

National Institute of General Medical Sciences

CONGRESSIONAL JUSTIFICATION
FY 2023

Department of Health and Human Services
National Institutes of Health

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DEPARTMENT OF HEALTH AND HUMAN SERVICES

NATIONAL INSTITUTES OF HEALTH

National Institute of General Medical Sciences (NIGMS)

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Director's Overview

The National Institute of General Medical Sciences (NIGMS) supports fundamental biomedical research that elucidates and expands scientific knowledge of how living systems work at multiple levels, from individual molecules to cells, whole organisms, and populations. Such research provides the scientific groundwork for important clinical and technological breakthroughs that contribute to improving health outcomes. NIGMS supports this research while also supporting the training of the next generation of scientists, developing institutional biomedical research capacities in states throughout the country, and ensuring access to state-of-the-art resources that meet the research needs of a 21st century biomedical research workforce and enterprise.

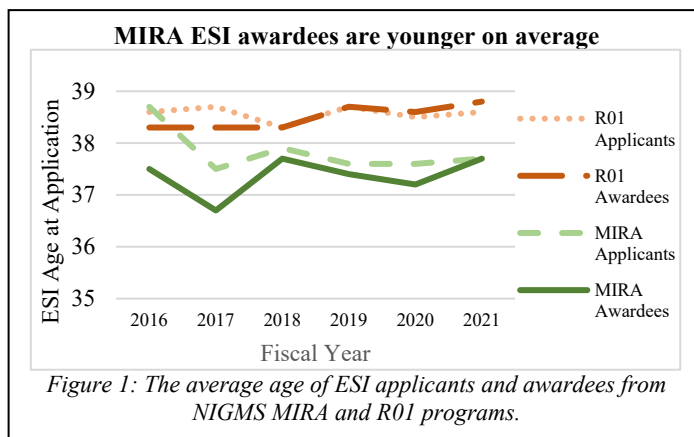


*Jon R. Lorsch, Ph.D.
Director, NIGMS*

In the past year, NIGMS has continued to actively contribute to NIH's ability to adjust to the health and research needs imposed by a rapidly evolving scientific and technological landscape. Needs that fall within the Institute's mission are reflected in its newly released Strategic Plan.¹ The 5-year plan, published in May of 2021, enumerates goals, objectives, and measurable targets that represent the Institute's commitment to supporting fundamental research, research training, capacity building, and diversity as well as the efficient stewardship of taxpayer resources (see Program Portrait on Evaluation later in the Justification of Budget Request section). Strengthening these important mission areas, particularly during the unanticipated challenges imposed by COVID-19, represents a key component of the Institute's ongoing efforts, as indicated by the priorities and examples outlined below.

Enhancing Research Support by Expanding the Maximizing Investigators' Research Award (MIRA) Program

To promote a creative and vibrant biomedical research enterprise, NIGMS has expanded its innovative approach to supporting investigator-initiated research through its MIRA program. MIRA supports the total program of research within an individual researcher's laboratory, thus providing them with a greater degree of scientific flexibility and stability, while also promoting scientific productivity and reducing administrative burden. In FY 2021, MIRA represented 41 percent of all NIGMS-funded R01-equivalent awards, an increase of 35 percentage points from the initial year of the program (2016). In addition, 80 percent of early-stage investigators (ESIs) funded by NIGMS received a MIRA award. The average age of a MIRA ESI awardee was 37.7 years, as opposed to 38.8 years for an NIGMS R01 Research Project Grant (RPG) ESI awardee (**Figure 1**). These data illustrate the ongoing enthusiasm



¹ nigms.nih.gov/about/dima/Documents/NIGMS-strategic-plan-2021-2025.pdf

within the scientific community for MIRA and the role that MIRA plays in transitioning ESIs toward scientific independence at progressively earlier timepoints in their careers.

Many important scientific advances have already been supported through the MIRA program, including: developing easier chemical methods for making mRNAs and other nucleic acids, which could transform how we manufacture these molecules for use as drugs or vaccines; inventing new technology that allows molecules to be visualized inside cells with unprecedented precision by combining fluorescence microscopy with cryo-electron tomography; using machine learning to more easily and accurately identify important gene control elements in DNA sequences; and identifying potent new anti-fungal molecules produced by the microbiome of the sea squirt that provide promising leads for treating drug-resistant fungal infections.

Continuing to Build an Inclusive and Diverse Biomedical Research Workforce

Stable funding throughout a researcher's career – such as that provided by the MIRA program – is important in sustaining a robust and productive biomedical research workforce. Of equal importance, however, is the ability to draw from an inclusive pool of talented individuals with different aptitudes, perspectives, interests, and experiences. To this end, NIGMS has continually sought to enhance the diversity of the biomedical research workforce by supporting individuals from a variety of backgrounds at multiple training and career stages, and in a variety of geographic locations, institutions, and educational settings across the country.

Despite increases in the number of individuals from historically underrepresented racial and ethnic groups earning biomedical Ph.D. degrees, there remains a comparative lack of diversity at the faculty level.² To help address this issue, NIGMS recently launched the Maximizing Opportunities for Scientific and Academic Independent Careers (MOSAIC) program in collaboration with 23 NIH Institutes, Centers, and Offices (ICOs). The objective of the MOSAIC program is to increase faculty diversity by supporting and mentoring researchers from diverse backgrounds, including women and individuals from underrepresented racial and ethnic groups, as they undertake the critical career transition from postdoctoral trainees to independent, tenure-track faculty positions at research-intensive academic institutions. MOSAIC includes two components: an institutional research education cooperative agreement (UE5) and an individual postdoctoral career transition award (K99/R00). The MOSAIC UE5 constitutes awards to independent organizations (such as professional societies) that will support the educational and career development activities of the MOSAIC K99/R00 scholars. In FY 2021, MOSAIC supported 29 scholars and 3 professional societies. Over two-thirds of the scholars were women and/or from historically underrepresented groups.

In addition to MOSAIC, NIGMS launched the Support for Research Excellence (SuRE) program as a successor to the Support of Competitive Research (SCORE) program based on the results of a comprehensive evaluation undertaken in FY 2020 (see Program Portrait on Evaluation later in the Justification of Budget Request section). The SuRE program builds research capacity at institutions that: a) enroll significant numbers of students from backgrounds nationally underrepresented in biomedical research; b) award baccalaureate and/or graduate degrees in biomedical sciences; and c) receive limited NIH RPG funding. This successor program not only

² Gibbs, et al., eLife 2016; Valantine, Lund & Gammie, CBE-Life Sciences Education, 2016; Hoppe et al, 2019; Lauer, 2020

demonstrates NIGMS' commitment to increasing diversity, but also to building capacity and using both data and evaluation to drive the effectiveness of its programs.

Further Developing the Nation's Biomedical Research Infrastructure

The Institutional Development Award (IDeA) program plays a critical role in building biomedical research capacity by broadening the geographic distribution of NIH funding. It supports faculty and student development and strengthens institutional research infrastructure in states that have historically received comparatively low levels of support from the NIH, as well as research projects on health-related matters that impact local communities within these states, including research involving both rural regions and tribal jurisdictions.

A healthy biomedical research infrastructure includes not only the development and dissemination of new tools and technologies but also access to important research resources. NIGMS has issued supplemental funding opportunities to allow the Centers supported under the IDeA program (e.g., the Centers of Biomedical Research Excellence, IDeA Networks of Biomedical Research Excellence, and other NIGMS-supported core facilities) to optimize their operations with state-of-the-art technology resources. NIGMS also supports Regional Resources that expand access to novel tools and technologies to a substantial user base at institutions across multiple states (regional) or across the country (national), thereby accelerating scientific inquiry, investigation, innovation, and progress (see Program Portrait on Infrastructure later in the Justification of Budget Request section).

Cryo-EM has provided insights into molecular structures that are relevant to issues ranging from COVID-19 (e.g., studying coronavirus spike proteins) to antidepressants and anti-nausea medications (e.g., studying the serotonin receptor).

