PMC8919761/
[21] doi.org/10.1016/j.psyneuen.2022.105876

Budget Policy: The FY 2024 President's Budget request for Translational Research and Special Populations is $118.8 million, an increase of $3.4 million or 2.9 percent compared to the FY 2023 Enacted level.

Predictive Toxicology

NIEHS works to develop and apply improved test methods and toxicity models that can be used to predict risk of cancer and other health outcomes resulting from environmental exposures. Predictive toxicology efforts include assessing the hazards of chemical mixtures, modeling non-chemical stressors that create health disparities, evaluating broad classes of chemicals efficiently, and identifying early biomarkers of health effects. This research is supported by innovative approaches to literature-based and integrative informatics, high throughput and computational modeling, and efforts to build scientific and regulatory confidence in new classes of data.

The Division of Translational Toxicology (DTT) conducts predictive toxicology in support the National Toxicology Program (NTP), which is headquartered at the NIEHS and works to develop more efficient and cost-effective ways to predict hazards from environmental exposures. A major current focus of the DTT is perfluoroalkyl and polyfluoroalkyl substances, known as PFAS. These chemicals are used in hundreds of consumer and industrial products, and are indicated to be present in the blood of 97 percent of Americans. PFAS exposure is associated with altered metabolism and increased risk of obesity, effects on fertility, reduced fetal growth, risk of certain cancers, and impaired ability to fight infections. More than 9,000 PFAS have been identified, making evaluation of the potential health hazards of each chemical individually an impossible task. DTT scientists are using high throughput systems to analyze sets of PFAS from the same class at once to speed understanding of their impacts in the body. In one study, researchers exposed spheroid groups of liver cells to four types of PFAS and looked for similarities in gene expression and biological response. Results indicated all four had common molecular targets and toxicities, indicating that this testing strategy can be used to provide a baseline for comparison with other known PFAS.[22]

[22] pubmed.ncbi.nlm.nih.gov/33772556/

Researchers in another study also used a high throughput system to screen for effects of 42 unique PFAS in a human placental cell line. Pregnant women require higher daily intake of water, which may increase their exposure to contaminants. Changes in cell function and gene expression observed in the study indicate that PFAS may directly target the placenta and disrupt placental cells at levels well below current toxicity thresholds.[23] Other NIEHS scientists are exploiting human-mouse similarities in placental development for model systems. To facilitate this research, a new comprehensive atlas of macroscopic and microscopic images of both normal and abnormal mouse placental development has been developed that will give researchers data for critical comparisons to study tissues across a wide variety of environmental exposures.

Another new tool will address a need for mining complex toxicology data. Dextr is an online tool that uses advanced machine learning to extract multiple concepts and elements from published literature for systematic review, with similar results as extraction by experts but at a much faster rate. Tools like Dextr will enable faster discoveries across broader swaths of data, decreasing the time of knowledge translation into prevention and cures.

Budget Policy: The FY 2024 President's Budget request for Predictive Toxicology is $91.7 million, an increase of $36,000 from the FY 2023 Enacted level.

Training and Education

NIEHS seeks to inspire the next generation of environmental health scientists by providing state-of-the-science training that will enable them to solve complex and emerging environmental health problems. Opportunities include lab-based training at the

[23] www.ncbi.nlm.nih.gov/pmc/articles/PMC9081605/

Advancing Progress on Parkinson's Disease

More than 1 million people in the United States are living with Parkinson's Disease (PD) and this number is steadily increasing, along with both economic and human costs. NIH research is advancing understanding of PD to enable treatments and progress toward a cure. Studies using 3-D cell culture models are revealing how environmental exposures interact with genetics to cause PD. For example, researchers developed a single-cell genetic sensor called PRISM that exploits the abilities of viruses to enter cells and cause DNA damage and used it to probe brain cells in mice exposed to the chemical paraquat, which has been strongly associated with PD. The sensor found evidence of high levels of genotoxic stress in dopaminergic neurons, the most affected cells in PD. This same team is working to unravel the protective mechanisms of caffeine and coffee consumption against PD. Researchers working in the Parkinson's Disease, Environment, and Genes (PEG) study measured the accumulation of mutations across the genes of individual patients and found associations between a high epigenetic mutation load and risk of PD, disease progression, and time to death.

