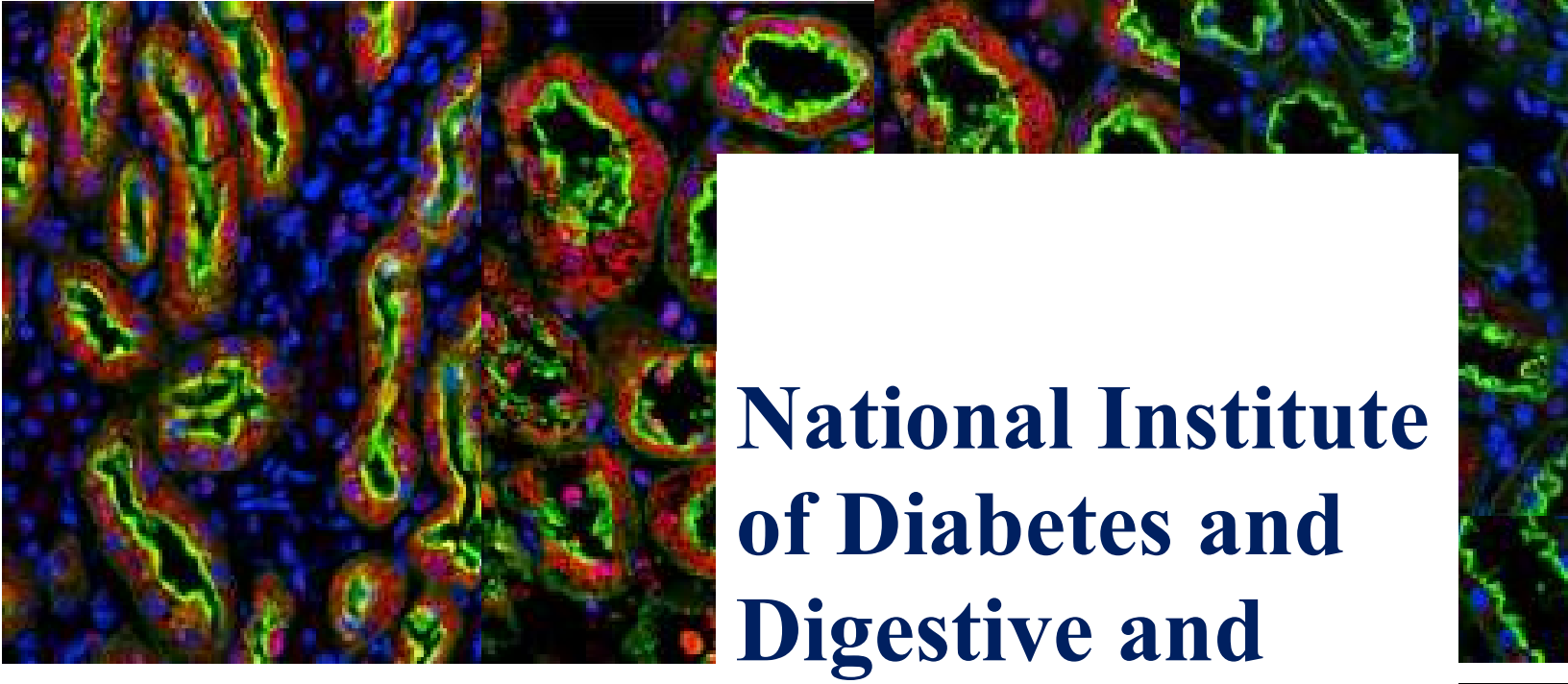
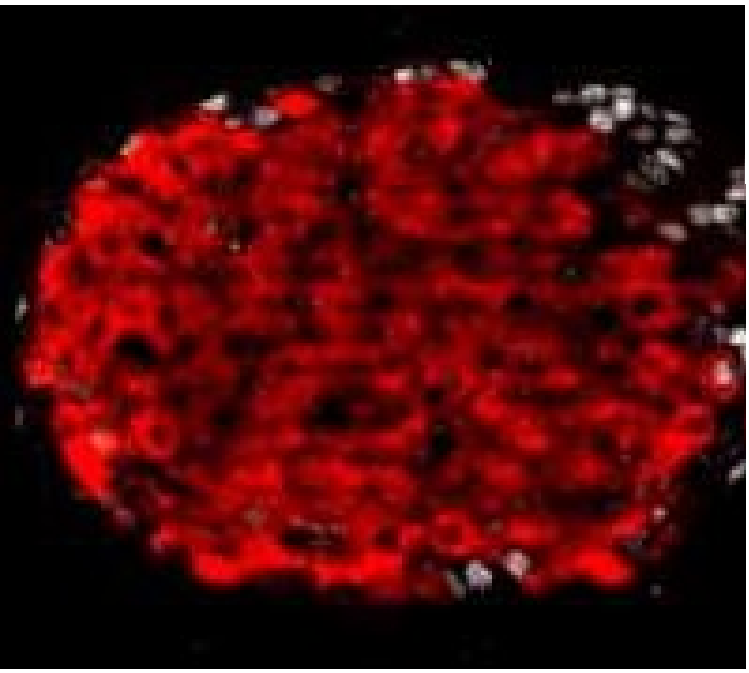
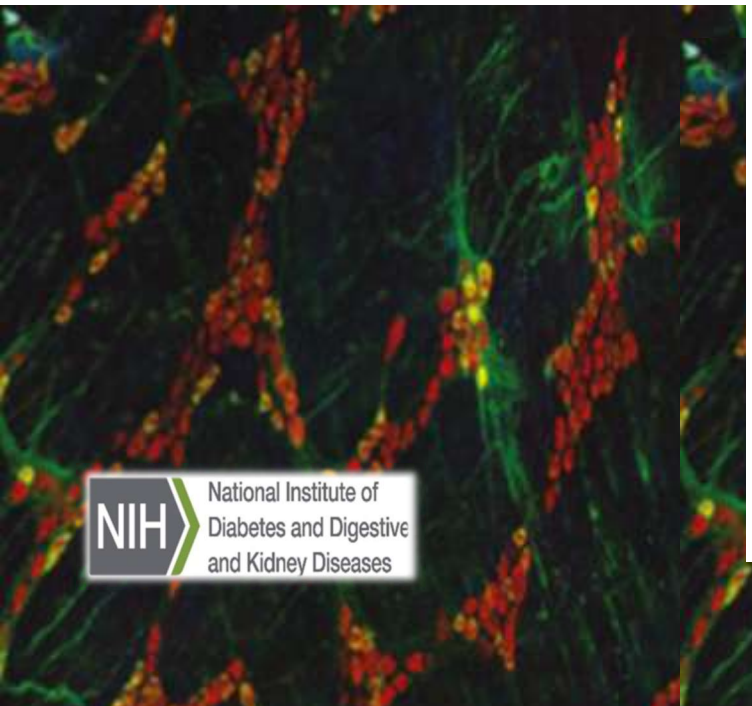
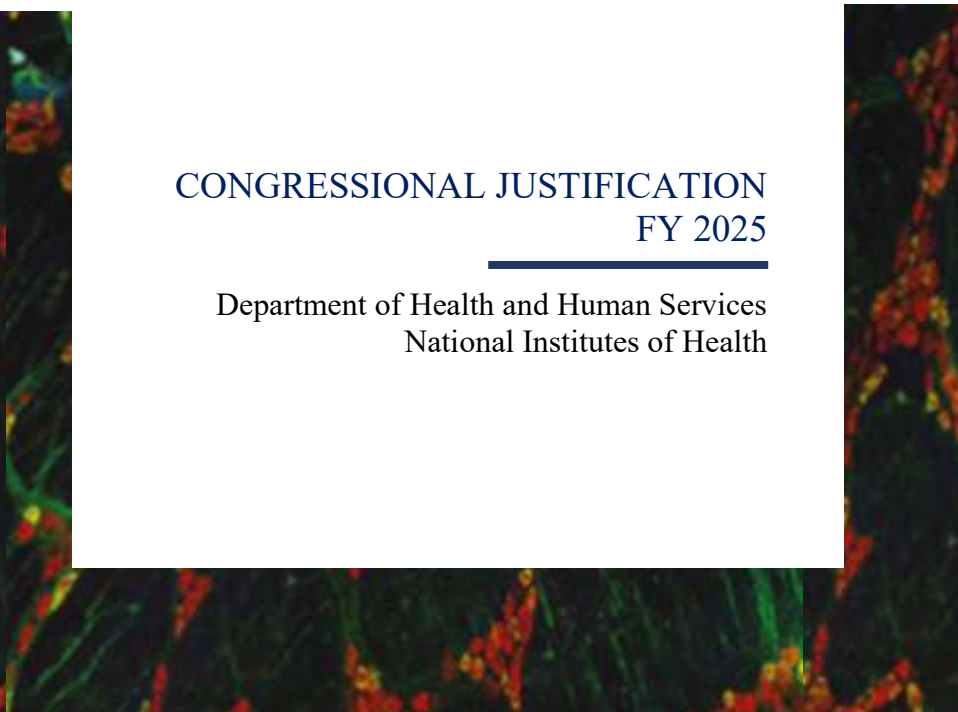


National Institute of Diabetes and Digestive and Kidney Diseases







CONGRESSIONAL JUSTIFICATION
FY 2025

Department of Health and Human Services
National Institutes of Health

NIH National Institute of Diabetes and Digestive and Kidney Diseases

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DEPARTMENT OF HEALTH AND HUMAN SERVICES

NATIONAL INSTITUTES OF HEALTH

National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)

FY 2025 Budget Table of Contents

General Notes

1. FY 2024 funding levels cited in this document are based on the Continuing Resolution in effect at the time of budget preparation (Public Law 118-35) and do not include HIV/AIDS transfers.
2. Detail in this document may not sum to the subtotals and totals due to rounding.

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GRIFFIN P. RODGERS, M.D., M.A.C.P.
DIRECTOR OF NIDDK

The mission of the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) is to support and conduct research to combat diabetes and other endocrine and metabolic diseases; liver and other digestive diseases; nutritional disorders; obesity; and kidney, urologic, and hematologic diseases. Our Institute's mission includes some of the most chronic, common, and costly diseases and conditions affecting the United States, as well as other conditions that are less widespread but still devastating. Many of these diseases and conditions place a disproportionate burden on populations with health disparities, such as ethnic and racial minority groups and underserved rural populations, underscoring the importance of pursuing research toward health equity. Diabetes affects an estimated 38.4 million people in the United States, greatly increasing the risk for many serious complications, such as heart disease and kidney failure.[1] Estimates of chronic kidney disease (CKD) show that about 35.5 million Americans are affected.[2] CKD, especially if undetected, can progress to irreversible kidney failure requiring dialysis or a kidney transplant. Many urologic diseases, such as urinary incontinence, urinary tract infections, and benign prostatic hyperplasia, are also highly prevalent.[3] Digestive diseases, which can cause serious complications ranging from severe pain to organ failure, account for an estimated 66.4 million ambulatory care visits (*e.g.*, to doctor's offices) and 16.7 million hospitalizations.[4] Nearly 42 percent of U.S. adults and nearly 20 percent of children and adolescents have obesity.[5] It is a strong risk factor for type 2 diabetes; fatty liver disease, including nonalcoholic steatohepatitis; and many other diseases. Cystic fibrosis and other genetic diseases within NIDDK's purview are less common, but still severe in their impacts. Building on emerging opportunities from past research investments, NIDDK will continue to support vigorous research to combat the diseases and disorders within our mission to improve health and save lives, guided by our Strategic Plan for Research[6] and the following priorities: maintain a vigorous investigator-initiated research portfolio, support pivotal clinical studies and trials, promote a steady and diverse pool of talented new investigators, foster exceptional research training and mentoring opportunities, and ensure knowledge dissemination through outreach and communications.