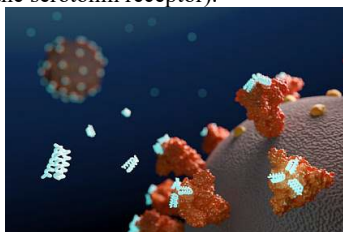


Figure 2: An artist's conception of computer-designed miniproteins (white) binding coronavirus spikes. UW Institute for Protein Design

One example of a cutting-edge technology to which researchers have access at national centers is Cryo-electron microscopy (Cryo-EM), which generates 3-dimensional images at nearly atomic resolution. NIGMS, along with the National Eye Institute, leads the NIH Common Fund's Transformative High-Resolution Cryo-EM Program. The Cryo-EM program consists of three national Cryo-EM Service Centers that offer access to and use of state-of-the-art equipment, technical support, and cross-training for the production and analysis of these high-resolution structures of biological molecules. Cryo-EM Centers have been instrumental in characterizing antibodies from COVID-19 patients and in providing many snapshots of the SARS-CoV-2 spike protein, including its mutations, complexed with different antibodies (**Figure 2**). Understanding this protein structure accelerates the progress of both fundamental and applied research related to the virus.

Pivoting to Address a Global Pandemic

Because it is impossible to predict when and where the next scientific advances or breakthroughs will originate, NIGMS continues to pursue a broad array of scientific research areas. This strategy has proved beneficial in being able to adapt to the unanticipated needs imposed by the ongoing COVID-19 pandemic. For example, NIGMS has supported researchers in repurposing research tools to help combat COVID-19, including tools used to track viral variants and model infectious diseases, and allowed researchers studying sepsis to pivot to research on COVID-19

management. Similarly, the Institute has leveraged its IDeA Networks for Clinical and Translational Research (IDeA-CTRs) for participation in the Accelerating COVID-19 Therapeutic Interventions and Vaccines (ACTIV) clinical trials in multiple IDeA states. NIGMS also supported IDeA-CTRs in establishing an IDeA State COVID-19 Patient Registry.

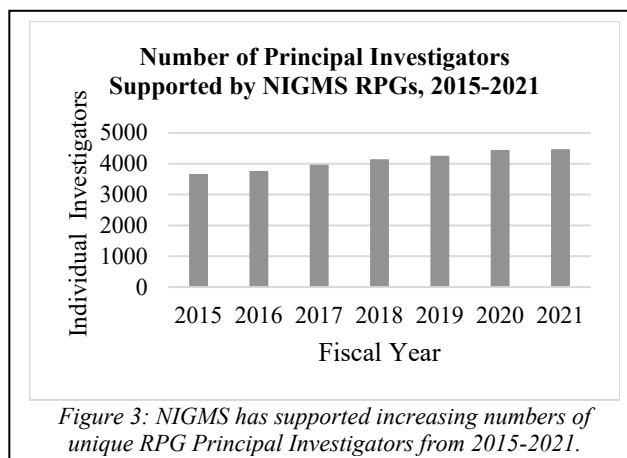
Furthermore, NIGMS has supported supplementary awards to grantees of the IDeA and Native American Research Centers for Health (NARCH) programs to study the emergence, evolution, and transmission of SARS-CoV-2 variants as well as the phenomenon of COVID-19 vaccine hesitancy, allowing grantees to use existing NIGMS-supported infrastructure to pivot toward COVID-19 related research in underserved states and communities. Finally, NIGMS has funded extensions to recipients of fellowships and mentored career awards, allowing early career scientists more stable support during this challenging time.

Looking Forward

In addition to continuing its strong support for investigator-initiated research and technology development, NIGMS is hoping to develop several new initiatives over the next year. These include: enhancement of the NARCH program and launching of several new programs to support research capacity building in American Indian/Alaska Native communities, based on the results of the NARCH evaluation and Tribal Consultation; a new program to support graduate students from diverse backgrounds in completing graduate school and successfully transitioning into postdoctoral research positions; and a branch of the Medical Scientist Training Program that would focus on building diversity in the clinician-scientist workforce.

Selected NIGMS Achievements from Funding Increases Received over FYs 2015-2021

- NIGMS supported 293 ESIs receiving their first major competing NIH RPG in FY 2021, a 9.7 percent increase over FY 2020; 234 of these new ESIs (80 percent) are supported through the MIRA program.
- NIGMS has been able to support an increasing number of unique principal investigators on RPGs every year since 2015, with 4,470 investigators supported in FY 2021 (**Figure 3**).



Established in 1962, the National Institute of General Medical Sciences (NIGMS) supports a broad spectrum of fundamental research ranging from studies of organisms, cells, genes, and molecules to whole body systems, laying the foundation that drives advances in human health. NIGMS also provides leadership in training the next generation of scientists, enhancing the diversity of the scientific workforce, and developing research capacity throughout the country.



NIGMS Strategic Priorities

- Sustain a robust, broad, and diverse portfolio of investigator-initiated, fundamental research that drives scientific discoveries and advances our understanding of human health and disease
- Invest in the training and development of a highly skilled, creative, adaptable, and diverse biomedical research workforce
- Build biomedical research capacity and ensure access to essential tools, technologies, capabilities, and other resources needed to conduct impactful biomedical research
- Demonstrate optimal stewardship of public funds by continually evaluating, improving, and communicating the role of the Institute's scientific investments



Jon R. Lorsch, Ph.D.
Director, NIGMS



NIGMS 2021–2025 Strategic Plan

NIGMS recently published its 2021–2025 Strategic Plan,¹ which sets the Institute's strategic priorities over the next five years and enumerates a series of goals, objectives, and implementation strategies. The plan includes representative targets for each implementation strategy that promote both transparency and accountability, ensuring that progress is tracked and periodically reported, and that any necessary course corrections can be quickly and effectively implemented.

NIGMS by the Numbers (in FY 2021)

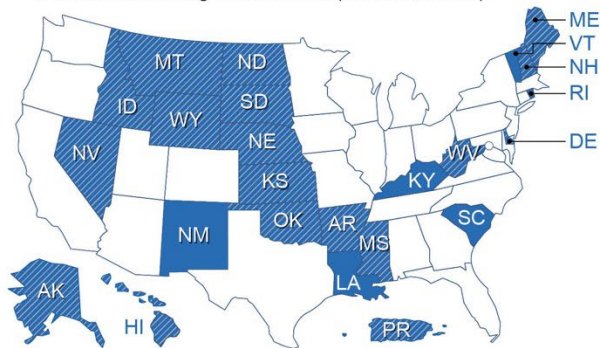
*competing & non-competing research project grants



NIGMS Funding History



The Institutional Development Award (IDeA) program builds institutional research capacity in **24** states/territories that have historically had low NIH funding (in blue, below). **17** of the IDeA states and Puerto Rico receive more than 20 percent of their NIH funding from NIGMS (hatched, below).



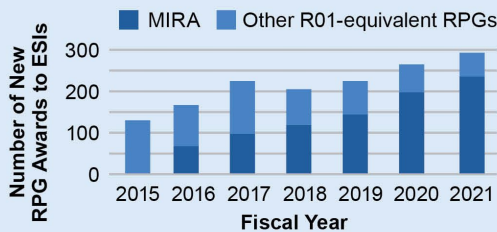
¹ nigms.nih.gov/about/dima/Documents/NIGMS-strategic-plan-2021-2025.pdf

■ IDeA states/territories with ≥20 percent of NIH funding from NIGMS

Recent Accomplishments

Supporting the Next Generation of Researchers

NIGMS awarded **293** early stage investigators (ESIs) new competing R01-equivalent research project grants (RPGs) in FY 2021.



Building a Diverse Scientific Workforce

NIGMS launched the Maximizing Opportunities for Scientific and Academic Independent Careers (MOSAIC) program to help promising postdoctoral researchers from diverse backgrounds transition into independent researchers.

In FY 2021, **23** NIH Institutes, Centers, and Offices collaborated to support **29** scholars (over two-thirds women and over two-thirds from underrepresented backgrounds) with career development led by **3** professional society partners.



Adapting to the COVID-19 Pandemic

NIGMS provided additional support for trainees during the pandemic through F and K award extensions and funds to support childcare costs.

20 IDEa states and Puerto Rico were able to leverage Networks for Clinical and Translational Research (IDEa-CTR) to expand IDEa state participation and representation in clinical trials for COVID-19 therapeutics and vaccines.

Ongoing and Future Initiatives

Maximizing Investigators' Research

NIGMS is expanding the use of its innovative **R35 Maximizing Investigators' Research Award (MIRA)**, which provides researchers greater scientific flexibility and stability while also promoting scientific productivity.

FY 2021–25 Strategic Plan Target

NIGMS aims to have MIRA grants constitute **60 percent** of its R01-equivalent portfolio by 2025.

As of FY 2021, MIRA grants have grown to 41 percent of the R01-equivalent portfolio supported by NIGMS.