Efforts are also focused on approaches for detecting PD earlier, which is key to delaying significant effects of the disease. NIH scientists found that supercharging certain cells in the brains of healthy and PD mice caused these neurons to generate dopamine metabolites at levels where differences were detectable in blood well before symptoms would normally appear, indicating which mice would develop the disease. The researchers are working to validate the findings in human studies.

Gastrointestinal dysfunction is a major symptom leading up to PD. A major focus of study has been signaling of the gut-brain axis. Using cell and animal models, researchers explored effects of exposure of certain GI cells to rotenone and tebufenpyrad, pesticides that induce death in dopaminergic neurons. The study demonstrated for the first time that such exposure worked similarly in the gut to impair the mitochondrial functions of enteric glial cells and induce inflammation leading to gut dysfunction. Yet another study has provided insight into how a protein called hypoxia-inducible factor (HIF) regulates manganese (Mn) in the liver and intestines. Mn induces parkinsonism at elevated levels. This research showed that certain compounds stabilized HIF to protect cells against Mn toxicity and reduced neuromotor deficits in mice, suggesting their potential as a therapeutic against neurotoxicity.

undergraduate levels, institutional training grants and fellowships at the graduate level, and support for early career investigators at the postgraduate level. NIEHS also works to increase diversity, equity, inclusion, and accessibility (DEIA) through training across its scientific and science management and support workforce. In 2022, NIEHS conducted a DEIA Assessment and developed a Racial, Ethnic, and Equity Plan (REEP, part of the broader NIH UNITE Initiative), which includes a range of training and education initiatives aimed at helping the Institute fulfill its commitment to a work culture where everyone is treated with dignity and respect.

The next generation of scientists will need to be knowledgeable and competent in data-driven technologies and novel biotechnological research. To meet this need, NIEHS is funding workforce development grants at the interface of information sciences, artificial intelligence, machine learning, and biomedical sciences. This funding will help ensure that the next generation of scientists can achieve impactful careers applying cutting-edge knowledge and skills to solve complex environmental health problems.

NIEHS Research-Intensive Short Courses and Educational Opportunities (RISE) program supports short courses of no more than a month that include hands-on training in novel and advanced environmental health sciences (EHS). The RISE program enables participants to return to their home institutions and adapt what they have learned to their own research, thus more fully integrating EHS concepts, tools, methods, and strategies into a variety of scientific disciplines. An important goal of RISE is to reach a broad audience and increase the diversity of EHS researchers.

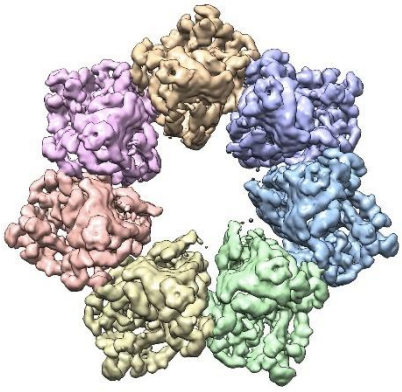
NIEHS funds programs that create individual and institutional EHS research capacity around the world as well as at home. One such program is a strategic collaboration between Emory University and the country of Georgia, which is significantly impacted by air pollution and secondhand smoke (SHS). Some 42 percent of Georgian adults experience daily SHS exposure and the country ranks third highest in the world in mortality from ambient and indoor air pollution. The Emory-Georgia Clean Air Research & Education (CARE) Program involves training, mentorship, and applied research opportunities for participating scientists to enhance scientific capacity in Georgia to conduct research on noncommunicable diseases with the goal of reducing health impacts.