Addressing Health Disparities and Scientific Workforce Diversity in Pursuit of Health Equity

NIDDK has long supported innovative research to improve the health and quality of life of all people, including populations disproportionately burdened by our mission diseases. For example, our Centers for Diabetes Translation Research have advanced translational research

[1] cdc.gov/diabetes/data/statistics-report/index.html
[2] cdc.gov/kidneydisease/publications-resources/ckd-national-facts.html; usrds-adr.niddk.nih.gov/2023
[3] niddk.nih.gov/about-niddk/strategic-plans-reports/urologic-diseases-in-america
[4] cdc.gov/nchs/ahcd/index.htm; www.hcup-us.ahrq.gov/nisoverview.jsp
[5] cdc.gov/nchs/data/nhsr/nhsr158-508.pdf
[6] niddk.nih.gov/about-niddk/strategic-plans-reports/niddk-strategic-plan-for-research

that integrates evidence-based interventions into real-world settings for diverse populations, including contributing their expertise to recent research showing that taxes levied on sugar-sweetened beverages were associated with reduced maternal and birth complications, knowledge that could inform future policy decisions.[7] Exciting clinical trial results in type 1 diabetes showed that a novel bionic pancreas device, which automates insulin delivery in response to blood glucose (sugar) levels, improved blood glucose control in participants from racial and ethnic minority groups.[8] Scientists also identified new genetic risk factors for inflammatory bowel disease (IBD) in individuals from countries in East Asia, which can help us to understand and predict the disease.[9] NIDDK established a novel National Engagement Innovation Center to promote progress and advance equity in type 2 diabetes research, and supported new research to test interventions addressing structural racism to reduce kidney health disparities.[10] NIDDK is also forging novel partnerships with other government agencies to understand how social determinants of health (SDoH)—the conditions in which people are born, grow, work, live, and age—affect health outcomes. For example, NIDDK co-sponsored a workshop with the U.S. Department of Housing and Urban Development, the Centers for Disease Control and Prevention, and other NIH components to propel research on the intersection of housing insecurity and obesity-related health disparities. Relatedly, NIDDK plans to support research testing interventions that involve screening for and addressing adverse SDoH—such as food insecurity—during a health care visit.[11] Other major efforts are making paradigm-shifting progress in advancing health equity in kidney transplantation.[12] To improve public health and to promote health equity, the Institute also encourages research to study differences in health status across biological and social constructs of identity, and promotes NIDDK-relevant HIV research in diverse populations.[13]

NIDDK spearheads numerous research training and career development opportunities for people from diverse backgrounds, as we recognize that different perspectives are essential for addressing complex research areas. Examples include successful programs supporting activities to encourage high school students, undergraduate students, and junior faculty from diverse backgrounds to pursue research careers.[14] NIDDK also provides career development opportunities for scientists from diverse backgrounds to help them successfully compete for independent research funding, and participates in an NIH-wide program with similar goals.[15] We also support initiatives to attract new expertise to tackle our disease areas, such as a program for training and career development in kidney, urologic, and hematologic research, and other novel programs.[16]

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[7] Jackson KE, et al. Am J Prev Med 65: 366-376, 2023.
[8] Castellanos LE, et al. Diabetes Care 46: 1185-1190, 2023.
[9] Liu Z, et al. Nat Genet 55: 796-806, 2023.
[10] grants.nih.gov/grants/guide/rfa-files/rfa-dk-22-001.html; grants.nih.gov/grants/guide/rfa-files/RFA-DK-22-014.html
[11] grants.nih.gov/grants/guide/rfa-files/RFA-DK-22-038.html
[12] https://theapollonetwork.org/; https://classic.clinicaltrials.gov/ct2/show/NCT05014256
[13] grants.nih.gov/grants/guide/notice-files/NOT-DK-22-003.html; grants.nih.gov/grants/guide/notice-files/not-ai-23-046.html
[14] grants.nih.gov/grants/guide/rfa-files/rfa-dk-22-004.html; grants.nih.gov/grants/guide/rfa-files/rfa-dk-22-510.html
[15] grants.nih.gov/grants/guide/rfa-files/rfa-dk-22-002.html; grants.nih.gov/grants/guide/rfa-files/rfa-dk-20-034.html; grants.nih.gov/grants/guide/rfa-files/rfa-dk-22-012.html; grants.nih.gov/grants/guide/pa-files/PAR-21-271.html
[16] grants.nih.gov/grants/guide/pa-files/PAR-23-248.html; grants.nih.gov/grants/guide/rfa-files/rfa-dk-21-019.html; grants.nih.gov/grants/guide/rfa-files/rfa-dk-23-014.html; grants.nih.gov/grants/guide/rfa-files/RFA-DK-22-006.html

Future research and workforce efforts will be informed by *Pathways to Health for All*, a 2023 report from the Health Disparities and Health Equity Research Working Group of the NIDDK's Advisory Council.[17] The report makes innovative recommendations to advance research in health equity and health disparities, and includes guiding principles for embedding equity into research. Community engagement is a critical part of the report to help ensure that NIDDK research benefits *all* populations.

Research To Address the Lifetime Burden of Chronic Diseases

In FY 2025, NIDDK will continue our commitment to advancing research that can benefit people with chronic diseases across the lifespan and save lives. Building on past NIDDK-supported landmark research showing that type 2 diabetes is more aggressive and difficult to treat in youth than in adults, and because rates of type 2 diabetes in youth are increasing, we established a new consortium to conduct urgently needed research to inform novel prevention and treatment approaches for pediatric type 2 diabetes.[18] Obesity is a risk factor for type 2 diabetes and other chronic diseases, so NIDDK also supports research to prevent childhood obesity, such as research to characterize early-life risk factors.[19] Related to digestive diseases, a critical trial is seeking to understand what factors are important in determining whether a child with Crohn's disease completely heals after receiving therapy, while our Childhood Liver Disease Research Network is providing key insights about pediatric liver diseases.[20] NIDDK also plans to continue our Chronic Kidney Disease in Children Study Consortium that is shedding new light on the risk factors that lead to CKD in youth.[21]

NIDDK research also remains necessary for tackling emerging scientific areas and public health challenges that may worsen the already high burden that chronic diseases place on the United States. To address the urgent public health need related to the impact of COVID-19 on diabetes, NIDDK is supporting new research to establish and study a large, diverse cohort of children and adults who developed diabetes following SARS-CoV-2 infection.[22] In other research, scientists showed that people who experienced acute kidney injury (AKI) during a hospitalization—whether or not they had pre-existing kidney disease—were more likely to revisit the hospital or die shortly after discharge compared to people hospitalized without AKI. This finding underscores the importance of our Caring for OutPatiEnts after AKI (COPE-AKI) Consortium to develop and test interventions to save lives and improve clinical outcomes among people surviving an AKI episode.[23] Another consortium is addressing the increase in the global burden of CKD of uncertain or non-traditional etiologies, particularly in agricultural communities.[24] NIDDK also supports a consortium conducing key studies on chronic pancreatitis and factors that increase the risk of pancreatic cancer in children and adults with chronic pancreatitis, pancreatogenic diabetes, and newly diagnosed diabetes.[25]

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[17] niddk.nih.gov/about-niddk/strategic-plans-reports/pathways-health-all

[18] grants.nih.gov/grants/guide/rfa-files/rfa-dk-21-002.html; grants.nih.gov/grants/guide/rfa-files/RFA-DK-21-003.html

[19] grants.nih.gov/grants/guide/rfa-files/RFA-DK-21-025.html

[20] classic.clinicaltrials.gov/ct2/show/NCT05781152; childrennetwork.org/

[21] statepi.jhsph.edu/ckid/

[22] grants.nih.gov/grants/guide/rfa-files/RFA-DK-22-016.html

[23] Schulman IH, et al. Am J Kidney Dis 82: 63-74.e1, 2023; classic.clinicaltrials.gov/ct2/show/NCT05805709

[24] ckducureconsortium.org/

[25] dmscro.org/cpdpc

Supporting Innovative, Foundational Research Toward Developing Novel Prevention and Treatment Approaches

NIDDK research to advance foundational knowledge has enhanced our understanding of diseases, led to dramatic improvements in prevention and treatment, and saved lives. For example, NIDDK-supported research led to recent U.S. Food and Drug Administration (FDA) approvals of the first drug that can delay onset of clinical type 1 diabetes, the first cellular therapy to treat some adults with type 1 diabetes, and a new bionic pancreas system to manage type 1 diabetes.[26] NIDDK foundational research also made possible the first FDA-approved drug for pediatric type 2 diabetes since 2000.[27] In the future, NIDDK's research to tackle emerging areas of science is expected to continue to provide unprecedented new understanding toward preventing and treating disease. For example, recent research has advanced potential therapies for polycystic kidney disease, and a recently established network is poised to transform clinical care for liver cirrhosis.[28] An expanded focus on disease heterogeneity—why diseases can vary from person to person—is expected to usher in a new era of precision medicine. Already, breakthrough progress is being made. For example, Kidney Precision Medicine Project (KPMP) researchers created the most comprehensive atlas of the human kidney to date.[29] This atlas can be used to help distinguish distinct disease subtypes that are now collectively treated as AKI or chronic kidney disease, and to pave the way for more personalized treatments. Other future research, such as through our IBD Genetics Consortium and a new initiative to define type 2 diabetes subtypes, could lead to significant progress on understanding disease heterogeneity.[30]

NIDDK has invested resources in recent fiscal years by supporting research programs with the potential to yield transformative results in understanding, preventing, and treating disease. For example, NIDDK has supported the Rare and Atypical Diabetes NeTwork (RADIANT) to provide key insights not only into rare forms of diabetes, but also into the heterogeneity of type 2 diabetes.[31] We also began a major clinical trial to test the effectiveness of novel gluten detection technologies, in addition to telemedicine, to manage celiac disease in adults newly diagnosed with the disease.[32] Additionally, NIDDK supported new research that aims to foster community-engaged intervention research to address structural racism and reduce health disparities among individuals living with kidney disease.[33] With additional funds for pain management research in FY 2023, NIDDK bolstered our pain-related research, including through the support of novel basic, translational, and clinical efforts to develop new approaches to assess and treat pain for disorders within the Institute's mission.[34] Such research is expected to provide essential new insights into the pathophysiology and clinical features of pain and foster improved treatment and

[26] fda.gov/news-events/press-announcements/fda-approves-first-drug-can-delay-onset-type-1-diabetes; fda.gov/news-events/press-announcements/fda-approves-first-cellular-therapy-treat-patients-type-1-diabetes; fda.gov/news-events/press-announcements/fda-clears-new-insulin-pump-and-algorithm-based-software-support-enhanced-automatic-insulin-delivery

[27] fda.gov/news-events/press-announcements/fda-approves-new-class-medicines-treat-pediatric-type-2-diabetes

[28] Onuchic L, et al. Nat Commun 14: 1790, 2023; www.lcnstudy.org/

[29] Lake BB, et al. Nature 619: 585-594, 2023.