Supporting Research Excellence

NIGMS launched the Support for Research Excellence (SuRE) program to increase diversity in the biomedical research workforce by providing research opportunities and enriching the research environment for undergraduate students at higher education institutions that both receive limited NIH research support and serve underrepresented students. The SuRE program was developed as a successor to the Support of Competitive Research (SCORE) program, incorporating the results of a comprehensive evaluation.²

Tackling Sepsis

NIGMS is expanding its portfolio of fundamental sepsis research, including support for collecting, banking, and sharing biospecimens and associated clinical data from sepsis patients.

NIGMS is also collaborating with the National Heart, Lung, and Blood Institute on a Phenotyping Consortium to understand the underlying mechanisms of critical illness syndromes (including sepsis) and recovery.

Addressing the Health Research Needs of Tribal Communities

NIGMS conducted an evaluation of the Native American Research Centers for Health (NARCH) program to ensure that it continues to meet health research, education, and capacity building needs that American Indian/Alaska Native (AI/AN) communities have identified and prioritized. As part of this evaluation, the Institute held a formal Tribal Consultation to solicit input from Tribal leaders and Tribal organizations, and posted the results publicly.²

NIGMS intends to continue its support for the NARCH program at or above current levels. Commensurate with feedback from members of AI/AN communities, NIGMS is planning enhancements to NARCH and is considering additional programs to help bridge the gaps between the expressed needs of Tribal nations and the types of support and resources that the current NARCH program can effectively provide.

² nigms.nih.gov/about/dima/Pages/reports.aspx

Major Changes in the Fiscal Year 2023 Budget Request

Major changes by budget mechanism and/or budget activity detail are briefly described below. The FY 2023 budget request for NIGMS is \$3,097.6 million, an increase of \$106.1 million from the FY 2022 continuing resolution (CR) level. The FY 2023 President's Budget reflects the Administration's fiscal policy goals for the Federal Government. Within this framework, NIGMS will pursue its highest research priorities through strategic investments and careful stewardship of appropriated funds:

Research Project Grants (+\$69.4 million; total \$2,029.0 million):

For FY 2023, NIGMS will continue to prioritize the support of investigator-initiated Research Project Grants (RPGs). By prioritizing the funding of new and early-stage investigators via programs like the Maximizing Investigators' Research Award, NIGMS will continue to invest in the pipeline of a diverse representation of researchers.

FY 2023 will be the second year of the Support for Research Excellence (SuRE) Award. This program will augment the opportunities of scientists and students from diverse backgrounds to better participate in investigator-initiated RPG research. SuRE evolves from its predecessor the Support of Competitive Research (SCORE), once funded through the Minority Biomedical Research Support (MBRS) sub-mechanism.

By prioritizing the growth of RPGs, competing RPGs will grow 5.7 percent relative to the FY 2022 CR level. Overall, RPGs see an increase of 3.5 percent.

Research Center Grants (+\$16.4 million; total \$479.6 million):

In FY 2023, NIGMS will continue to maintain its research center grant portfolio. The Centers Mechanism sees an overall 3.5 percent increase relative to the FY 2022 CR level. Like the overall increase for the Institute, the Institutional Development Award (IDeA) program will also receive a 3.5 percent increase. The IDeA total program level in FY 2023 is \$410.6 million.

Other Research (-\$24.3 million; total \$176.6 million):

This budget represents a -12.1 percent decrease from the FY 2022 CR level. FY 2023 will be the fourth year of transitioning programs from Other Research and MBRS into Institutional Training awards. The transition includes moving the Initiative for Maximizing Student Development (IMSD) and the Research Initiative for Scientific Enhancement (RISE), from the MBRS sub-mechanism, as well as Bridges to the Baccalaureate and Bridges to the Doctoral, from the Other sub-mechanism to new programs under the Training mechanism. These new programs established in FY 2020, the Graduate Research Training Initiative for Student Enhancement (G-RISE), the Undergraduate Research Training Initiative for Student Enhancement (U-RISE) and the Bridges Programs are similar to their predecessors. The transition of moving these trainees and students to these innovative NIGMS programs will better equip the institute to assist and track these fellows along the various stages of their career. This will result in reallocating \$9.8 million from MBRS and \$3.4 million from the Other Research Bridge program to Training, along with reallocating \$21.8 million from MBRS to RPGs for the SuRE program (mentioned in

the RPG section). While this budget represents a -41.7 percent reduction in MBRS, the intent of this evolution and shift allows for greater research opportunities for diversity in the research pipeline, along with more substantive training opportunities in the Ruth L. Kirchstein Training Awards.

The Maximizing Opportunities for Scientific and Academic Independent Careers (MOSAIC) program is part of NIH's efforts to enhance diversity within the academic biomedical research workforce and is designed to facilitate the transition of talented postdoctoral researchers from diverse backgrounds. The Career and Other Other Research submechanisms include a \$1.0 million increase for MOSAIC in FY 2023.

Ruth L. Kirchstein Training Awards (+\$31.5 million; total \$289.9 million):

Within this budget, Individual Fellowships receive a 2.2 percent increase due to 2.0 percent stipend increases and childcare costs per NIH training policy. Institutional Training sees a 13.0 percent increase due to \$9.8 million transitioning from MBRS and \$3.4 from Other Research for G-RISE and U-RISE, as described above. Additionally, \$10.0 million is needed for implementing the NIH-wide childcare allowance.

Research Management and Support (+\$12.2 million; total \$94.9 million):

Along with covering the costs of employee pay raises and benefit increases, this budget includes a \$4.9 million increase for associated pay costs for 25 new full-time equivalent employees. NIGMS relies on the efforts of its workforce to accomplish its core activities of reviewing, awarding, and managing its grants and contracts. Additionally, an increase of \$4.3 million is included in the FY 2023 RMS budget for the NIGMS portion of an NIH-wide Cybersecurity assessment.

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Budget Mechanism *
(Dollars in Thousands)

Mechanism	FY 2021 Final		FY 2022 CR		FY 2023 President's Budget		FY 2023 +/- FY 2022	
	Number	Amount	Number	Amount	Number	Amount	Number	Amount
Research Projects:								
Noncompeting	3,245	\$1,299,424	3,405	\$1,405,512	3,397	\$1,446,094	-8	\$40,582
Administrative Supplements	(724)	\$60,930	(634)	\$53,330	(657)	\$55,223	23	\$1,893
Competing:								
Renewal	348	\$169,937	197	\$85,121	209	\$89,954	12	\$4,833
New	837	\$340,951	744	\$320,216	785	\$338,399	41	\$18,183
Supplements	0	\$0	0	\$0	0	\$0	0	\$0
Subtotal, Competing	1,185	\$510,888	941	\$405,337	994	\$428,353	53	\$23,016
Subtotal, RPGs	4,430	\$1,871,242	4,346	\$1,864,179	4,391	\$1,929,670	45	\$65,491
SBIR/STTR	191	\$99,069	184	\$95,417	191	\$99,342	7	\$3,925
Research Project Grants	4,621	\$1,970,311	4,530	\$1,959,596	4,582	\$2,029,012	52	\$69,416
Research Centers								
Specialized/Comprehensive	159	\$424,032	159	\$424,032	164	\$439,085	5	\$15,053
Clinical Research	0	\$0	0	\$0	0	\$0	0	\$0
Biotechnology	22	\$36,871	22	\$36,871	23	\$38,180	1	\$1,309
Comparative Medicine	1	\$2,518	1	\$2,343	1	\$2,343	0	\$0
Research Centers in Minority Institutions	0	\$0	0	\$0	0	\$0	0	\$0
Research Centers	182	\$463,421	182	\$463,246	188	\$479,608	6	\$16,362
Other Research:								
Research Careers	130	\$34,020	145	\$34,620	169	\$36,849	24	\$2,229
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	\$11,719	0	\$11,719	0	\$11,719	0	\$0
Minority Biomedical Research Support	282	\$87,049	263	\$75,136	137	\$43,779	-126	-\$31,357
Other	217	\$80,372	211	\$79,438	216	\$84,266	5	\$4,828
Other Research	629	\$213,159	619	\$200,913	522	\$176,613	-97	-\$24,300
Total Research Grants	5,432	\$2,646,891	5,331	\$2,623,755	5,292	\$2,685,233	-39	\$61,478
Ruth L Kirschstein Training Awards:	FTTPs		FTTPs		FTTPs		FTTPs	
Individual Awards	341	\$19,100	340	\$19,533	340	\$19,967	0	\$434
Institutional Awards	4,298	\$214,858	4,684	\$238,834	4,965	\$269,945	281	\$31,111
Total Research Training	4,639	\$233,958	5,024	\$258,367	5,305	\$289,912	281	\$31,545
Research & Develop. Contracts	19	\$21,888	20	\$22,742	21	\$23,549	1	\$807
<i>SBIR/STTR (non-add)</i>	<i>(0)</i>	<i>(\$1,009)</i>	<i>(0)</i>	<i>(\$1,009)</i>	<i>(0)</i>	<i>(\$1,009)</i>	<i>(0)</i>	<i>(\$0)</i>
Intramural Research	0	\$3,519	0	\$3,836	0	\$3,972	0	\$136
Res. Management & Support	180	\$79,997	184	\$82,717	209	\$94,891	25	\$12,174
<i>SBIR Admin. (non-add)</i>	<i>(0)</i>	<i>(\$0)</i>	<i>(0)</i>	<i>(\$0)</i>	<i>(0)</i>	<i>(\$0)</i>	<i>(0)</i>	<i>(\$0)</i>
Construction		\$0		\$0		\$0		\$0
Buildings and Facilities		\$0		\$0		\$0		\$0
Total, NIGMS	180	\$2,986,253	184	\$2,991,417	209	\$3,097,557	25	\$106,140