Budget Policy: The FY 2024 President's Budget request for Training and Education is $46.5 million, an increase of $1.9 million or 4.3 percent compared to the FY 2023 Enacted level.

Intramural Research

The NIEHS intramural research program provides an arena for high-caliber science with potential for high-impact breakthroughs. Such studies span the gamut of environmental exposures, explore genetic and mechanistic causes of disease, and develop new scientific approaches to tackling the undiscovered. Many intramural research studies are conducted over long periods of time and among large cohorts of participants to yield results most likely to help

promote the public good. Such studies include epidemiological research on environmentally associated diseases and targeted prevention and intervention studies to reduce the effects of exposures to environmental hazards.



Mitochondrial diseases are a group of inherited conditions that affect 1 in 5,000 people and have very few treatments. Now, for the first time, scientists can map mutations that are causing often devastating mitochondrial diseases. NIEHS researchers developed a three-dimensional (3D) structure of the so-called twinkle protein that allows them to see how and where disease mutations can lead to mitochondrial diseases.[24] Exposure to toxics such as pesticides, antibiotics, and heavy metals, among others, can trigger mitochondrial disease in patients with underlying mutations. This breakthrough paves the way for the development of targeted treatments for patients who suffer from mitochondrial diseases such as muscle function disorders that lead to the loss of eye movement, a rare genetic disorder that can cause hearing loss, and various hereditary disorders in newborns and young children.

In the largest study to date of the effects of phthalates on pregnancy, NIEHS researchers suggest a link between exposure to these ubiquitous chemicals and risk of adverse pregnancy outcomes.[25] Phthalates are used in personal care products, such as cosmetics, as well as in solvents, detergents, and food packaging. The researchers found that women who were exposed to multiple phthalates during pregnancy had an increased risk of preterm birth. Preterm birth affects approximately 1 in every 10 infants born in the United States, and babies born too early have higher rates of death and disability. The results of this study provide further support for reducing the number of products that contain phthalates, as well as actions that can help reduce risks for expectant mothers and newborns, such as eating fresh foods, avoiding processed foods that come packaged in plastic containers or wrapping, and selecting fragrance-free products or those labeled "phthalate-free."

NIEHS researchers collaborating with scientists in the NIH Office of Dietary Supplements found new evidence that vitamin D may protect against breast cancer for certain racial/ethnic groups with low average circulating vitamin D levels.[26] Although women of color usually have lower vitamin D levels than non-Hispanic White women, few studies have examined the association between vitamin D and breast cancer within these racial/ethnic groups. The study found that that vitamin D protects against breast cancer in Black/African American and non-Black Hispanic/Latina women with a high prevalence of vitamin D deficiency and points to a potential intervention for women in these groups.

Budget Policy: The 2024 President's Budget request for Intramural Research is $263.8 million, an increase of $6.5 million or 2.5 percent compared with the FY 2023 Enacted level.

[24] pubmed.ncbi.nlm.nih.gov/35914129/
[25] pubmed.ncbi.nlm.nih.gov/35816333/
[26] pubmed.ncbi.nlm.nih.gov/35466399/

Research Management and Support

Efforts under Research Management and Support (RMS) include administrative, budgetary, logistical, and scientific support in the review, award, and monitoring of research grants and training awards. Other RMS functions include strategic planning, coordination, and evaluation of NIEHS programs; facilities administration and maintenance; regulatory and ethics training and compliance; and liaising with other Federal agencies, Congress, stakeholders, and the public.

NIEHS extramural staff have been working since early 2021 to establish and support a virtual network for Diversity Supplement recipients. The Diverse Researcher's Integrated Virtual Engagement Network (DRIVEN!) is designed to facilitate sharing and collaboration among students and new investigators who receive funding through these grant supplements. The platform enables staff to host virtual meetings with the recipients to provide training on grant writing, careers at NIH, and navigation of academic research careers, as well as opportunities for participants to regularly share their research with one another. Along with creating and supporting DRIVEN!, staff have increased the frequency of reviews for Diversity Supplement applications. The goal of devoting staff time to these efforts is to provide Diversity Supplement recipients with support, encouragement, and incentives to remain in the field of environmental health sciences.