[30] ibdgenetics.org/; grants.nih.gov/grants/guide/rfa-files/rfa-dk-23-019.html

[31] grants.nih.gov/grants/guide/rfa-files/rfa-dk-22-511.html

[32] reporter.nih.gov/project-details/10718458

[33] grants.nih.gov/grants/guide/rfa-files/RFA-DK-22-014.html

[34] grants.nih.gov/grants/guide/rfa-files/rfa-dk-23-006.html

pain management strategies. NIDDK will continue to be guided by our recent Strategic Plan for Research to accelerate research progress and improve the health of all people affected by diseases and conditions within our mission.

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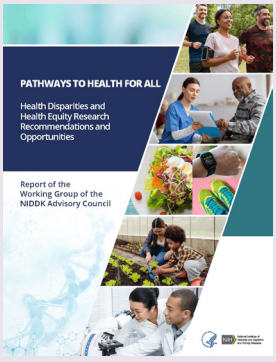
NATIONAL INSTITUTE OF DIABETES AND DIGESTIVE AND KIDNEY DISEASES

Introduction to NIDDK Research

Established in 1950, NIDDK supports and conducts research on some of the most chronic, common, and costly conditions, including diabetes and other endocrine and metabolic diseases, liver and other digestive diseases, obesity, kidney diseases, urologic diseases, and hematologic (blood) diseases. The Diabetes, Endocrinology, and Metabolic Diseases program; the Digestive Diseases and Nutrition program; the Kidney, Urologic, and Hematologic Diseases program; and the NIDDK Intramural Research Program support basic, clinical, and translational research across the United States. NIDDK also supports research training and career development, as well as outreach efforts to patients, healthcare providers, and the public.

Pathways to Health for All: Health Disparities & Health Equity Research Recommendations & Opportunities

Released in May 2023, a new report from the Health Disparities and Health Equity Research Working Group of the NIDDK Advisory Council makes innovative recommendations to advance NIDDK's health equity and health disparities research programs. It also includes guiding principles for embedding equity into research and tips for researchers, at NIDDK and externally, who plan to engage in robust health equity research.



niddk.nih.gov/about-niddk/strategic-plans-reports/

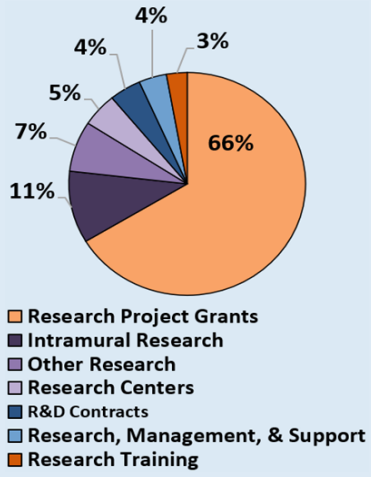
Griffin P. Rodgers, M.D., M.A.C.P.

Dr. Rodgers has been Director of NIDDK since 2007 and served as Deputy Director since 2001. As a leading hematology investigator, he is widely recognized for his contributions to the development of the first effective —and FDA-approved— therapy for sickle cell anemia.

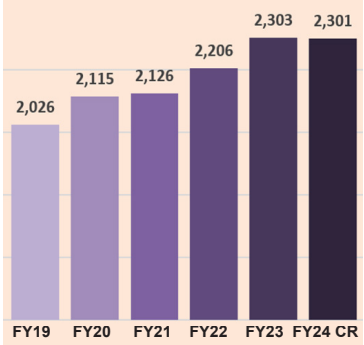
Recent NIDDK Research Highlights

- Decades of NIDDK-supported research led to FDA approval of the first drug that delays clinical type 1 diabetes onset in individuals at high risk for developing the disease and the first cellular therapy for some adults with type 1 diabetes.
- NIDDK foundational research made possible the first FDA-approved oral medication for type 2 diabetes in children 10 years and older, expanding treatment options for pediatric type 2 diabetes.
- The Kidney Precision Medicine Project created a new "kidney atlas" that compares healthy versus injured human kidney tissue, laying a critical foundation for discovering new treatments.
- A recent clinical trial demonstrated that a diet rich in fiber and low in processed foods may have benefits for human health by nurturing the gut microbiome.
- Scientists uncovered biological links between psychological stress and inflammatory bowel disease flare-ups.

FY 2023 Funding Support



Funding History*



FY 2025 President's Budget Request (in millions): $2,310

*excludes mandatory T1D funding

Selected Current Activities

- NIDDK is supporting a national network of research institutions and community-based organizations to strengthen the engagement of communities and individuals from diverse backgrounds and enhance equity in type 2 diabetes research.
- A new consortium is characterizing a large cohort of youth at risk for type 2 diabetes through puberty to identify factors that contribute to youth-onset type 2 diabetes.
- The System Interventions to Achieve Early and Equitable Transplants Study (STEPS) is identifying people in need of a kidney transplant and determining whether outreach strategies focused on equity and patient needs can improve access to living donor kidney transplants.
- A multi-center study of people who developed diabetes after COVID-19 infection is investigating the clinical course and physiological processes underlying post-COVID-19 diabetes.
- A consortium for Chronic Pancreatitis, Diabetes and Pancreatic Cancer (CPDPC) is conducting a comprehensive study of individuals with chronic pancreatitis to gain insights that could pave the way for developing new treatments for the disease.

NIDDK at a Glance

2023 Research Project Grants*
Funded Principal Investigators: **929**
Competing Applications Awarded: **706**

*excludes mandatory T1D funding

Number of Full Time Employees: 670
4-year average, FY 2020-2023

2023 Paylines and Early Stage Investigators (ESIs*)
R01 Payline: **16%**
ESI Payline: **25%**
ESI Renewal Payline: **19%**
Number of ESIs: **90**

*excludes new investigators who are not ESIs

NIDDK Recent Advances and Emerging Opportunities

NIDDK Recent Advances and Emerging Opportunities is an annual compendium that highlights recent advances from NIDDK-supported studies, along with personal stories of people who have given time and effort to participate in NIDDK-sponsored clinical research.

niddk.nih.gov/about-niddk/strategic-plans-reports

Selected Recent Accomplishments

- Recent clinical trials testing artificial pancreas technologies for type 1 diabetes management led to the FDA approval of a new bionic pancreas device in people ages 6 and older and showed that another device (Control IQ) was effective in children between ages 2 and 5.
- Using a 3D model of the kidney, researchers discovered that sugar can promote cyst growth in polycystic kidney disease (PKD), pointing to sugar uptake inhibitors as a potential treatment.
- Studies in people who do shift work and in mice showed that time-restricted eating can lead to health benefits, improving our understanding of how meal timing can affect metabolic health.
- New findings provided insights into different types of overactive bladder urinary symptoms, which may help identify more targeted treatment approaches.
- Researchers found that an FDA mandate limiting the acetaminophen levels in combination acetaminophen-opioid pain relievers was associated with a decreased incidence of liver failure and hospitalization due to these medications.

Selected Future Research Initiatives

- NIDDK will support further research on reducing disparities and achieving health equity in diseases within the NIDDK mission that disproportionately affect underserved populations.
- A new randomized controlled trial will evaluate novel gluten detection technologies to improve celiac disease management in newly diagnosed adults.
- The Gut-Brain Communication in Parkinson's Disease Consortium (GBPDC) will accelerate research on the role of gastrointestinal symptoms and gut-brain communication in Parkinson's disease to help develop novel diagnostic tools and biomarkers for Parkinson's disease.
- A new consortium will develop community-engaged interventions that dismantle the effects of structural racism to reduce health disparities among people living with kidney disease.
- A Working Group of NIDDK's Advisory Council on diabetes heterogeneity will identify research gaps and inform future opportunities, and a multi-disciplinary consortium will aim to discover new, more precise measures to classify subtypes of type 2 diabetes.

Major Changes in the Fiscal Year 2025 President's Budget Request

Major changes by budget mechanism and/or budget activity detail are briefly described below. Note that there may be overlap between budget mechanisms and activity detail and these highlights will not sum to the total change for the FY 2025 President's Budget. The FY 2025 President's Budget request for the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), excluding the proposed $260.0 million of mandatory funding for Type 1 Diabetes, is $2,310.0 million, an increase of $6.9 million compared to the FY 2023 Final level. The FY 2025 President's Budget reflects the Administration's fiscal policy goals for the Federal Government. Within that framework, NIDDK will pursue its highest research priorities through strategic investments and careful stewardship of appropriated funds.

Research Project Grants (RPGs) (-$1.1 million; total $1,527.7 million): NIDDK will increase funding for non-competing RPGs by $19.3 million compared to the FY 2023 Final level. Non-competing awards include a decrease of 2.0 percent from their full commitment level. Funding for competing RPGs is expected to decrease by $17.4 million, or 4.8 percent, relative to the FY 2023 Final level, resulting in 33 fewer grants compared to the FY 2023 Final level of 706 awards. These changes in funding are distributed across all programmatic areas and basic, translational, or clinical research.

Research Centers (+$0.8 million; total $113.0 million): NIDDK will increase funding for Research Centers by 0.7 percent compared to the FY 2023 Final level. This increase is distributed across all programmatic areas and basic, translational, or clinical research.

Other Research (-$8.9 million; total $159.9 million): NIDDK will decrease funding for Other Research by 5.3 percent compared to the FY 2023 Final level. These decreases are distributed across all programmatic areas and basic, translational, or clinical research.

Research & Development (R&D) Contracts (+$4.1 million; total $104.0 million): NIDDK will increase funding for R&D Contracts by 4.1 percent compared to the FY 2023 Final level. These increases are distributed across all programmatic areas and basic, translational, or clinical research.

Intramural Research (+$8.1 million; total $248.8 million): NIDDK will increase funding for Intramural Research by 3.4 percent compared to the FY 2023 Final level. These increases will cover pay raises for intramural researchers and other inflationary costs, and are distributed across all programmatic areas and basic, translational or clinical research.

Research Management and Support (+$3.3 million; total $90.9 million): NIDDK will increase funding for Research, Management, and Support by 3.7 percent compared to the FY 2023 Final level. These increases will cover pay raises for RMS staff and other inflationary costs and are distributed across all administrative support areas of basic, translational, or clinical research.