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

NATIONAL INSTITUTE OF GENERAL MEDICAL SCIENCES

For carrying out section 301 and title IV of the PHS Act with respect to general medical sciences, \$3,097,557,000, of which \$1,271,505,000 shall be from funds available under section 241 of the PHS Act: Provided, That not less than \$410,644,000 is provided for the Institutional Development Awards program.

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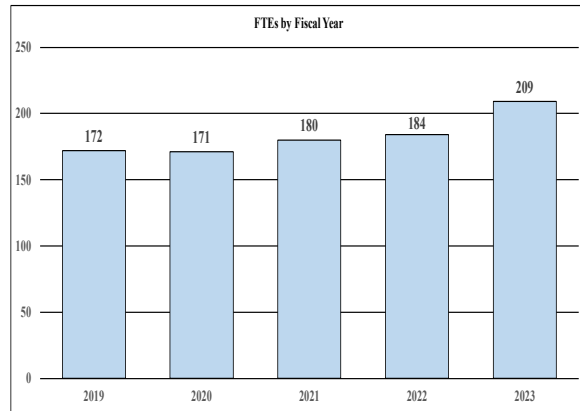
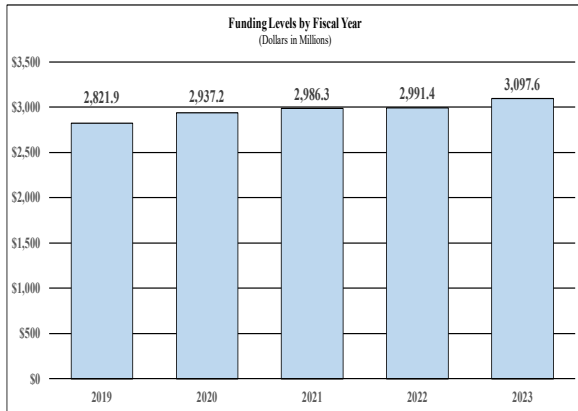
Summary of Changes
(Dollars in Thousands)

FY 2022 CR	\$2,991,417
FY 2023 President's Budget	\$3,097,557
Net change	\$106,140

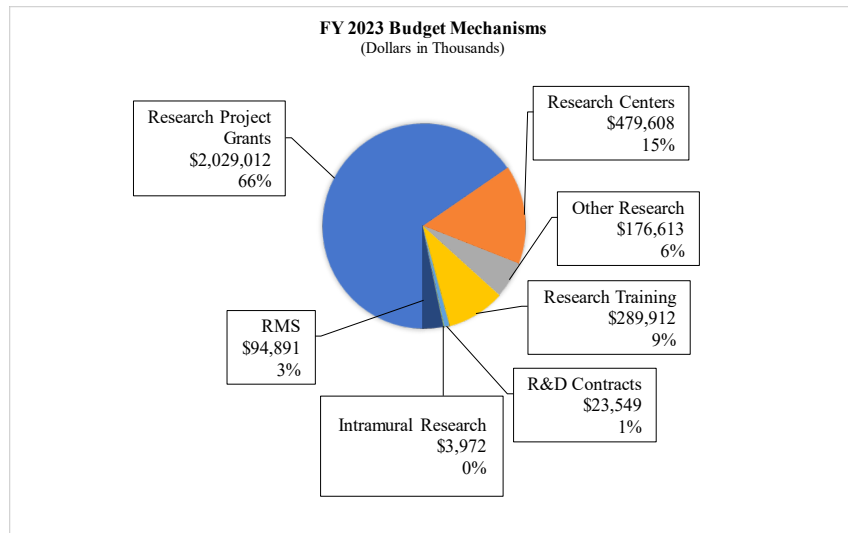
CHANGES	FY 2022 CR		FY 2023 President's Budget		Built-In Change from FY 2022 CR	
	FTEs	Budget Authority	FTEs	Budget Authority	FTEs	Budget Authority
A. Built-in:						
1. Intramural Research:						
a. Annualization of January 2022 pay increase & benefits		\$2,175		\$2,255		\$15
b. January FY 2023 pay increase & benefits		\$2,175		\$2,255		\$74
c. Paid days adjustment		\$2,175		\$2,255		-\$8
d. Differences attributable to change in FTE		\$2,175		\$2,255		\$0
e. Payment for centrally furnished services		\$159		\$162		\$3
f. Cost of laboratory supplies, materials, other expenses, and non-recurring costs		\$1,503		\$1,555		\$32
Subtotal						\$116
2. Research Management and Support:						
a. Annualization of January 2022 pay increase & benefits		\$34,732		\$40,894		\$230
b. January FY 2023 pay increase & benefits		\$34,732		\$40,894		\$1,173
c. Paid days adjustment		\$34,732		\$40,894		-\$132
d. Differences attributable to change in FTE		\$34,732		\$40,894		\$4,934
e. Payment for centrally furnished services		\$11,953		\$12,192		\$239
f. Cost of laboratory supplies, materials, other expenses, and non-recurring costs		\$36,032		\$41,805		\$781
Subtotal						\$7,225
Subtotal, Built-in						\$7,341
CHANGES	FY 2022 CR		FY 2023 President's Budget		Program Change from FY 2022 CR	
	No.	Amount	No.	Amount	No.	Amount
B. Program:						
1. Research Project Grants:						
a. Noncompeting	3,405	\$1,458,842	3,397	\$1,501,317	-8	\$42,475
b. Competing	941	\$405,337	994	\$428,353	53	\$23,016
c. SBIR/STTR	184	\$95,417	191	\$99,342	7	\$3,925
Subtotal, RPGs	4,530	\$1,959,596	4,582	\$2,029,012	52	\$69,416
2. Research Centers	182	\$463,246	188	\$479,608	6	\$16,362
3. Other Research	619	\$200,913	522	\$176,613	-97	-\$24,300
4. Research Training	5,024	\$258,367	5,305	\$289,912	281	\$31,545
5. Research and development contracts	20	\$22,742	21	\$23,549	1	\$807
Subtotal, Extramural		\$2,904,864		\$2,998,694		\$93,830
6. Intramural Research	0	\$3,836	0	\$3,972	0	\$20
7. Research Management and Support	184	\$82,717	209	\$94,891	25	\$4,949
8. Construction		\$0		\$0		\$0
9. Buildings and Facilities		\$0		\$0		\$0
Subtotal, Program	184	\$2,991,417	209	\$3,097,557	25	\$98,799
Total built-in and program changes						\$106,140