Budget Policy: The 2024 President's Budget request for Research Management and Support is $42.4 million, an increase of $2.9 million or 7.3 percent compared with the FY 2023 Enacted level.

NATIONAL INSTITUTES OF HEALTH
National Institute of Environmental Health Sciences

Appropriations History

Fiscal Year	Budget Estimate to Congress	House Allowance	Senate Allowance	Appropriation
2015	$665,080,000			$667,502,000
Rescission				$0
2016	$681,782,000	$675,783,000	$695,900,000	$693,702,000
Rescission				$0
2017 [1]	$693,533,000	$710,387,000	$722,301,000	$714,261,000
Rescission				$0
2018	$533,537,000	$725,387,000	$737,727,000	$751,143,000
Rescission				$0
2019	$693,199,000	$760,113,000	$775,115,000	$774,707,000
Rescission				$0
2020	$666,854,000	$812,570,000	$815,729,000	$802,598,000
Rescission				$0
2021	$730,147,000	$809,501,000	$828,733,000	$814,675,000
Rescission				$0
2022	$937,107,000	$941,799,000	$936,271,000	$842,169,000
Rescission				$0
2023	$932,056,000	$878,750,000	$918,276,000	$913,979,000
Rescission				$0
2024	$938,807,000			

[1] Budget Estimate to Congress includes mandatory financing.

NATIONAL INSTITUTES OF HEALTH
National Institute of Environmental Health Sciences

Authorizing Legislation

	PHS Act/ Other Citation	U.S. Code Citation	2023 Amount Authorized	FY 2023 Enacted	2024 Amount Authorized	FY 2024 President's Budget
Research and Investigation	Section 301	42§241	Indefinite	$913,807,000	Indefinite	$938,807,000
National Institute of Environmental Health Sciences	Section 401(a)	42§281	Indefinite		Indefinite	
Total, Budget Authority				$913,807,000		$938,807,000

NATIONAL INSTITUTES OF HEALTH

National Institute of Environmental Health Sciences

Amounts Available for Obligation [1]

(Dollars in Thousands)

Source of Funding	FY 2022 Final	FY 2023 Enacted	FY 2024 President's Budget
Appropriation	$842,169	$913,979	$938,807
Secretary's Transfer	$0	$0	$0
OAR HIV/AIDS Transfers	-$7	-$172	$0
Subtotal, adjusted budget authority	$842,162	$913,807	$938,807
Unobligated balance, start of year	$0	$0	$0
Unobligated balance, end of year (carryover)	$0	$0	$0
Subtotal, adjusted budget authority	**$842,162**	**$913,807**	**$938,807**
Unobligated balance lapsing	$0	$0	$0
Total obligations	$842,162	$913,807	$938,807

[1] Excludes the following amounts (in thousands) for reimbursable activities carried out by this account:
FY 2022 - $8,302 FY 2023 - $12,000 FY 2024 - $12,000

NATIONAL INSTITUTES OF HEALTH
National Institute of Environmental Health Sciences

Budget Authority by Object Class[1]
(Dollars in Thousands)