NATIONAL INSTITUTES OF HEALTH

National Institute of Diabetes and Digestive and Kidney Diseases

Budget Mechanism[*,1]

(Dollars in Thousands)

Mechanism	FY 2023 Final		FY 2024 CR		FY 2025 President's Budget		FY 2025 +/- FY 2023	
	Number	Amount	Number	Amount	Number	Amount	Number	Amount
Research Projects:								
Noncompeting	2,092	$1,076,607	2,082	$1,093,644	1,998	$1,095,929	-94	$19,322
Administrative Supplements	*(135)*	$15,026	*(117)*	$13,000	*(117)*	$13,000	*-(18)*	-$2,026
Competing:								
Renewal	156	$80,583	155	$80,068	159	$81,941	3	$1,358
New	549	$284,663	504	$261,118	513	$265,823	-36	-$18,840
Supplements	1	$466	1	$500	1	$500	0	$34
Subtotal, Competing	**706**	**$365,712**	**660**	**$341,686**	**673**	**$348,264**	**-33**	**-$17,448**
Subtotal, RPGs	2,798	$1,457,345	2,742	$1,448,330	2,671	$1,457,193	-127	-$152
SBIR/STTR	99	$71,542	97	$70,380	98	$70,550	-1	-$992
Research Project Grants	2,897	$1,528,887	2,839	$1,518,710	2,769	$1,527,743	-128	-$1,144
Research Centers								
Specialized/Comprehensive	87	$112,167	88	$112,950	88	$112,950	1	$783
Clinical Research	0	$0	0	$0	0	$0	0	$0
Biotechnology	0	$0	0	$0	0	$0	0	$0
Comparative Medicine	0	$50	0	$50	0	$50	0	$0
Research Centers in Minority Institutions	0	$0	0	$0	0	$0	0	$0
Research Centers	**87**	**$112,217**	**88**	**$113,000**	**88**	**$113,000**	**1**	**$783**
Other Research:								
Research Careers	493	$88,622	500	$89,000	500	$89,000	7	$378
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	$109	0	$1,000	0	$1,000	0	$891
Other	126	$80,066	124	$76,606	98	$69,933	-28	-$10,133
Other Research	**619**	**$168,796**	**624**	**$166,606**	**598**	**$159,933**	**-21**	**-$8,863**
Total Research Grants	3,603	$1,809,900	3,551	$1,798,316	3,455	$1,800,676	-148	-$9,224
Ruth L Kirschstein Training Awards:	FTTPs		FTTPs		FTTPs		FTTPs	
Individual Awards	288	$14,135	290	$14,135	290	$14,276	2	$141
Institutional Awards	751	$50,923	751	$50,923	751	$51,432	0	$509
Total Research Training	**1,039**	**$65,058**	**1,041**	**$65,058**	**1,041**	**$65,708**	**2**	**$650**
Research & Develop. Contracts	113	$99,833	114	$104,376	114	$103,976	1	$4,143
SBIR/STTR (non-add)	*(3)*	*($823)*	*(3)*	*($875)*	*(3)*	*($875)*	*(0)*	*($52)*
Intramural Research	388	$240,684	438	$243,875	438	$248,753	50	$8,069
Res. Management & Support	310	$87,622	318	$89,096	318	$90,878	8	$3,256
SBIR Admin. (non-add)		*($8)*		*($10)*		*($10)*		*($2)*
Total, NIDDK	**698**	**$2,303,098**	**756**	**$2,300,721**	**756**	**$2,309,991**	**58**	**$6,893**

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

[1] All Subtotal and Total numbers may not add due to rounding.

NATIONAL INSTITUTES OF HEALTH

Type 1 Diabetes

Budget Mechanism [*,1]

(Dollars in Thousands)

Mechanism	FY 2023 Final [2,3]		FY 2024 CR		FY 2025 President's Budget		FY 2025 +/- FY 2023	
	Number	Amount	Number	Amount	Number	Amount	Number	Amount
Research Projects:								
Noncompeting	109	$123,969	177	$160,000	180	$162,260	71	$38,291
Administrative Supplements	*(0)*	$0	*(14)*	$15,000	*(14)*	$15,000	*(14)*	$15,000
Competing:								
Renewal	0	$0	0	$0	0	$0	0	$0
New	5	$4,319	86	$63,875	95	$71,250	90	$66,931
Supplements	0	$0	0	$0	0	$0	0	$0
Subtotal, Competing	**5**	**$4,319**	**86**	**$63,875**	**95**	**$71,250**	**90**	**$66,931**
Subtotal, RPGs	114	$128,288	263	$238,875	275	$248,510	161	$120,222
SBIR/STTR	13	$5,163	21	$9,125	22	$9,490	9	$4,327
Research Project Grants	127	$133,451	284	$248,000	297	$258,000	170	$124,549
Research Centers								
Specialized/Comprehensive	0	$0	0	$0	0	$0	0	$0
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	**0**	**$0**	**0**	**$0**	**0**	**$0**	**0**	**$0**
Other Research:								
Research Careers	2	$2,999	0	$0	0	$0	-2	-$2,999
Cancer Education	0	$0	0	$0	0	$0	0	$0
Cooperative Clinical Research	0	$2,000	0	$2,000	0	$2,000	0	$0
Biomedical Research Support	0	$0	0	$0	0	$0	0	$0
Minority Biomedical Research Support	0	$0	0	$0	0	$0	0	$0
Other	1	$3,000	0	$0	0	$0	-1	-$3,000
Other Research	**3**	**$7,999**	**0**	**$2,000**	**0**	**$2,000**	**-3**	**-$5,999**
Total Research Grants, T1D	**130**	**$141,450**	**284**	**$250,000**	**297**	**$260,000**	**167**	**$118,550**

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

[1] Figures reflect budget authority provided in each year. A portion of this budget authority will be carried over and obligated in later years.

[2] Includes mandatory Type 1 Diabetes funding not obligated in FY 2023 and carried over into FY 2024.

[3] FY 2023 total reflects budget authority (in thousands) of $150,000 reduced by $8,550 for Budget Control Act sequestration.

NATIONAL INSTITUTES OF HEALTH

NATIONAL INSTITUTE OF DIABETES AND DIGESTIVE AND KIDNEY DISEASES

For carrying out section 301 and title IV of the PHS Act with respect to diabetes and digestive and kidney disease, $2,309,991,000.

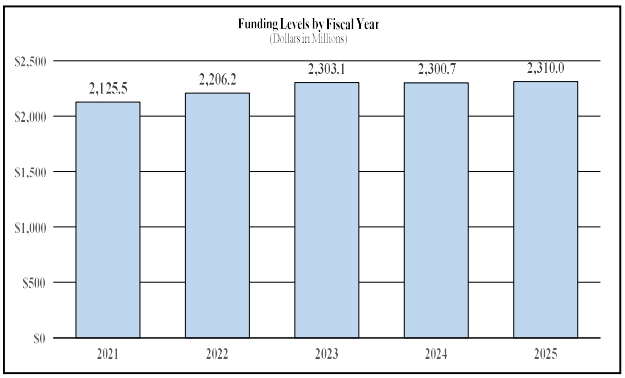
NATIONAL INSTITUTES OF HEALTH
National Institute of Diabetes and Digestive and Kidney Diseases

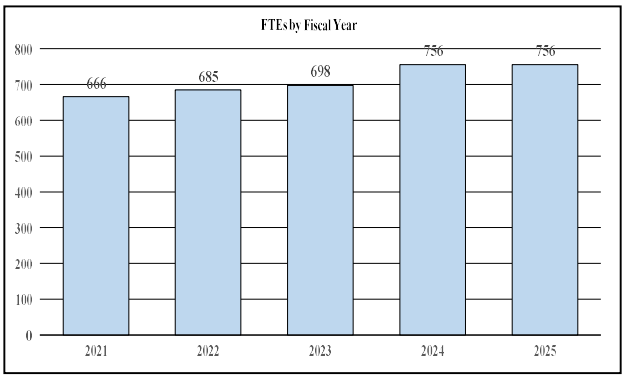
Summary of Changes
(Dollars in Thousands)

CHANGES	FY 2023 Final FTEs	FY 2023 Final Budget Authority	FY 2025 President's Budget FTEs	FY 2025 President's Budget Budget Authority	Built-In Change from FY 2023 Final FTEs	Built-In Change from FY 2023 Final Budget Authority
1. Intramural Research:						
A. Built-in cost changes:						
a. FY 2024 effect of FY 2023 pay & benefits increase		$97,459		$118,221		$1,509
b. FY 2024 effect of FY 2024 pay & benefits increase		$97,459		$118,221		$4,828
c. FY 2024 paid days adjustment		$97,459		$118,221		$395
d. Differences attributable to FY 2024 change in FTE		$97,459		$118,221		$9,610
e. FY 2025 effect of FY 2024 pay & benefits increase		$97,459		$118,221		$1,810
f. FY 2025 effect of FY 2025 pay & benefits increase		$97,459		$118,221		$1,911
g. FY 2025 paid days adjustment		$97,459		$118,221		$0
h. Differences attributable to FY 2025 change in FTE		$97,459		$118,221		$0
i. Payment for centrally furnished services		$36,853		$39,516		$2,663
j. Cost of laboratory supplies, materials, other expenses, and non-recurring costs		$106,301		$91,016		$8,504
Subtotal, IR built-in cost changes						$31,229
2. Research Management and Support:						
A. Built-in cost changes:						
a. FY 2024 effect of FY 2023 pay & benefits increase		$57,979		$65,386		$843
b. FY 2024 effect of FY 2024 pay & benefits increase		$57,979		$65,386		$2,699
c. FY 2024 paid days adjustment		$57,979		$65,386		$251
d. Differences attributable to FY 2024 change in FTE		$57,979		$65,386		$1,533
e. FY 2025 effect of FY 2024 pay & benefits increase		$57,979		$65,386		$1,012
f. FY 2025 effect of FY 2025 pay & benefits increase		$57,979		$65,386		$1,068
g. FY 2025 paid days adjustment		$57,979		$65,386		$0
h. Differences attributable to FY 2025 change in FTE		$57,979		$65,386		$0
i. Payment for centrally furnished services		$41		$44		$3
j. Cost of laboratory supplies, materials, other expenses, and non-recurring costs		$29,532		$25,448		$1,673
Subtotal, RMS built-in cost changes						$9,082

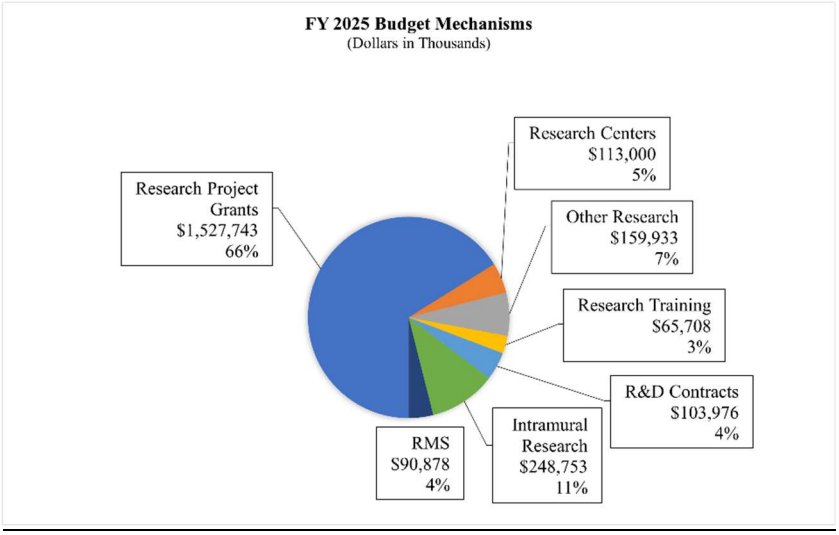
CHANGES	FY 2023 Final No.	FY 2023 Final Amount	FY 2025 President's Budget No.	FY 2025 President's Budget Amount	Program Change from FY 2023 Final No.	Program Change from FY 2023 Final Amount
B. Program:						
1. Research Project Grants:						
a. Noncompeting	2,092	$1,091,633	1,998	$1,108,929	-94	$17,296
b. Competing	706	$365,712	673	$348,264	-33	-$17,448
c. SBIR/STTR	99	$71,542	98	$70,550	-1	-$992
Subtotal, RPGs	2,897	$1,528,887	2,769	$1,527,743	-128	-$1,144
2. Research Centers	87	$112,217	88	$113,000	1	$783
3. Other Research	619	$168,796	598	$159,933	-21	-$8,863
4. Research Training	1,039	$65,058	1,041	$65,708	2	$650
5. Research and development contracts	113	$99,833	114	$103,976	1	$4,143
Subtotal, Extramural		$1,974,791		$1,970,360		-$4,431
6. Intramural Research	388	$240,684	438	$248,753	50	-$23,161
7. Research Management and Support	310	$87,622	318	$90,878	8	-$5,826
Subtotal, program changes						-$33,418
Total built-in and program changes	698	$2,303,098	756	$2,309,991	58	$6,893