Fiscal Year 2023 Budget Graphs

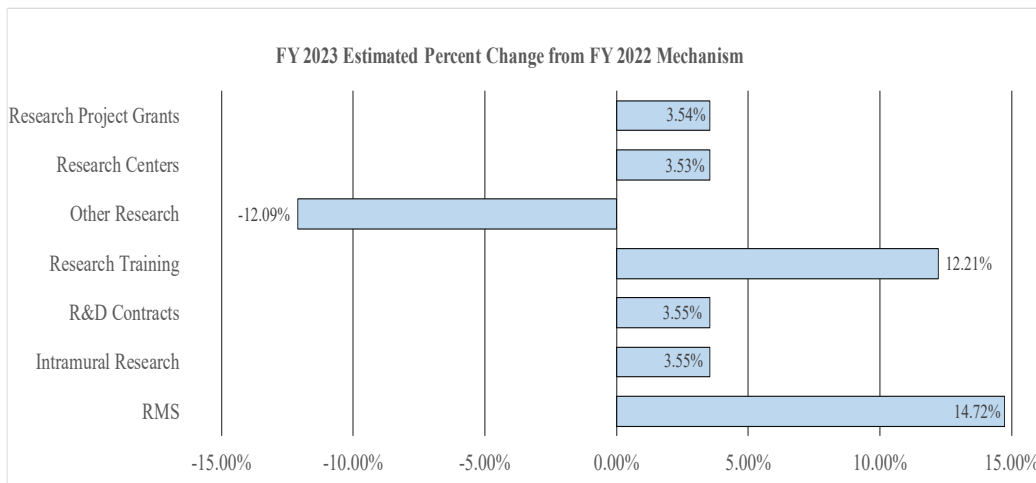
History of Budget Authority and FTEs:



Distribution by Mechanism:

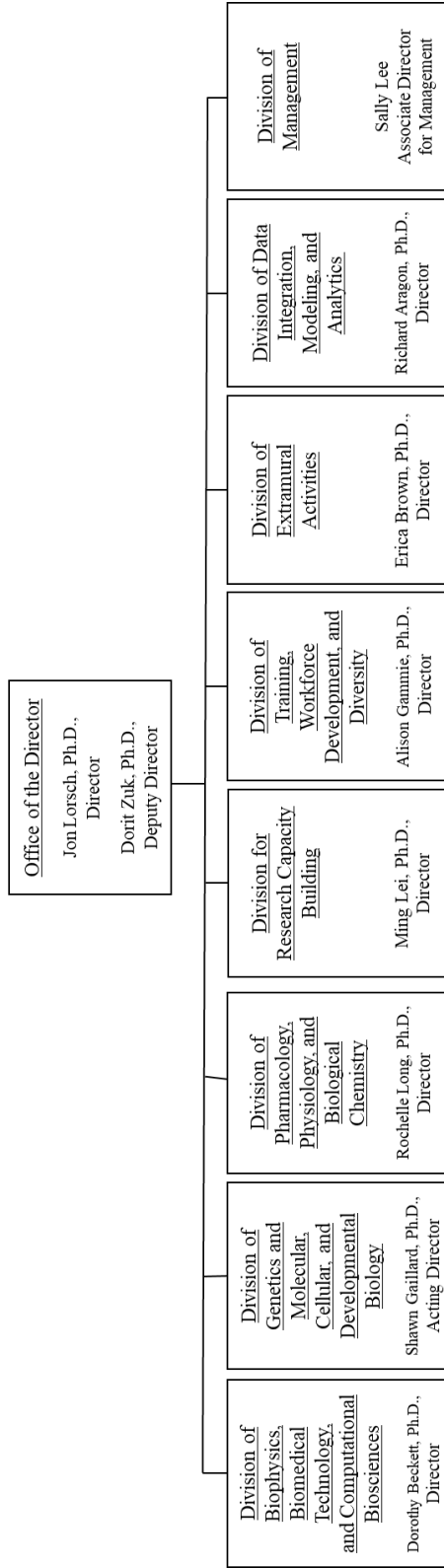


Change by Selected Mechanisms:



Organization Chart

National Institutes of Health
 National Institute of General Medical Sciences
 Organizational Chart



NATIONAL INSTITUTES OF HEALTH
National Institute of General Medical Sciences

Budget Authority by Activity *
(Dollars in Thousands)

	FY 2021 Final		FY 2022 CR		FY 2023 President's Budget		FY 2023 +/- FY 2022 CR	
	FTE	Amount	FTE	Amount	FTE	Amount	FTE	Amount
Extramural Research								
<u>Detail</u>								
Biophysics, Biomedical Technology, and Computational Biosciences		\$574,033		\$568,560		\$585,133		\$16,573
Genetics and Molecular, Cellular, and Developmental Biology		\$886,767		\$878,313		\$903,914		\$25,601
Pharmacology, Physiology and Biological Chemistry		\$604,411		\$598,648		\$616,098		\$17,450
Training, Workforce Development and Diversity		\$343,959		\$365,414		\$383,666		\$18,252
Division for Research Capacity Building (<i>Institutional Development Award (IDeA)</i>)		\$493,567 (\$396,573)		\$493,929 (\$396,573)		\$509,883 (\$410,644)		\$15,954 (\$14,071)
Subtotal, Extramural		\$2,902,737		\$2,904,864		\$2,998,694		\$93,830
Intramural Research	0	\$3,519	0	\$3,836	0	\$3,972	0	\$136
Research Management & Support	180	\$79,997	184	\$82,717	209	\$94,891	25	\$12,174
TOTAL	180	\$2,986,253	184	\$2,991,417	209	\$3,097,557	25	\$106,140

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

Justification of Budget Request

NIGMS

Authorizing Legislation: Section 301 and Title IV of the Public Health Service Act, as amended.

Budget Authority (BA):

	FY 2021 Final	FY 2022 CR	FY 2023 President's Budget	FY 2023 +/- FY 2022
BA	\$2,986,253,000	\$2,991,417,000	\$3,097,557,000	+106,140,000
FTE	180	184	209	+25

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

Overall Budget Policy: The FY 2023 President's Budget request for NIGMS is \$3,097.6 million, an increase of \$106.1 million or 3.5 percent compared to the FY 2022 CR level. This increase includes \$20.0 million to expand NIGMS programs addressing research into issues of health disparities.

Program Descriptions

Genetics and Molecular, Cellular, and Developmental Biology (GMCDB): The GMCDB division supports research to understand the structure and function of cells and cellular components, as well as the cellular and molecular mechanisms that underlie inheritance, gene expression, and development. The results of this research form the foundation for advances in diagnosing, preventing, treating, and curing a wide variety of diseases. Most of the projects supported by the division make use of research organisms, which advance the general understanding of biological processes. To complement GMCDB's substantial investment in research performed in a wide variety of research organisms, GMCDB will employ FY 2023 funds to bolster human research studies aimed at revealing the generalizable principles of the genetics of human biology and human disease.

Budget Policy

The FY 2023 President's Budget request for the GMCDB program is \$903.9 million, an increase of \$25.6 million or 2.9 percent compared to the FY 2022 CR level. GMCDB expenditures will support individual investigators seeking fundamental knowledge about biological processes. GMCDB will also continue its support for collaborative research on cellular, molecular, and genomic studies, as well as research into specific genetic variants within complex disorders.

Pharmacology, Physiology, and Biological Chemistry (PPBC): The PPBC division supports a broad spectrum of research aimed at improving the molecular-level understanding of fundamental biological processes and discovering approaches to their control.

Using Evaluations to Inform Decision Making

NIGMS has expanded its capacity to conduct analyses and evaluations of its scientific portfolio and internal operations with the goal of maximizing the efficiency and effectiveness of its programs. These activities inform program enhancements and ensure that NIGMS' programs continually meet their obligations to the scientific community and taxpayers.

As part of its commitment to transparency, NIGMS publicly posts the results of its program evaluations and actions taken in response to them. In the last 5 years, the Institute has conducted more than 15 evaluations and assessments. Recently, NIGMS convened a working group from its National Advisory General Medical Sciences Council (NAGMSC) to evaluate the goals and outcomes of the Support for Competitive Research (SCORE) program. Based on the outcomes of this evaluation, NIGMS reconfigured the SCORE program to become the Support for Research Excellence (SuRE) program. The SuRE program continues to support faculty development at institutions with limited NIH research project grant funding while now emphasizing research opportunities for students from groups historically underrepresented in biomedical research, as well as institutional commitment to research capacity development.

This year, NIGMS completed evaluation of the Native American Research Centers for Health program, which included a formal Tribal Consultation. The evaluation analyzed program outcomes and solicited feedback from various stakeholders, including Tribal Leaders, community members, and Tribal Organizations. Initial evaluation results were presented at the September 2021 NAGMSC meeting. Moving forward, the Institute is considering changes to the program to better meet the research, capacity building, and career enhancement needs of American Indian and Alaska Native communities. As set forth in its 2021-2025 Strategic Plan, NIGMS intends to conduct one to two evaluations per year, with a goal of evaluating at least 30 percent of its programs over the next 5 years.