		FY 2023 Enacted	FY 2024 President's Budget	FY 2024 +/- FY 2023
Total compensable workyears:				
	Full-time equivalent	685	685	0
	Full-time equivalent of overtime and holiday hours	1	1	0
	Average ES salary	$191	$201	$10
	Average GM/GS grade	12.0	12.0	0.0
	Average GM/GS salary	$111	$116	$6
	Average salary, Commissioned Corps (42 U.S.C. 207)	$106	$111	$5
	Average salary of ungraded positions	$168	$176	$8
	OBJECT CLASSES	**FY 2023 Enacted**	**FY 2024 President's Budget**	**FY 2024 +/- FY 2023**
	Personnel Compensation			
11.1	Full-Time Permanent	$52,771	$55,650	$2,878
11.3	Other Than Full-Time Permanent	$25,948	$27,364	$1,415
11.5	Other Personnel Compensation	$2,073	$2,186	$113
11.7	Military Personnel	$729	$769	$40
11.8	Special Personnel Services Payments	$9,891	$10,430	$539
11.9	**Subtotal Personnel Compensation**	**$91,412**	**$96,398**	**$4,986**
12.1	Civilian Personnel Benefits	$30,910	$32,457	$1,548
12.2	Military Personnel Benefits	$51	$53	$3
13.0	Benefits to Former Personnel	$0	$0	$0
	Subtotal Pay Costs	**$122,372**	**$128,909**	**$6,536**
21.0	Travel & Transportation of Persons	$765	$785	$20
22.0	Transportation of Things	$392	$392	$0
23.1	Rental Payments to GSA	$0	$0	$0
23.2	Rental Payments to Others	$25	$25	$1
23.3	Communications, Utilities & Misc. Charges	$260	$266	$6
24.0	Printing & Reproduction	$29	$29	$1
25.1	Consulting Services	$41,817	$42,288	$471
25.2	Other Services	$44,726	$43,302	-$1,424
25.3	Purchase of Goods and Services from Government Accounts	$84,198	$83,058	-$1,140
25.4	Operation & Maintenance of Facilities	$5,933	$5,933	$0
25.5	R&D Contracts	$126,164	$129,192	$3,028
25.6	Medical Care	$804	$836	$32
25.7	Operation & Maintenance of Equipment	$10,568	$10,541	-$27
25.8	Subsistence & Support of Persons	$0	$0	$0
25.0	**Subtotal Other Contractual Services**	**$314,209**	**$315,149**	**$940**
26.0	Supplies & Materials	$15,039	$15,018	-$21
31.0	Equipment	$10,117	$10,107	-$11
32.0	Land and Structures	$4,844	$4,835	-$8
33.0	Investments & Loans	$0	$0	$0
41.0	Grants, Subsidies & Contributions	$445,734	$463,270	$17,536
42.0	Insurance Claims & Indemnities	$0	$0	$0
43.0	Interest & Dividends	$21	$21	$0
44.0	Refunds	$0	$0	$0
	Subtotal Non-Pay Costs	**$791,435**	**$809,898**	**$18,464**
	Total Budget Authority by Object Class	**$913,807**	**$938,807**	**$25,000**

[1] Includes FTEs whose payroll obligations are supported by the NIH Common Fund.

NATIONAL INSTITUTES OF HEALTH

National Institute of Environmental Health Sciences

Salaries and Expenses

(Dollars in Thousands)

Object Classes	FY 2023 Enacted	FY 2024 President's Budget	FY 2024 +/- FY 2023
Personnel Compensation			
Full-Time Permanent (11.1)	$52,771	$55,650	$2,878
Other Than Full-Time Permanent (11.3)	$25,948	$27,364	$1,415
Other Personnel Compensation (11.5)	$2,073	$2,186	$113
Military Personnel (11.7)	$729	$769	$40
Special Personnel Services Payments (11.8)	$9,891	$10,430	$539
Subtotal, Personnel Compensation (11.9)	**$91,412**	**$96,398**	**$4,986**
Civilian Personnel Benefits (12.1)	$30,910	$32,457	$1,548
Military Personnel Benefits (12.2)	$51	$53	$3
Benefits to Former Personnel (13.0)	$0	$0	$0
Subtotal Pay Costs	**$122,372**	**$128,909**	**$6,536**
Travel & Transportation of Persons (21.0)	$765	$785	$20
Transportation of Things (22.0)	$392	$392	$0
Rental Payments to Others (23.2)	$25	$25	$1
Communications, Utilities & Misc. Charges (23.3)	$260	$266	$6
Printing & Reproduction (24.0)	$29	$29	$1
Other Contractual Services			
Consultant Services (25.1)	$41,817	$42,288	$471
Other Services (25.2)	$44,726	$43,302	-$1,424
Purchase of Goods and Services from Government Accounts (25.3)	$54,504	$55,458	$954
Operation & Maintenance of Facilities (25.4)	$5,933	$5,933	$0
Operation & Maintenance of Equipment (25.7)	$10,568	$10,541	-$27
Subsistence & Support of Persons (25.8)	$0	$0	$0
Subtotal Other Contractual Services	**$157,548**	**$157,522**	**-$26**
Supplies & Materials (26.0)	$15,039	$15,018	-$21
Subtotal Non-Pay Costs	**$174,058**	**$174,038**	**-$19**
Total Administrative Costs	**$296,430**	**$302,947**	**$6,517**