History of Budget Authority and FTEs:

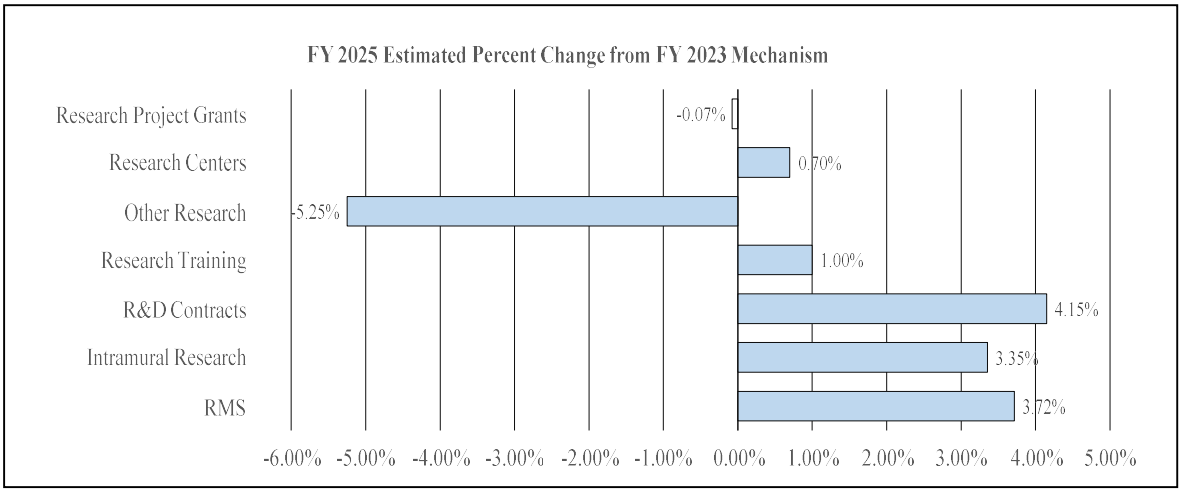




Distribution by Mechanism:



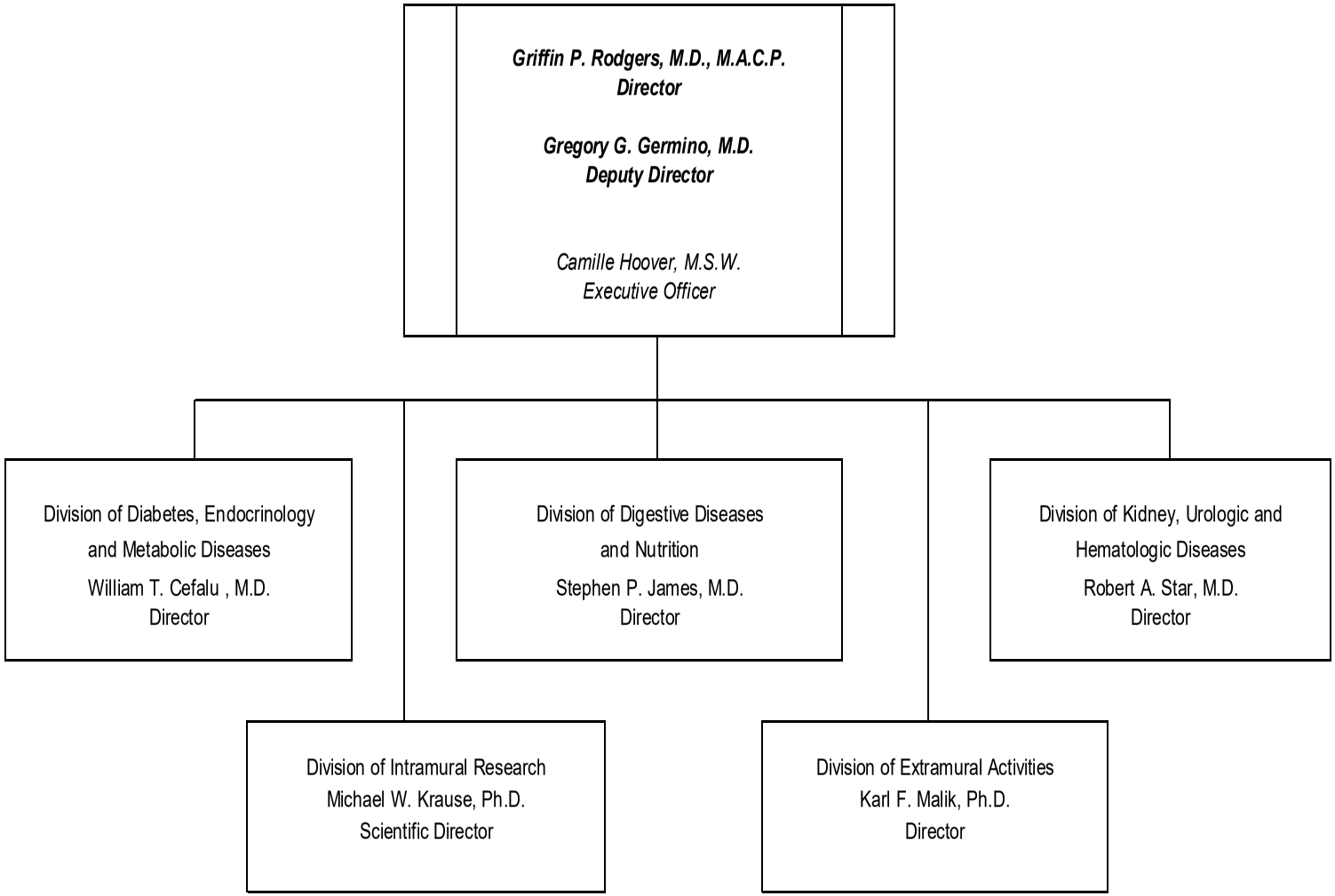
Change by Selected Mechanisms:



NATIONAL INSTITUTES OF HEALTH

National Institute of Diabetes and Digestive and Kidney Diseases

Organization Structure



NATIONAL INSTITUTES OF HEALTH
National Institute of Diabetes and Digestive and Kidney Diseases

Budget Authority by Activity *
(Dollars in Thousands)

	FY 2023 Final		FY 2024 CR		FY 2025 President's Budget		FY 2025 +/- FY 2023 Final	
Extramural Research	**FTE**	**Amount**	**FTE**	**Amount**	**FTE**	**Amount**	**FTE**	**Amount**
Detail								
Diabetes, Endocrinology, and Metabolic Diseases		$694,314		$722,171		$723,128		$28,814
Digestive Diseases and Nutrition		$724,755		$691,838		$692,756		-$31,999
Kidney, Urologic, and Hematologic Diseases		$555,723		$553,741		$554,476		-$1,247
(Type 1 Diabetes (mandatory funding)) [1]		*($141,450)*		*($250,000)*		*($260,000)*		*($118,550)*
Subtotal, Extramural		**$1,974,791**		**$1,967,750**		**$1,970,360**		**-$4,431**
Intramural Research	**388**	**$240,684**	**438**	**$243,875**	**438**	**$248,753**	**50**	**$8,069**
Research Management & Support	**310**	**$87,622**	**318**	**$89,096**	**318**	**$90,878**	**8**	**$3,256**
TOTAL	**698**	**$2,303,098**	**756**	**$2,300,721**	**756**	**$2,309,991**	**58**	**$6,893**

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

[1] Type 1 Diabetes FY 2023 amount reflects budget authority (in thousands) of $150,000 reduced by $8,550 for Budget Control Act sequestration.

National Institute of Diabetes and Digestive and Kidney Diseases

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

Budget Authority (BA):

	FY 2023 Final	FY 2024 CR	FY 2025 President's Budget	FY 2025 +/- FY 2023
BA	$2,444,548,000	$2,550,721,000	$2,569,991,000	$125,443,000
Type 1 Diabetes Mandatory:[35]				
Current law	-$141,450,000	-$150,000,000	$0	$141,450,000
Proposal	$0	-$100,000,000	-$260,000,000	-$260,000,000
Total	-$141,450,000	-$250,000,000	-$260,000,000	-$118,550,000
Labor/HHS	$2,303,098,000	$2,300,721,000	$2,309,991,000	$6,893,000
FTE	698	756	756	58

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

Overall Budget Policy: The FY 2025 President's Budget request is $2,310.0 million, excluding mandatory Type 1 Diabetes funding, an increase of $6.9 million from the FY 2023 Final level. This funding level will support basic, translational, and clinical research across all of NIDDK's mission areas, as described below. The Budget proposes to reauthorize the Special Type 1 Diabetes Program through FY 2026, providing $250.0 million in FY 2024, $260.0 million in FY 2025, and $270.0 million in FY 2026.

Program Descriptions

Diabetes, Endocrinology, and Metabolic Diseases

The objectives of this program are to enhance the understanding of diabetes and other endocrine and metabolic disorders, and to develop and test prevention and treatment strategies. It supports basic, clinical, and translational research, as well as research training, in areas that include type 1, type 2, and gestational diabetes; cystic fibrosis; obesity; energy balance; and endocrinology.

[35] Type 1 Diabetes FY 2023 amount reflects budget authority of $150,000,000 reduced by $8,550,000 for Budget Control Act sequestration. Current law amount for FY 2024 reflects annualized CR level.

In FY 2025, NIDDK will continue to support foundational research that may lead to better ways to treat and prevent endocrine and metabolic diseases, such as diabetes and obesity. Recent discoveries include findings from a study in mice and in human cells that shed light on how insulin-producing beta cells in the pancreas adapt insulin secretion to the body's needs, and how type 2 diabetes may disrupt this process.[36] Future research on this pathway of insulin regulation may lead to new approaches for diabetes treatment. In other research, scientists are making significant strides in understanding the link between time-restricted eating and metabolic diseases. For example, a study in mice revealed a biological mechanism involving the molecule creatine that may explain why eating late at night is linked to weight gain and metabolic disease.[37] Relatedly, scientists discovered that, in mice, gastric bypass surgery (a treatment for severe obesity) reprograms the biological day/night "clock" to adjust the timing and amount of food consumption and improve glucose metabolism.[38] Scientists have also gained important new insights on the metabolic benefits of exercise, including discoveries in mice of a novel connection between the gut microbiome and the brain that influences the motivation to exercise, as well as the identification of proteins secreted into the bloodstream that play a key role in mediating the health benefits of exercise.[39] These exciting molecular insights can inform future new prevention and treatment approaches for obesity, diabetes, and other metabolic diseases.