Supporting Research Infrastructure

Just as a healthy community requires a well-maintained infrastructure such as roads, bridges and a power grid, a healthy scientific enterprise requires up-to-date research infrastructure. Maintaining this framework involves building research capacity, developing and disseminating new technologies, and providing scientists with access to critical equipment.

To provide researchers throughout the country access to cutting-edge scientific technologies, NIGMS recently started a program to support National and Regional Resources. Currently, the Institute is funding 12 resources, including a partnership between institutions in Arkansas and Oklahoma called the IDeA National Resource for Quantitative Proteomics, which is providing low-cost and, in some cases, even free access for researchers to technologies that allow them to identify proteins involved in normal biological functions and in diseases. Another NIGMS-funded resource in Wisconsin provides access to state-of-the-art magnetic resonance imaging technologies to aid in studying the 3D structures of biologically important molecules. Not only do these resources increase accessibility of technologies for researchers, they also save institutions and the taxpayers money by creating economies of scale and reducing the need for multiple universities to purchase and operate the same types of expensive equipment.

NIGMS also has a program to provide supplements to research grants to allow investigators to replace obsolete equipment in their labs with state-of-the-art instruments. This program has proven extremely popular and ensures that researchers in the U.S. remain at the cutting-edge of available scientific technology. This year, the Institute expanded this program to also provide supplementary funds to upgrade equipment at research centers, including those supported by the IDeA program. This has allowed institutional and regional facilities to enhance their capabilities and provide better research infrastructure to significant numbers of investigators.

including in critical illness and sepsis.

Biophysics, Biomedical Technology, and Computational Biosciences (BBCB): The BBCB division advances fundamental biomedical research by supporting technology development at all stages and its dissemination, the development of new computational tools for the biosciences and the application of biophysical and computational methods and techniques to decipher the mechanisms that govern biological processes. This year, BBCB continued to enhance its support for data resources and artificial intelligence approaches (e.g., computational facilities, software, and machine learning) to address a wide array of fundamental biomedical research questions.

Research supported by the division takes a multifaceted approach to problems in pharmacology, physiology, and biological chemistry that are very basic in nature. The goals of this research include an improved understanding of drug action and of anesthesia; mechanisms underlying responses to drugs; new methods and targets for drug discovery and production; advances in natural products synthesis; an enhanced understanding of biological catalysis; knowledge of metabolic regulation and fundamental physiological processes; and the integration and application of basic physiological, pharmacological, biochemical and data science research to clinical issues in anesthesia, sepsis, traumatic injury, and critical illness. The division works to ensure that research approaches are state-of-the-art and employ the optimal research organisms for the problems being addressed.

Budget Policy

The FY 2023 President's Budget request for the PPBC program is \$616.1 million, an increase of \$17.4 million or 2.9 percent compared to the FY 2022 CR level. PPBC will continue to emphasize the support of investigator-initiated research grants related to basic pharmacology, biochemistry, and chemistry that inform knowledge of how small molecules influence human health. Additionally, the division supports clinical research into fundamental health and disorders that affect multiple organ systems, and partners with others to accomplish specific objectives

Through the NIH-wide Knowledgebase and Data Repository Programs, NIGMS funded resources that provide the biomedical community access to reliable “big data” that is foundational to modern research. In addition, through its National and Regional Resources program (see Program Portrait earlier in this section), NIGMS continues to expand the availability of cutting-edge technologies to substantial numbers of NIH-supported researchers. Awards made this year provide tools and access to instrumentation for determining the structures and dynamics of biological molecules using x-ray crystallography, NMR spectroscopy, cryo-electron microscopy, and mass spectrometry. BBCB also supports biophysical techniques and studies, derived from the physical and engineering sciences, to develop and improve measurement and analysis of macromolecular, cellular, and organelle processes and functions.

Budget Policy

The FY 2023 President’s Budget request for the BBCB program is \$585.1 million, an increase of \$16.6 million or 2.9 percent compared to the FY 2022 CR level. BBCB will continue to fund investigator-initiated research to unravel the mechanisms that govern biological processes and develop novel methods, instruments and computational approaches to advance biomedical discovery. The division will also maintain support for resources that facilitate research by the broad biomedical research community.

Division of Training, Workforce

Development, and Diversity (TWD): The TWD division supports programs that foster the development of a strong and diverse biomedical research workforce. The division funds research training, student development, and career development activities through a variety of programs ranging from the undergraduate level

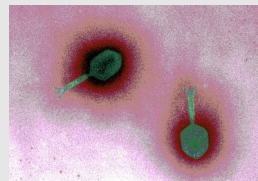
Potential Treatments for Antibiotic-Resistant Bacteria

Addressing the rise of antibiotic-resistant bacteria is a critical scientific and clinical priority. Researchers are investigating many alternative methods for treating bacterial infections that do not respond to existing antibiotics. One approach that could lead to effective new treatments is studying viruses that specifically attack bacteria, known as bacteriophages.

Dr. Ry Young of the Center for Phage Technology at Texas A&M University’s department of biochemistry and biophysics, is an expert in bacteriophages and their use in treating bacterial infections. NIGMS has supported Dr. Young for more than 38 years. He and his team recently described a process of particular therapeutic interest called single-gene lysis (SGL); wherein certain bacteriophages produce an SGL protein that blocks a necessary step in bacterial cell wall formation. As a result, the bacteria can no longer form cell walls and are subsequently destroyed when they try to divide. Dr. Young and his team are studying these SGL proteins as models for a completely new and promising class of antibiotics.

Researchers are also investigating whether bacteriophages themselves can be used to treat bacterial infections. Dr. Young and researchers at the Center for Phage Technology successfully demonstrated this approach when they helped prepare a therapeutic bacteriophage cocktail to treat a patient infected with drug-resistant *Acinetobacter baumannii*—a bacterium considered an urgent threat by the CDC—under an FDA expanded-access protocol. The patient eventually made a full recovery, and his story was chronicled in an award-winning book.³

Similarly, other research efforts focus on the use of bacteriophages for the treatment of drug-resistant *Klebsiella pneumoniae*, which can cause multiple health care-associated infections (e.g., pneumonia, wound infections, meningitis), and *Burkholderia cepacia* complex, which causes infections among hospitalized patients and people with cystic fibrosis, cancer, or AIDS.



Bacteriophage imaged by David Gregory and Debbie Marshall. CC BY 4.0

³ pubmed.ncbi.nlm.nih.gov/28807909/, theperfectpredator.com/

to the doctorate and beyond. TWD also administers the Common Fund Diversity Program Consortium, including the Coordination and Evaluation Center, Building Infrastructure Leading to Diversity, National Research Mentoring Network, Sponsored Programs Administration Development Program, and the Diversity Program Consortium Dissemination and Translation Awards. TWD-funded initiatives include the Diversity Supplement Program, Bridges to the Baccalaureate, Maximizing Access to Research Careers, Research Initiative for Scientific Enhancement, Initiative for Maximizing Student Development, Post-baccalaureate Research Education, Bridges to the Doctorate, National Research Service Award fellowships and training grants, Pathway to Independence Awards, Career Awards, Institutional Research and Academic Career Development Awards, Innovative Programs to Enhance Research Training, Support for Research Training Conferences, the Research on Interventions Program, and the Science of Science Policy Awards. TWD recently launched a new program called “Maximizing Opportunities for Scientific and Academic Independent Careers.” Collectively, these programs are designed to ensure that future generations of researchers will be drawn from the entire pool of talented individuals, bringing different perspectives, interests, and experiences to address complex scientific problems. NIGMS seeks to enhance the diversity of the biomedical research workforce by supporting individuals from a variety of backgrounds at multiple training and career stages in a variety of institutions and educational settings across the country.

Budget Policy

The FY 2023 President’s Budget request for the TWD program is \$383.7 million, an increase of \$18.3 million or 5.0 percent compared to the FY 2022 CR level. TWD will continue to support these programs and Individual and Institutional Training awards. The FY 2023 request provides for a 2.0 percent stipend increase and continues implementation of the NIH-wide childcare allowance. TWD will continue transitioning a number of previous institutional research education awards to National Research Service Award Institutional Training Grants, thereby increasing the number of individuals supported by this mechanism.