NATIONAL INSTITUTES OF HEALTH
National Institute of Environmental Health Sciences

Detail of Full-Time Equivalent Employment (FTE)

Office	FY 2022 Final			FY 2023 Enacted			FY 2024 President's Budget		
	Civilian	Military	Total	Civilian	Military	Total	Civilian	Military	Total
Division of Intramural Research									
Direct:	308	2	310	313	2	315	313	2	315
Reimbursable:	3	-	3	3	-	3	3	-	3
Total:	311	2	313	316	2	318	316	2	318
Office of the Director									
Direct:	67	1	68	85	-	85	85	-	85
Reimbursable:	-	-	-	-	-	-	-	-	-
Total:	67	1	68	85	-	85	85	-	85
Division of National Toxicology Program									
Direct:	97	1	98	106	2	108	106	2	108
Reimbursable:	-	-	-	-	-	-	-	-	-
Total:	97	1	98	106	2	108	106	2	108
Division of Extramural Research									
Direct:	76	-	76	88	-	88	88	-	88
Reimbursable:	3	-	3	3	-	3	3	-	3
Total:	79	-	79	91	-	91	91	-	91
Office of Management									
Direct:	78	2	80	81	2	83	81	2	83
Reimbursable:	-	-	-	-	-	-	-	-	-
Total:	78	2	80	81	2	83	81	2	83
Total	632	6	638	679	6	685	679	6	685
Includes FTEs whose payroll obligations are supported by the NIH Common Fund.									
FTEs supported by funds from Cooperative Research and Development Agreements.	0	0	0	0	0	0	0	0	0

FISCAL YEAR	Average GS Grade
2020	12.1
2021	12.0
2022	12.0
2023	12.0
2024	12.0

NATIONAL INSTITUTES OF HEALTH
National Institute of Environmental Health Sciences

Detail of Positions[1]

GRADE	FY 2022 Final	FY 2023 Enacted	FY 2024 President's Budget
Total, ES Positions	1	1	1
Total, ES Salary	$183,313	$190,875	$200,514
General Schedule			
GM/GS-15	37	40	40
GM/GS-14	66	71	71
GM/GS-13	123	132	132
GS-12	122	131	131
GS-11	72	77	77
GS-10	0	0	0
GS-9	37	40	40
GS-8	6	6	6
GS-7	13	14	14
GS-6	1	1	1
GS-5	1	1	1
GS-4	0	0	0
GS-3	0	0	0
GS-2	0	0	0
GS-1	0	0	0
Subtotal	478	513	513
Commissioned Corps (42 U.S.C. 207)			
Assistant Surgeon General	0	0	0
Director Grade	0	0	0
Senior Grade	4	4	4
Full Grade	1	1	1
Senior Assistant Grade	0	0	0
Assistant Grade	1	1	1
Subtotal	6	6	6
Ungraded	177	190	190
Total permanent positions	484	519	519
Total positions, end of year	662	710	710
Total full-time equivalent (FTE) employment, end of year	638	685	685
Average ES salary	$183,313	$190,875	$200,514
Average GM/GS grade	12.0	12.0	12.0
Average GM/GS salary	$106,485	$110,878	$116,477

[1] Includes FTEs whose payroll obligations are supported by the NIH Common Fund.