With FY 2025 resources, NIDDK will continue major clinical and translational research studies in diabetes, endocrinology, and metabolic diseases toward improving health and saving lives. Recent progress includes findings from a study to improve the health of people who do shift work, which showed that time-restricted eating was feasible for firefighters on 24-hour shift work and led to

Diabetes Research Centers

The year 2023 marked the 50th anniversary of the NIDDK's Diabetes Research Centers (DRCs) that have transformed the field of diabetes research.[1] The DRCs are part of an integrated program of diabetes and related endocrinology and metabolism research. Toward the goal of developing new methods to treat, prevent, and cure diabetes and its complications, the DRCs support research institutions with an established existing base of high-quality, diabetes-related research; provide increased, cost-effective collaboration among multidisciplinary groups of scientists; and provide shared access to specialized technical resources and expertise. The DRCs are structured around an administrative core with an enrichment program, biomedical research cores, and a pilot and feasibility (P&F) program to encourage early-stage investigators and researchers new to diabetes. One historical, seminal accomplishment of the DRCs is their contribution to NIDDK's landmark Diabetes Control and Complications Trial (DCCT) that launched in 1983. DCCT, along with its follow-up study, called the Epidemiology of Diabetes Interventions and Complications (EDIC), showed that early and intensive blood glucose control lowered the risk for type 1 diabetes complications. These results transformed the way type 1 diabetes is managed, and researchers continue to learn from DCCT/EDIC participants today. More recently, the DRCs have contributed knowledge to a variety of areas, including revealing how time-restricted feeding can mitigate obesity in mice, identifying risk factors for diabetic nerve disease in DCCT/EDIC participants, and discovering changes that occur at the molecular level following acute physical activity.[2] Looking to the future, NIDDK plans to enhance the already strong DRCs by incorporating new areas of science, increasing synergy and better leveraging resources across the DRCs and with other NIDDK Centers and programs, strengthening the P&F program, and attracting new and diverse investigators. Building on their impressive accomplishments, the DRCs will continue to advance and evolve as new opportunities emerge to meet the needs of the diabetes research community.

[1] https://diabetescenters.org/
[2] Hepler C, et al. Science 378: 276-284, 2022; Braffett BH, et al. Diabetes 69: 1000-1010, 2020; Contrepois K, et al. Cell 181: 1112-1130.e16, 2020.

[36] Wortham M, et al. J Clin Invest 133: e165208, 2023.
[37] Hepler C, et al. Science 378: 276-284, 2022.
[38] Ye Y, et al. JCI Insight 8: e166618, 2023.
[39] Dohnalová L, et al. Nature 612, 739-747, 2022; Wei W, et al. Cell Metab 35: 1261-1279.e11, 2023.

health benefits for those with cardiometabolic risks.[40] Another study with key clinical implications showed that treating the genetic disorder Pompe disease *in utero* halted prenatal organ damage and improved health after birth, paving the way for future studies for this lysosomal storage disease that can be fatal by early childhood.[41] Other research showed that behavioral weight loss programs that are customized based on the individual's progress can improve weight loss results in adults and may help reduce the risk of type 2 diabetes more effectively than a one-size-fits-all intervention.[42] Toward developing future precision medicine approaches, NIDDK plans to bolster research on the heterogeneity of diabetes. The Institute plans to continue RADIANT (described in the Director's Overview above) and to stimulate new research to discover novel measures for subtypes of type 2 diabetes, which could help determine the most effective treatment based on the subtype.[43] Future research will also be informed by a new working group of NIDDK's Advisory Council focused on diabetes heterogeneity.

Budget Policy: The FY 2025 President's Budget request for this program is $723.1 million, an increase of $28.8 million or 4.1 percent compared with the FY 2023 Final level. With FY 2025 resources, NIDDK will continue major diabetes clinical trials. NIDDK will also continue supporting a study to improve gestational diabetes screening and diagnosis by better understanding blood glucose levels throughout pregnancy; research on the pathophysiology and clinical course of new-onset diabetes following SARS-CoV-2 infection; the Diabetic Foot Consortium to improve diabetic foot ulcer healing and prevent amputations; a National Engagement Innovation Center to advance health equity in type 2 diabetes research; and research on type 2 diabetes and youth.[44] NIDDK will also continue funding research centers to advance basic and clinical research relevant to diabetes and to cystic fibrosis and other genetic metabolic diseases. The Institute will also continue research to translate study findings for diverse populations and support health information dissemination activities to bring scientific discoveries in diabetes and obesity to real-world medical practice and other community settings, along with other efforts as part of an overall balanced research program.

Digestive Diseases and Nutrition

The objectives of this program are to enhance understanding of gastrointestinal, liver, and pancreatic diseases, nutrition, and obesity, and to develop and test strategies for disease prevention and treatment. This program supports basic, clinical, and translational research, as well as research training; fundamental studies of the digestive system; disease-targeted research involving the esophagus, stomach, small intestine, large intestine and anorectum, liver and biliary system, and pancreas; studies relevant to nutrition; and research on obesity.

In FY 2025, NIDDK will continue to support critical research aimed at combating diseases associated with the digestive system. Recent discoveries include the identification of biological pathways that link stress to worsening inflammatory bowel disease (IBD) symptoms, suggesting

[40] Manoogian ENC, et al. Cell Metab 34: 1442-1456.e7, 2022.
[41] Cohen JL, et al. N Engl J Med 387: 2150-2158, 2022.
[42] Miller CK, et al. Diabetes Care 45: 2452-2455, 2022.
[43] atypicaldiabetesnetwork.org/; grants.nih.gov/grants/guide/rfa-files/rfa-dk-23-019.html
[44] gomomsstudy.org/; grants.nih.gov/grants/guide/rfa-files/RFA-DK-22-016.html; diabeticfootconsortium.org/; grants.nih.gov/grants/guide/rfa-files/rfa-dk-22-001.html; grants.nih.gov/grants/guide/rfa-files/rfa-dk-21-002.html

that strategies to reduce stress could be an important component of IBD treatment.[45] These findings may also benefit those with other gut inflammatory diseases and other diseases that are worsened by stress. In other research, scientists discovered that SARS-CoV-2 infection disrupted the gut microbiome, which enabled secondary bloodstream infections.[46] This knowledge could help doctors better identify those with COVID-19 who are most at risk of a secondary infection. Additional molecular insights are expected to emerge from a planned new consortium to investigate the role of the gut in the causes and progression of Parkinson's Disease.[47] Because research shows that gut health significantly impacts the brain's form and function, research in this area may also benefit other neurodegenerative disorders.

Related to research on liver diseases, scientists found that a Food and Drug Administration (FDA) mandate limiting the amount of acetaminophen in combination opioid-acetaminophen pain relievers was associated with lower rates of liver failure from these combination medications, although rates of liver failure from acetaminophen alone increased.[48] These results illustrate the complexities of balancing pain management and drug safety in real-world situations. In other research with therapeutic implications, scientists studying how liver cells chemically communicate with each other have uncovered a host of new targets for potential therapies against an advanced stage of nonalcoholic fatty liver disease currently lacking treatment options.[49] Also related to liver disease therapies, a clinical trial in adults showed that the addition of

Consortium for the Study of Chronic Pancreatitis, Diabetes, and Pancreatic Cancer

Pancreatitis is typically classified as acute (coming on suddenly and typically resolving over several days), or chronic (long-lasting), although there appears to be no clear boundary between these two types. Brief, acute episodes of pancreatitis can progress to the chronic form. There is no certain way to predict whether a person will progress from acute to chronic pancreatitis, which, if unchecked, can lead to serious life-threatening complications that can include diabetes and pancreatic cancer. Currently, there is no specific treatment for pancreatitis. The search for treatments has been hampered by the lack of large, long-term studies to understand the factors that influence how the disease develops and progresses. In addition, researchers have yet to identify early disease biomarkers. To address these needs, NIDDK, along with the National Cancer Institute, launched the Consortium for the Study of Chronic Pancreatitis, Diabetes, and Pancreatic Cancer in 2015.[1] The Consortium's goal is to design and conduct clinical studies to understand pancreatitis and its complications, including diabetes and pancreatic cancer. Since its inception, the Consortium has overseen several major clinical studies in both adults in children. Recent accomplishments include the discovery of molecular markers in the immune system that differ between people with acute and chronic pancreatitis, which could serve as indicators for different stages of the disease; and the identification of a possible biomarker that could detect a type of diabetes associated with pancreatitis.[2] Along with its large clinical studies, the Consortium conducts research on pancreatitis diagnosis and treatment, including new ways to treat pain. Because of the Consortium's significant accomplishments, NIDDK plans to support a new project period beginning in FY 2025. It is expected that this important effort will continue making great strides in understanding pancreatic disease, paving the way toward new treatments, and bringing hope to people with pancreatitis.

[1] www.dmscro.org/cpdpc
[2] Lee B, et al. Gastroenterology 165: 173-186, 2023; Hart PA, et al. J Clin Endocrinol Metab 108: e120-e128, 2023.

[45] Schneider KM, et al. Cell 186: 2823-2838.e20, 2023.
[46] Bernard-Raichon L, et al. Nat Commun 13: 5926, 2022.
[47] grants.nih.gov/grants/guide/rfa-files/RFA-DK-22-036.html; grants.nih.gov/grants/guide/rfa-files/RFA-DK-23-001.html
[48] Orandi BJ, et al. JAMA 329: 735-744, 2023.
[49] Wang S, et al. Sci Transl Med 15: eadd3949, 2023.

peginterferon to tenofovir therapy for chronic hepatitis B led to an increased rate of response, but only in people with a specific protein produced by the hepatitis B virus (called HBeAg) and/or a single type of hepatitis B virus called genotype A2.[50] In obesity-related research, a study in mice identified a substance produced by the gut that links surgical and dietary weight-loss therapies to improvements in metabolic and digestive health, suggesting that treatments targeting this pathway might have therapeutic value.[51] In nutrition-related research, a study showed that remodeling of the gut microbiome by providing adequate dietary fiber and minimally processed foods modulated human energy balance, findings that could inform future personalized nutrition approaches.[52] Advances such as these will pave the way for improving health and saving lives of people affected by digestive diseases, nutritional disorders, and obesity.