Division for Research Capacity Building (DRCB): DRCB administers four major programs that support research, research infrastructure improvement, faculty development, and research training. The IDeA program broadens the geographic distribution of NIH funding for biomedical research in 23 states and Puerto Rico (i.e., states that historically have had low levels of NIH funding). There are five major IDeA funding initiatives: (1) the Centers of Biomedical Research Excellence (COBRE) initiative develops thematic biomedical research centers with a particular emphasis on promoting the independent careers of early-stage investigators; (2) the IDeA Networks of Biomedical Research Excellence (INBRE) initiative supports statewide networks of research-intensive institutions and primarily undergraduate institutions to expand biomedical research access and capabilities; (3) the IDeA Networks for Clinical and Translational Research (IDeA-CTR) initiative promotes the advancement of clinical and translational research that addresses health concerns in IDeA eligible states; (4) the IDeA co-funding initiative aims to increase the pool of NIH-funded investigators; and (5) the IDeA Regional Entrepreneurship Development (I-RED) (Small Business Technology Transfer [STTR]) program supports small business concerns in IDeA states to develop educational products that promote entrepreneurship in IDeA states’ academic institutions and biotechnology sectors. Training and education efforts utilizing these products are expected to build biomedical researchers and students’ entrepreneurial skills needed to move scientific discoveries and innovative technologies out of

the lab and into commercial products. The recently launched Support for Research Excellence (SuRE) program is a research capacity building program that seeks to develop and sustain research excellence at higher education institutions that have strong records of serving students from backgrounds underrepresented in biomedical research, award baccalaureate and/or graduate degrees in science, and receive limited research grant support from the NIH. The Native American Research Centers for Health (NARCH) program funds research by American Indian (AI)/Alaska Native (AN) tribes or tribally based organizations, supports research infrastructure and develops biomedical research capabilities of AI/AN communities. The Science Education Partnership Awards (SEPA) program invests in capacity building projects geared towards pre-kindergarten to grade 12 students and the lay population that complement or enhance the training of a workforce to meet the nation's biomedical, biobehavioral, and clinical research needs. In response to the COVID-19 pandemic, DRCB has been actively engaged in mobilizing its research communities to participate in NIH's Rapid Acceleration of Diagnostics-Underserved Populations (RADx-UP) initiative, the National COVID Cohort Collaborative, and other COVID-related activities.

Budget Policy

The FY 2023 President's Budget request for the DRCB program is \$509.9 million, an increase of \$16.0 million or 3.2 percent compared to the FY 2022 CR level. DRCB will continue to support new and continuing awards in these programs. DRCB also supports the use of Small Business Innovation Research/STTR funds to initiate small business and technology transfer activities in IDeA states and to promote the commercialization of STEM education resources.

Intramural Research: NIGMS has a small but unique intramural research training program, the NIGMS Postdoctoral Research Associate Training (PRAT) Program. The NIGMS PRAT Program is a competitive three-year postdoctoral fellowship program that provides high quality research training in the basic biomedical sciences in intramural research laboratories at other NIH institutes and centers. The program prepares trainees for leadership positions in biomedical careers through mentored laboratory research, networking, and intensive career and leadership development activities. The program places special emphasis on training fellows in all areas that are within the NIGMS mission, including but not limited to biological chemistry, biophysics, bioinformatics, cellular and molecular biology, computational biosciences, developmental biology, genetics, immunology, pharmacology, physiology, and technology development. The PRAT program includes professional development activities tailored to the PRAT fellows, such as a monthly seminar series featuring presentations by current PRAT fellows and outside speakers whom the fellows have invited, and training sessions focused on grant-writing, career planning, communications skills, and leadership skills.

Budget Policy

The FY 2023 President's Budget request for NIGMS intramural research is \$4.0 million, an increase of \$0.1 million or 3.5 percent compared to the FY 2022 CR level.

Research Management and Support (RMS): RMS provides administrative, budgetary, logistical, and scientific support toward the review, award, and monitoring of research grants, training awards, and research and development contracts. RMS funds also support strategic planning, coordination, and evaluation of NIGMS programs; regulatory compliance; and

coordination and engagement with other Federal agencies, Congress, and the general public. RMS continues to fund development and enhancements to enterprise information technology (IT) tools which facilitate the review, award, funding, and monitoring of grants and contracts. Utilizing technologies such as natural language processing, artificial intelligence, and data reporting and visualization toolsets, funds are allocated to enterprise applications that facilitate the overall grants business process lifecycle and improve decision support capability. In addition, RMS is funding the expansion of NIGMS' presence in the enterprise cloud environment. Migration of the NIGMS infrastructure to the NIH enterprise cloud environment allows for systems to be developed and hosted in an environment that results in reduced resource dependencies, operational and maintenance cost savings, enhanced cybersecurity and disaster recovery, while ensuring compliance with the Federal Information Technology Acquisition Reform Act.

Budget Policy

The FY 2023 President's Budget request for RMS at NIGMS is \$94.9 million, an increase of \$12.2 million or 14.7 percent compared to the FY 2022 CR level. The increase will provide for 25 new full-time equivalent employees needed to better serve the Institute's growing programs and managing its grants and contracts. RMS funds support the operational needs of the Institute, including its necessary investments in information technology. Examples include supporting cybersecurity infrastructure requirements, enhancing cloud presence, and optimizing automated decision support capability within NIGMS.

**NATIONAL INSTITUTES OF HEALTH
National Institute of General Medical Sciences**

Appropriations History

Fiscal Year	Budget Estimate to Congress	House Allowance	Senate Allowance	Appropriation
2014	\$2,401,011,000		\$2,435,570,000	\$2,364,147,000
Rescission				\$0
2015	\$2,368,877,000			\$2,371,476,000
Rescission				\$0
2016	\$2,433,780,000	\$2,439,437,000	\$2,511,431,000	\$2,512,073,000
Rescission				\$0
2017 ¹	\$2,512,437,000	\$2,538,851,000	\$2,633,755,000	\$2,650,838,000
Rescission				\$0
2018	\$2,185,509,000	\$2,713,775,000	\$2,887,194,000	\$2,785,400,000
Rescission				\$0
2019	\$2,572,669,000	\$2,818,667,000	\$2,874,292,000	\$2,872,780,000
Rescission				\$0
2020	\$2,472,838,000	\$3,033,183,000	\$2,969,113,000	\$2,937,218,000
Rescission				\$0
2021	\$2,672,074,000	\$2,972,479,000	\$3,046,962,000	\$2,991,417,000
Rescission				\$0
2022	\$3,096,103,000	\$3,139,656,000	\$3,067,557,000	\$2,991,417,000
Rescission				\$0
2023	\$3,097,557,000			

¹ Budget Estimate to Congress includes mandatory financing

**NATIONAL INSTITUTES OF HEALTH
National Institute of General Medical Sciences**

Authorizing Legislation

	PHS Act/ Other Citation	U.S. Code Citation	2022 Amount Authorized	FY 2022 CR	2023 Amount Authorized	FY 2023 President's Budget
Research and Investigation	Section 301	42§241	Indefinite	\$2,991,417,000	Indefinite	\$3,097,557,000
National Institute of General Medical Sciences	Section 401(a)	42§281	Indefinite		Indefinite	
Total, Budget Authority				\$2,991,417,000		\$3,097,557,000

NATIONAL INSTITUTES OF HEALTH
National Institute of General Medical Sciences

Amounts Available for Obligation ¹
(Dollars in Thousands)

Source of Funding	FY 2021 Final	FY 2022 CR	FY 2023 President's Budget
Appropriation	\$2,991,417	\$2,991,417	\$3,097,557
Secretary's Transfer	-\$5,164	\$0	\$0
OAR HIV/AIDS Transfers	\$0	\$0	\$0
Subtotal, adjusted budget authority	\$2,986,253	\$2,991,417	\$3,097,557
Unobligated balance, start of year	\$0	\$0	\$0
Unobligated balance, end of year (carryover)	\$0	\$0	\$0
Subtotal, adjusted budget authority	\$2,986,253	\$2,991,417	\$3,097,557
Unobligated balance lapsing	-\$65	\$0	\$0
Total obligations	\$2,986,188	\$2,991,417	\$3,097,557

¹ Excludes the following amounts (in thousands) for reimbursable activities carried out by this account:
FY 2021 - \$1,384 FY 2022 - \$5,000 FY 2023 - \$5,000

NATIONAL INSTITUTES OF HEALTH
National Institute of General Medical Sciences

Budget Authority by Object Class¹
(Dollars in Thousands)