Budget Policy: The FY 2025 President's Budget request for this program is $692.8 million, a decrease of $32.0 million or 4.4 percent below the FY 2023 Final level. In FY 2025, NIDDK will continue major clinical research networks to help understand and treat liver diseases, including the Liver Cirrhosis Network that is conducting clinical and translational research toward expanding treatment options for this condition, and the Childhood Liver Disease Research Network that is facilitating discovery of new diagnostic, etiologic, and treatment options for children with liver disease.[53] NIDDK will also continue the Gastroparesis Clinical Research Consortium to accelerate research on the causes and progression of this disorder and to explore new approaches for treatment; the IBD Genetics Consortium to shed light on the underlying causes of IBD in diverse populations; and clinical trials testing new management approaches for celiac disease and ulcerative colitis.[54] Research on intestinal stem cells and the lymphatic system in digestive health and disease, which could inform understanding about many digestive diseases, will continue in FY 2025, along with other efforts, such as support for centers focused on digestive diseases research, as part of an overall balanced research program.

Kidney, Urologic, and Hematologic Diseases

The objectives of this program are to increase the understanding of diseases and disorders of the kidneys, urinary tract, and blood (hematologic), and to develop and test prevention and treatment strategies. Basic, clinical, and translational research, as well as research training, are supported in the areas of chronic kidney disease (CKD), diabetic kidney disease, end-stage kidney disease (ESKD or kidney failure), polycystic kidney disease (PKD), and many other kidney diseases; urinary incontinence, benign prostatic hyperplasia, interstitial cystitis/painful bladder syndrome, stones, impotence, congenital urologic disorders, and urinary tract infections; and disorders of the blood and blood-forming organs, including sickle cell disease, Cooley's anemia, hemochromatosis, and the anemia of inflammation and chronic disease.

In FY 2025, NIDDK will continue to support foundational research focused on kidney, urologic, and hematologic diseases. For example, scientists used cutting-edge methods to analyze the way

[50] Terrault NA, et al. Am J Gastroenterol 118: 1214-1225, 2023.
[51] Shin JH, et al. Cell Metab 34: 1765-1778.e6, 2022.
[52] Corbin KD, et al. Nat Commun 14: 3161, 2023.
[53] lcnstudy.org/; childrennetwork.org/
[54] jhuccs1.us/gpcrc; ibdgenetics.org/; reporter.nih.gov/project-details/10718458; reporter.nih.gov/project-details/10561414

different types of cells respond to kidney injuries that lead to fibrosis in mouse models.[55] The scientists assembled their data into an atlas of genetic activity profiles in various cell types that is broadly available as a useful resource for future research. In other research, a study in mice has identified a genetic factor that might help explain why some people with diabetes are more prone than others to kidney complications of the disease, providing a potential new therapeutic target.[56] Recent genetics research also holds promise to improve scientists' ability to predict who will develop PKD and who might benefit from treatments currently in development.[57] Relatedly, researchers used a combination of two ways to model PKD—organ-in-a-dish and organ-on-a-chip technologies—to identify a novel role for glucose uptake in PKD.[58] The innovative technologies could lead to better ways to test and develop PKD treatments in the future. Also related to kidney diseases, scientists used a type of machine learning to predict CKD progression in boys with posterior urethral valves, a congenital blockage of the urinary tract that can cause kidney failure and other serious complications.[59] This finding could help identify those at higher risk for CKD progression, for whom early intervention may be beneficial.

System Interventions to Achieve Early and Equitable Transplants Study

The optimal treatment for end-stage kidney disease (ESKD) is living donor kidney transplantation (LDKT). Despite their nearly four-fold greater incidence of ESKD compared to Whites, however, African Americans have lower rates of LDKT. At least four critical roadblocks hinder individuals' journey along the path to receiving LDKTs, particularly in African Americans. These include lack of awareness of the value of LDKT; insufficient knowledge of the procedure and difficulties discussing it with family and physicians; infrequent or sluggish referrals for early transplant evaluations; and hurdles in the multi-step evaluation process. Health systems have numerous capabilities that could potentially be leveraged to address these roadblocks and to reduce disparities. To test this possibility, NIDDK funded the System Interventions to Achieve Early and Equitable Transplants Study (STEPS). STEPS is a comparative effectiveness trial to assess the benefits of a 'health system surveillance and outreach' approach compared to usual care to mitigate race disparities in LDKT. The study is being conducted in two large health systems in the U.S. South, where disparities in kidney disease are extremely prevalent, and where LDKT is most desperately needed. STEPS integrates a registry of electronic health information to identify all potential candidates for pre-emptive or early LDKT referral by using patients' laboratory data and a validated computer-generated kidney disease progression risk prediction algorithm. Transplant social workers and coordinators working with the study contact potential LDKT candidates to help them address contextual factors (including educational, social, logistical, and navigation needs) that pose roadblocks to the procedure. STEPS scientists are measuring patients' initiation and completion of kidney transplant evaluations using health system records and the effectiveness of the study's navigation support on the kidney transplant evaluation process. STEPS is expected to provide evidence needed to help reduce LDKT disparities in the South and across the Nation.

In other research with clinical implications, a study suggests that two manifestations of overactive bladder may reflect a spectrum of symptom severity rather than two distinct subtypes of urinary urgency with or without incontinence.[60] Increased knowledge about these conditions could help determine if some people respond better to certain treatments, enabling a more personalized and targeted approach to treatment. In hematology-related research, the discovery of a protein involved in post-birth production of fetal hemoglobin provides a new potential therapeutic approach to treat some

[55] Li H, et al. Cell Metab 34: 1977-1998.e9, 2022.
[56] Wang Q, et al. Nat Metab 5: 607-625, 2023.
[57] Chang AR, et al. JAMA 328: 2412-2421, 2022.
[58] Li SR, et al. Nat Commun 13: 7918, 2022.
[59] Weaver JK, et al. Pediatr Nephrol 38: 839-846, 2023.
[60] Lai HH, et al. J Urol 209: 233-242, 2023.

blood disorders.[61] To encourage future innovations, NIDDK supports the Stimulating Urology Interdisciplinary Team Opportunity Research (SUITOR) and Stimulating Hematology Investigation: New Endeavors (SHINE) programs.[62]

Budget Policy: The FY 2025 President's Budget request for this program is $554.5 million, a decrease of $1.2 million or 0.2 percent below the FY 2023 Final level. In FY 2025, NIDDK plans to continue supporting research related to kidney diseases to improve health and save lives, such as the Chronic Kidney Diseases of UnceRtain Etiology in Agricultural Communities (CURE) Research Consortium; research addressing structural racism to reduce kidney health disparities; Kidney Precision Medicine Project (KPMP) research toward developing more personalized care for people with kidney diseases; and the Caring for OutPatiEnts after Acute Kidney Injury (COPE-AKI) program (described in the Director's Overview above).[63] NIDDK also plans to continue its support of research networks focused on enhancing understanding of glomerular diseases, urologic chronic pelvic pain syndrome, and lower urinary tract symptoms. Centers focused on kidney, urologic, and hematologic research—including a new O'Brien Kidney Consortium[64]—will receive continued funding in FY 2025, along with other efforts as part of an overall balanced research program.

Special Statutory Funding Program for Type 1 Diabetes Research

Complementing efforts of the Diabetes, Endocrinology, and Metabolic Diseases program, the overarching goal of the Special Diabetes Program (SDP) is to foster a deeper understanding of type 1 diabetes toward improved treatment, prevention, and cure of the disease and its complications through basic, clinical, and translational research. Research supported by the SDP is leading to landmark new prevention and treatment approaches for type 1 diabetes. For example, decades of SDP-supported foundational research and clinical trials culminated in recent FDA approvals of the first drug (teplizumab) that can delay onset of type 1 diabetes diagnosis in people at high risk for developing the disease; the first cellular therapy to treat adults with type 1 diabetes who have recurrent episodes of hypoglycemia (dangerously low blood glucose levels); and a new bionic pancreas system that eases the burden of type 1 diabetes management by handing dosing decisions autonomously and eliminating the need for carbohydrate counting.[65]

SDP-supported research is yielding other important advances that are improving the health of people with type 1 diabetes. A recent clinical trial showed that the Control-IQ artificial pancreas device performed better than standard of care in very young children with type 1 diabetes.[66] Telemedicine was successfully used to teach families how to use the device, suggesting that this technology could be made available to people in areas without nearby specialty care. In another trial, Type 1 Diabetes TrialNet reported that although the drug abatacept did not delay type 1 diabetes diagnosis, it impacted immune cell subsets and preserved insulin secretion. These

[61] Feng R, et al. Nature 610: 783–790, 2022.
[62] grants.nih.gov/grants/guide/pa-files/PAS-22-074.html; grants.nih.gov/grants/guide/pa-files/PAS-22-096.html
[63] ckducureconsortium.org/; grants.nih.gov/grants/guide/rfa-files/RFA-DK-22-014.html; www.kpmp.org/; classic.clinicaltrials.gov/ct2/show/NCT05805709
[64] grants.nih.gov/grants/guide/rfa-files/rfa-dk-22-007.html; grants.nih.gov/grants/guide/rfa-files/RFA-DK-22-008.html
[65] See Director's Overview for links to FDA press releases.
[66] Wadwa RP, et al. N Engl J Med 388: 991-1001, 2023.

results informed a new TrialNet trial testing abatacept in combination with another agent in people with new-onset type 1 diabetes.[67] To advance health equity, the SDP supports research to improve technology adoption in individuals from underrepresented backgrounds with type 1 diabetes, and to investigate the use of social and medical care interventions to improve diabetes outcomes.[68] Future plans include supporting new research to study the neurocognitive impact of type 1 diabetes in children and adults; continuing a research consortium studying people with type 1 diabetes and impaired awareness of hypoglycemia; and continuing research studying heart disease in type 1 diabetes.[69] NIDDK also plans to continue a national career development program to increase the diversity of physician scientists studying type 1 diabetes.[70]

Budget Policy: The FY 2025 President's Budget request for the Special Statutory Funding Program for Type 1 Diabetes Research proposes an extension of the program providing $250.0 million in FY 2024, $260.0 million in FY 2025, and $270.0 million in FY 2026.

Intramural Research

The objective of the Institute's Intramural Research Program (IRP) is to conduct basic, translational, and clinical biomedical research related to diabetes and other endocrine and metabolic diseases; digestive diseases, including liver diseases and nutritional disorders; obesity; kidney diseases; and hematologic diseases. Intramural research is conducted in the Institute's laboratories and clinical facilities in Bethesda, Maryland, as well as in Phoenix, Arizona, where a long-standing research relationship with American Indian communities in the region has led to important scientific advances in diagnosing and treating type 2 diabetes and obesity. Recently, IRP researchers revealed the structure and function of proteins that help to repair damaged DNA in human cells, providing clues to treating disorders resulting from DNA damage.[71] They also demonstrated that a complex interplay among gut, liver, and microbes underlies metabolic changes in chronic hepatitis C, and showed that people with pre-existing autoimmunity were more likely to have severe COVID-19 outcomes.[72] In FY 2025, the Intramural Research Program will continue to advance research in these and other areas.

Budget Policy: The FY 2025 President's Budget request for this program is $248.8 million, an increase of $8.1 million or 3.4 percent compared with the FY 2023 Final level.