	FY 2022 CR	FY 2023 President's Budget	FY 2023 +/- FY 2022
Total compensable workyears:			
Full-time equivalent	184	209	25
Full-time equivalent of overtime and holiday hours	0	0	0
Average ES salary	\$205	\$213	\$8
Average GM/GS grade	13.1	13.2	0.1
Average GM/GS salary	\$135	\$140	\$5
Average salary, Commissioned Corps (42 U.S.C. 207)	\$0	\$0	\$0
Average salary of ungraded positions	\$209	\$217	\$8
OBJECT CLASSES	FY 2022 CR	FY 2023 President's Budget	FY 2023 +/- FY 2022
Personnel Compensation			
11.1 Full-Time Permanent	\$22,351	\$26,338	\$3,987
11.3 Other Than Full-Time Permanent	\$2,261	\$2,664	\$403
11.5 Other Personnel Compensation	\$806	\$950	\$144
11.7 Military Personnel	\$0	\$0	\$0
11.8 Special Personnel Services Payments	\$1,849	\$1,918	\$69
11.9 Subtotal Personnel Compensation	\$27,267	\$31,870	\$4,603
12.1 Civilian Personnel Benefits	\$9,640	\$11,279	\$1,639
12.2 Military Personnel Benefits	\$0	\$0	\$0
13.0 Benefits to Former Personnel	\$0	\$0	\$0
Subtotal Pay Costs	\$36,907	\$43,148	\$6,242
21.0 Travel & Transportation of Persons	\$5	\$35	\$30
22.0 Transportation of Things	\$1	\$2	\$0
23.1 Rental Payments to GSA	\$0	\$0	\$0
23.2 Rental Payments to Others	\$0	\$0	\$0
23.3 Communications, Utilities & Misc. Charges	\$49	\$52	\$3
24.0 Printing & Reproduction	\$0	\$0	\$0
25.1 Consulting Services	\$13,031	\$13,319	\$289
25.2 Other Services	\$12,684	\$13,395	\$711
25.3 Purchase of Goods and Services from Government Accounts	\$72,898	\$85,274	\$12,376
25.4 Operation & Maintenance of Facilities	\$708	\$741	\$33
25.5 R&D Contracts	\$797	\$877	\$80
25.6 Medical Care	\$0	\$0	\$0
25.7 Operation & Maintenance of Equipment	\$1,665	\$1,755	\$90
25.8 Subsistence & Support of Persons	\$0	\$0	\$0
25.0 Subtotal Other Contractual Services	\$101,784	\$115,361	\$13,578
26.0 Supplies & Materials	\$7	\$7	\$0
31.0 Equipment	\$1,325	\$1,038	-\$287
32.0 Land and Structures	\$697	\$729	\$33
33.0 Investments & Loans	\$0	\$0	\$0
41.0 Grants, Subsidies & Contributions	\$1,579,138	\$1,665,679	\$86,542
42.0 Insurance Claims & Indemnities	\$0	\$0	\$0
43.0 Interest & Dividends	\$0	\$0	\$0
44.0 Refunds	\$0	\$0	\$0
Subtotal Non-Pay Costs	\$1,683,005	\$1,782,904	\$99,898
Total Budget Authority by Object Class	\$1,719,912	\$1,826,052	\$106,140

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

NATIONAL INSTITUTES OF HEALTH
National Institute of General Medical Sciences

Salaries and Expenses
(Dollars in Thousands)

Object Classes	FY 2022 CR	FY 2023 President's Budget	FY 2023 +/- FY 2022
<u>Personnel Compensation</u>			
Full-Time Permanent (11.1)	\$22,351	\$26,338	\$3,987
Other Than Full-Time Permanent (11.3)	\$2,261	\$2,664	\$403
Other Personnel Compensation (11.5)	\$806	\$950	\$144
Military Personnel (11.7)	\$0	\$0	\$0
Special Personnel Services Payments (11.8)	\$1,849	\$1,918	\$69
Subtotal, Personnel Compensation (11.9)	\$27,267	\$31,870	\$4,603
Civilian Personnel Benefits (12.1)	\$9,640	\$11,279	\$1,639
Military Personnel Benefits (12.2)	\$0	\$0	\$0
Benefits to Former Personnel (13.0)	\$0	\$0	\$0
Subtotal Pay Costs	\$36,907	\$43,148	\$6,242
Travel & Transportation of Persons (21.0)	\$5	\$35	\$30
Transportation of Things (22.0)	\$1	\$2	\$0
Rental Payments to Others (23.2)	\$0	\$0	\$0
Communications, Utilities & Misc. Charges (23.3)	\$49	\$52	\$3
Printing & Reproduction (24.0)	\$0	\$0	\$0
<u>Other Contractual Services</u>			
Consultant Services (25.1)	\$13,031	\$13,319	\$289
Other Services (25.2)	\$12,684	\$13,395	\$711
Purchase of Goods and Services from Government Accounts (25.3)	\$57,325	\$67,558	\$10,234
Operation & Maintenance of Facilities (25.4)	\$708	\$741	\$33
Operation & Maintenance of Equipment (25.7)	\$1,665	\$1,755	\$90
Subsistence & Support of Persons (25.8)	\$0	\$0	\$0
Subtotal Other Contractual Services	\$85,413	\$96,769	\$11,356
Supplies & Materials (26.0)	\$7	\$7	\$0
Subtotal Non-Pay Costs	\$85,475	\$96,864	\$11,389
Total Administrative Costs	\$122,382	\$140,013	\$17,631

**NATIONAL INSTITUTES OF HEALTH
National Institute of General Medical Sciences**

Detail of Full-Time Equivalent Employment (FTE)

Office	FY 2021 Final			FY 2022 CR			FY 2023 President's Budget		
	Civilian	Military	Total	Civilian	Military	Total	Civilian	Military	Total
Division of Extramural Activities									
Direct:	69	-	69	70	-	70	73	-	73
Total:	69	-	69	70	-	70	73	-	73
Office of the Director									
Direct:	2	-	2	3	-	3	6	-	6
Total:	2	-	2	3	-	3	6	-	6
Division of Data, Integration, Modeling and Analytics									
Direct:	7	-	7	8	-	8	9	-	9
Total:	7	-	7	8	-	8	9	-	9
Division of Management									
Direct:	39	-	39	40	-	40	44	-	44
Total:	39	-	39	40	-	40	44	-	44
Division of Genetics and Molecular, Cellular, and Developmental Biology									
Direct:	17	-	17	17	-	17	19	-	19
Total:	17	-	17	17	-	17	19	-	19
Division of Pharmacology, Physiology and Biological Chemistry									
Direct:	12	-	12	12	-	12	13	-	13
Total:	12	-	12	12	-	12	13	-	13
Division of Biophysics, Biomedical Technology, and Computational Biosciences									
Direct:	10	-	10	10	-	10	14	-	14
Total:	10	-	10	10	-	10	14	-	14
Division of Training, Workforce Development and Diversity									
Direct:	12	-	12	12	-	12	15	-	15
Total:	12	-	12	12	-	12	15	-	15
Division for Research Capacity Building									
Direct:	12	-	12	12	-	12	16	-	16
Total:	12	-	12	12	-	12	16	-	16
Total	180	-	180	184	-	184	209	-	209
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								
2019	12.9								
2020	13.0								
2021	13.1								
2022	13.1								
2023	13.2								

NATIONAL INSTITUTES OF HEALTH
National Institute of General Medical Sciences

Detail of Positions¹

GRADE	FY 2021 Final	FY 2022 CR	FY 2023 President's Budget
Total, ES Positions	1	1	1
Total, ES Salary	\$199,300	\$205,319	\$213,002
General Schedule			
GM/GS-15	25	25	28
GM/GS-14	68	70	87
GM/GS-13	52	56	63
GS-12	8	7	6
GS-11	5	4	4
GS-10	0	0	0
GS-9	5	5	4
GS-8	6	6	6
GS-7	6	6	6
GS-6	0	0	0
GS-5	0	0	0
GS-4	0	0	0
GS-3	0	0	0
GS-2	0	0	0
GS-1	0	0	0
Subtotal	175	179	204
Commissioned Corps (42 U.S.C. 207)			
Assistant Surgeon General	0	0	0
Director Grade	0	0	0
Senior Grade	0	0	0
Full Grade	0	0	0
Senior Assistant Grade	0	0	0
Assistant Grade	0	0	0
Subtotal	0	0	0
Ungraded	21	21	21
Total permanent positions	176	180	205
Total positions, end of year	197	201	226
Total full-time equivalent (FTE) employment, end of year	180	184	209
Average ES salary	\$199,300	\$205,319	\$213,002
Average GM/GS grade	13.1	13.1	13.2
Average GM/GS salary	\$130,670	\$134,616	\$139,654

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