Research Management and Support

Research Management and Support (RMS) activities provide administrative, budgetary, logistical, and scientific support in the review, award, and monitoring of research grants, research training awards, and research and development contracts. RMS functions also encompass strategic planning, coordination, and evaluation of the Institute's programs;

[67] Russell WE, et al. Diabetes Care 46: 1005-1013, 2023; trialnet.org/our-research/newly-diagnosed-t1d/t1d-relay
[68] grants.nih.gov/grants/guide/rfa-files/rfa-dk-21-018.html; grants.nih.gov/grants/guide/rfa-files/RFA-DK-22-028.html
[69] grants.nih.gov/grants/guide/rfa-files/RFA-DK-23-010.html; grants.nih.gov/grants/guide/rfa-files/RFA-DK-21-020.html; https://care-t1d.org/
[70] grants.nih.gov/grants/guide/rfa-files/rfa-dk-21-019.html
[71] Kim J, et al. Nature 617: 170-175, 2023.
[72] Ali RO, et al. Nat Microbiol 8: 12-27, 2023; Yadaw AS, et al. Clin Infect Dis 77: 816-826, 2023.

regulatory compliance; international coordination; and liaison with other Federal agencies, Congress, and the public. Through RMS activities, NIDDK continues its administrative support of meritorious basic, clinical, and translational research and research training efforts, and continues its communication of research-based health information to patients, health professionals, and the public.[73]

Budget Policy: The FY 2025 President's Budget request for this program is $90.9 million, an increase of $3.3 million or 3.7 percent compared with the FY 2023 Final level.

[73] niddk.nih.gov/health-information

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National Institute of Diabetes and Digestive and Kidney Diseases

Appropriations History

Fiscal Year	Budget Estimate to Congress [1]	House Allowance	Senate Allowance	Appropriation
2016	$1,938,133,000	$1,921,388,000	$1,975,162,000	$1,968,357,000
2017	$1,966,310,000	$1,862,093,000	$1,891,652,000	$2,020,595,000
Sequestration				($10,350,000)
2018	$1,599,534,000	$1,899,733,000	$1,935,597,000	$2,120,797,000
2019	$1,965,434,000	$2,144,333,000	$2,180,892,000	$2,179,823,000
2020	$1,896,493,000	$2,129,027,000	$2,155,327,000	$2,264,314,000
2021	$2,074,211,000	$2,282,498,000	$2,319,021,000	$2,281,975,000
2022	$2,360,748,000	$2,380,075,000	$2,358,586,000	$2,353,926,000
Sequestration				($8,550,000)
2023	$2,347,530,000	$2,424,939,000	$2,432,248,000	$2,450,721,000
Sequestration				($8,550,000)
2024	$2,553,098,000	$2,300,721,000	$2,310,721,000	$2,550,721,000
2025	$2,569,991,000			

[1] Includes mandatory funding for Type 1 Diabetes.

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Authorizing Legislation

	PHS Act/ Other Citation	U.S. Code Citation	2024 Amount Authorized	FY 2024 CR	2025 Amount Authorized	FY 2025 President's Budget
Research and Investigation	Section 301	42§241	Indefinite	$2,300,721,000	Indefinite	$2,309,991,000
National Institute of Diabetes and Digestive and Kidney Diseases	Section 401(a)	42§281	Indefinite		Indefinite	
Total, Budget Authority				$2,300,721,000		$2,309,991,000

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Amounts Available for Obligation [1]

(Dollars in Thousands)

Source of Funding	FY 2023 Final	FY 2024 CR	FY 2025 President's Budget
Appropriation	$2,300,721	$2,300,721	$2,309,991
Mandatory Appropriation: (non-add)			
Type 1 Diabetes	*($150,000)*	*($250,000)*	*($260,000)*
Type 1 Diabetes Sequestration	*-($8,550)*	*($0)*	*($0)*
Subtotal, adjusted appropriation	$2,300,721	$2,300,721	$2,309,991
OAR HIV/AIDS Transfers	$2,377	$0	$0
Subtotal, adjusted budget authority	**$2,303,098**	**$2,300,721**	**$2,309,991**
Unobligated balance lapsing	-$141	$0	$0
Total obligations	$2,302,957	$2,300,721	$2,309,991

[1] Excludes the following amounts (in thousands) for reimbursable activities carried out by this account:
FY 2023 - $6,757 FY 2024 - $8,000 FY 2025 - $8,000

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

		FY 2024 CR	FY 2025 President's Budget
Total compensable workyears:			
	Full-time equivalent	756	756
	Full-time equivalent of overtime and holiday hours	1	1
	Average ES salary	$224	$230
	Average GM/GS grade	12.5	12.5
	Average GM/GS salary	$134	$138
	Average salary, Commissioned Corps (42 U.S.C. 207)	$130	$136
	Average salary of ungraded positions	$134	$138
OBJECT CLASSES		**FY 2024 CR**	**FY 2025 President's Budget**
	Personnel Compensation		
11.1	Full-Time Permanent	$57,818	$59,437
11.3	Other Than Full-Time Permanent	$52,915	$54,397
11.5	Other Personnel Compensation	$5,428	$5,580
11.7	Military Personnel	$1,211	$1,268
11.8	Special Personnel Services Payments	$14,706	$15,118
11.9	**Subtotal Personnel Compensation**	**$132,078**	**$135,800**
12.1	Civilian Personnel Benefits	$46,022	$47,570
12.2	Military Personnel Benefits	$217	$237
13.0	Benefits to Former Personnel	$0	$0
	Subtotal Pay Costs	**$178,317**	**$183,607**
21.0	Travel & Transportation of Persons	$1,750	$1,750
22.0	Transportation of Things	$250	$250
23.1	Rental Payments to GSA	$200	$200
23.2	Rental Payments to Others	$10	$10
23.3	Communications, Utilities & Misc. Charges	$203	$203
24.0	Printing & Reproduction	$8	$8
25.1	Consulting Services	$54,988	$56,534
25.2	Other Services	$25,691	$24,342
25.3	Purchase of Goods and Services from Government Accounts	$153,762	$156,135
25.4	Operation & Maintenance of Facilities	$504	$504
25.5	R&D Contracts	$22,084	$20,484
25.6	Medical Care	$1,000	$1,000
25.7	Operation & Maintenance of Equipment	$5,218	$5,218
25.8	Subsistence & Support of Persons	$0	$0
25.0	**Subtotal Other Contractual Services**	**$263,247**	**$264,217**
26.0	Supplies & Materials	$11,041	$11,041
31.0	Equipment	$3,020	$3,020
32.0	Land and Structures	$1,795	$1,795
33.0	Investments & Loans	$0	$0
41.0	Grants, Subsidies & Contributions	$1,840,874	$1,843,884
42.0	Insurance Claims & Indemnities	$0	$0
43.0	Interest & Dividends	$6	$6
44.0	Refunds	$0	$0
	Subtotal Non-Pay Costs	**$2,122,404**	**$2,126,384**
	Total Budget Authority by Object Class	**$2,300,721**	**$2,309,991**

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

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Salaries and Expenses

(Dollars in Thousands)

Object Classes	FY 2024 CR	FY 2025 President's Budget
Personnel Compensation		
Full-Time Permanent (11.1)	$57,818	$59,437
Other Than Full-Time Permanent (11.3)	$52,915	$54,397
Other Personnel Compensation (11.5)	$5,428	$5,580
Military Personnel (11.7)	$1,211	$1,268
Special Personnel Services Payments (11.8)	$14,706	$15,118
Subtotal, Personnel Compensation (11.9)	**$132,078**	**$135,800**
Civilian Personnel Benefits (12.1)	$46,022	$47,570
Military Personnel Benefits (12.2)	$217	$237
Benefits to Former Personnel (13.0)	$0	$0
Subtotal Pay Costs	**$178,317**	**$183,607**
Travel & Transportation of Persons (21.0)	$1,750	$1,750
Transportation of Things (22.0)	$250	$250
Rental Payments to Others (23.2)	$10	$10
Communications, Utilities & Misc. Charges (23.3)	$203	$203
Printing & Reproduction (24.0)	$8	$8
Other Contractual Services		
Consultant Services (25.1)	$54,881	$56,427
Other Services (25.2)	$25,691	$24,342
Purchase of Goods and Services from Government Accounts (25.3)	$91,744	$93,885
Operation & Maintenance of Facilities (25.4)	$504	$504
Operation & Maintenance of Equipment (25.7)	$5,218	$5,218
Subsistence & Support of Persons (25.8)	$0	$0
Subtotal Other Contractual Services	**$178,038**	**$180,376**
Supplies & Materials (26.0)	$11,041	$11,041
Subtotal Non-Pay Costs	**$191,300**	**$193,638**
Total Administrative Costs	**$369,617**	**$377,245**

NATIONAL INSTITUTES OF HEALTH
National Institute of Diabetes and Digestive and Kidney Diseases

Detail of Full-Time Equivalent Employment (FTE)

Office	FY 2023 Final			FY 2024 CR			FY 2025 President's Budget		
	Civilian	Military	Total	Civilian	Military	Total	Civilian	Military	Total
Division of Extramural Activities									
Direct:	67	-	67	70	-	70	70	-	70
Total:	67	-	67	70	-	70	70	-	70
Office of the Director									
Direct:	146	-	146	149	-	149	149	-	149
Total:	146	-	146	149	-	149	149	-	149
Division of Diabetes, Endocrinology, and Metabolic Diseases									
Direct:	32	-	32	32	-	32	32	-	32
Reimbursable:	3	-	3	3	-	3	3	-	3
Total:	35	-	35	35	-	35	35	-	35
Division of Digestive Diseases and Nutrition									
Direct:	33	1	34	33	1	34	33	1	34
Total:	33	1	34	33	1	34	33	1	34
Division of Kidney, Urologic, and Hematologic Diseases									
Direct:	28	-	28	30	-	30	30	-	30
Total:	28	-	28	30	-	30	30	-	30
Division of Intramural Research Programs									
Direct:	382	6	388	432	6	438	432	6	438
Total:	382	6	388	432	6	438	432	6	438
Total	691	7	698	749	7	756	749	7	756

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

FISCAL YEAR	Average GS Grade
2021	12.0
2022	12.5
2023	12.4
2024	12.5
2025	12.5

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Detail of Positions [1]

GRADE	FY 2023 Final	FY 2024 CR	FY 2025 President's
Total, ES Positions	1	1	1
Total, ES Salary	$212,100	$223,627	$229,888
General Schedule			
GM/GS-15	72	74	75
GM/GS-14	84	88	86
GM/GS-13	119	124	126
GS-12	76	83	82
GS-11	35	40	42
GS-10	7	10	10
GS-9	19	24	25
GS-8	6	8	5
GS-7	17	20	21
GS-6	2	2	4
GS-5	9	10	8
GS-4	0	0	0
GS-3	1	1	0
GS-2	1	1	1
GS-1	0	0	0
Subtotal	448	485	485
Commissioned Corps (42 U.S.C. 207)			
Assistant Surgeon General	0	0	0
Director Grade	3	3	3
Senior Grade	3	3	3
Full Grade	1	1	1
Senior Assistant Grade	0	0	0
Assistant Grade	0	0	0
Junior Assistant	0	0	0
Subtotal	7	7	7
Ungraded	273	297	297
Total permanent positions	453	491	491
Total positions, end of year	729	790	790
Total full-time equivalent (FTE) employment, end of year	698	756	756
Average ES salary	$212,100	$223,627	$229,888
Average GM/GS grade	12.4	12.5	12.5
Average GM/GS salary	$127,297	$134,215	$137,973

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