DEPARTMENT OF HEALTH AND HUMAN SERVICES

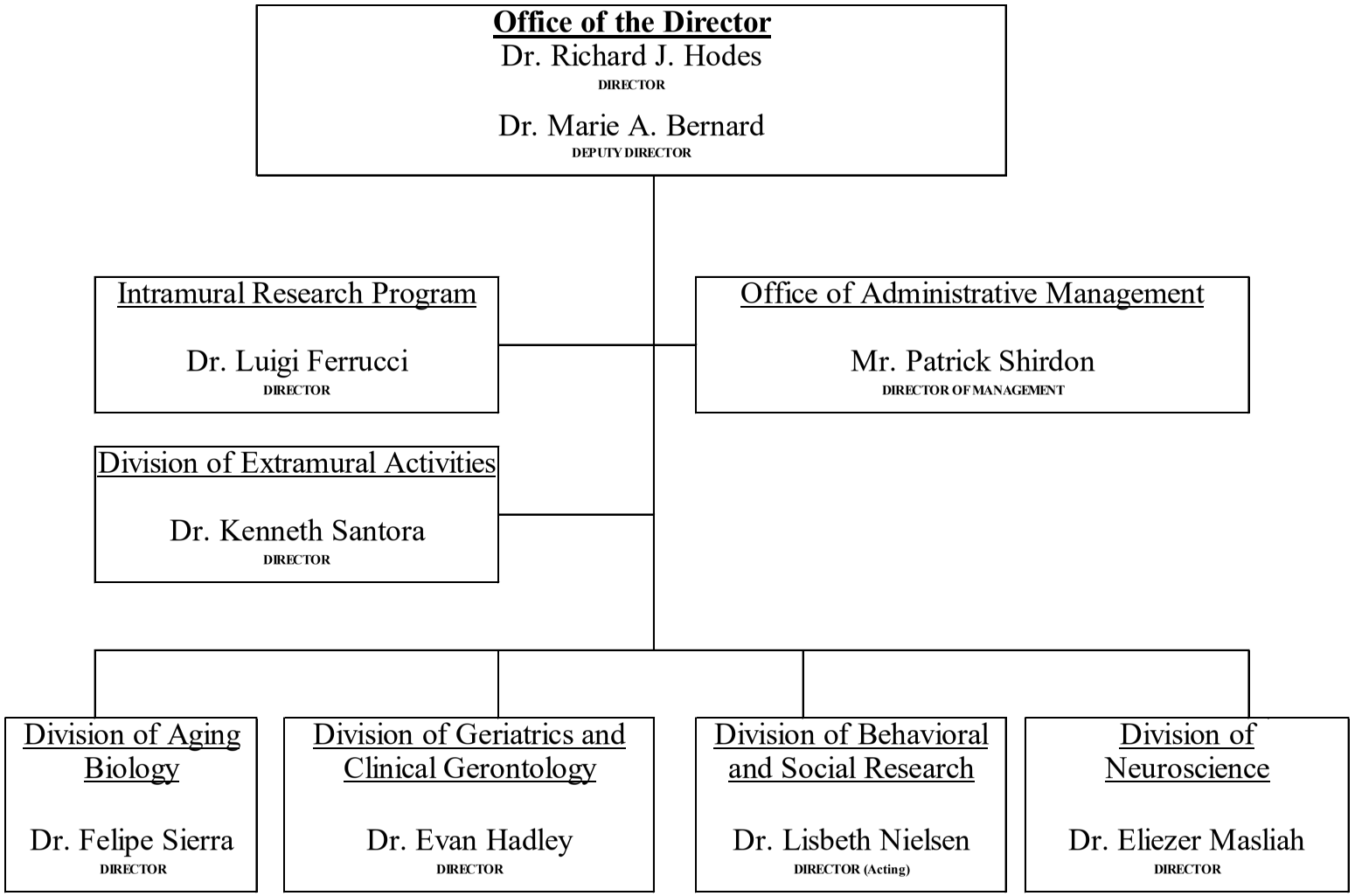
NATIONAL INSTITUTES OF HEALTH

National Institute on Aging (NIA)

FY 2021 Budget — Page No.

NATIONAL INSTITUTES OF HEALTH
National Institute on Aging

Organizational Structure



NATIONAL INSTITUTES OF HEALTH

National Institute on Aging

For carrying out section 301 and title IV of the PHS Act with respect to aging,

[$3,543,673,000]*$3,225,782,000*.

NATIONAL INSTITUTES OF HEALTH
National Institute on Aging

Amounts Available for Obligation[1]

(Dollars in Thousands)

Source of Funding	FY 2019 Final	FY 2020 Enacted	FY 2021 President's Budget
Appropriation	$3,083,410	$3,543,673	$3,225,782
Mandatory Appropriation: (non-add)			
Type 1 Diabetes	*(0)*	*(0)*	*(0)*
Other Mandatory financing	*(0)*	*(0)*	*(0)*
Rescission	0	0	0
Sequestration	0	0	0
Secretary's Transfer	-10,591	0	0
Subtotal, adjusted appropriation	$3,072,819	$3,543,673	$3,225,782
OAR HIV/AIDS Transfers	7,258	2,196	0
HEAL Transfer from NINDS	0	0	0
Subtotal, adjusted budget authority	$3,080,077	$3,545,869	$3,225,782
Unobligated balance, start of year	0	0	0
Unobligated balance, end of year	0	0	0
Subtotal, adjusted budget authority	$3,080,077	$3,545,869	$3,225,782
Unobligated balance lapsing	-34	0	0
Total obligations	$3,080,043	$3,545,869	$3,225,782

[1] Excludes the following amounts (in thousands) for reimbursable activities carried out by this account:
FY 2019 - $8,481 FY 2020 - $9,293 FY 2021 - $9,293

NATIONAL INSTITUTES OF HEALTH
National Institute on Aging

Budget Mechanism - Total[1]

(Dollars in Thousands)

MECHANISM	FY 2019 Final		FY 2020 Enacted		FY 2021 President's Budget		FY 2021 +/- FY 2020 Enacted	
	No.	Amount	No.	Amount	No.	Amount	No.	Amount
Research Projects:								
Noncompeting	1,572	$1,063,756	1,892	$1,495,223	2,126	$1,702,801	234	$207,578
Administrative Supplements	*(506)*	172,109	*(564)*	189,910	*(206)*	70,000	*(-358)*	-119,910
Competing:								
Renewal	72	138,058	62	119,426	57	110,000	-5	-9,426
New	970	900,269	844	783,350	574	473,362	-270	-309,988
Supplements	9	12,621	8	11,191	9	12,000	1	809
Subtotal, Competing	1,051	$1,050,947	914	$913,967	640	$595,362	-274	-$318,605
Subtotal, RPGs	2,623	$2,286,812	2,806	$2,599,100	2,766	$2,368,163	-40	-$230,937
SBIR/STTR	151	103,273	170	116,091	154	105,515	-16	-10,576
Research Project Grants	2,774	$2,390,085	2,976	$2,715,191	2,920	$2,473,678	-56	-$241,513
Research Centers:								
Specialized/Comprehensive	107	$186,733	120	$212,140	108	$190,926	-12	-$21,214
Clinical Research	0	0	0	0	0	0	0	0
Biotechnology	0	1,029	0	0	0	0	0	0
Comparative Medicine	0	4,365	0	1,117	0	1,005	0	-112
Research Centers in Minority Institutions	0	0	0	0	0	0	0	0
Research Centers	107	$192,127	120	$213,257	108	$191,931	-12	-$21,326
Other Research:								
Research Careers	320	$49,976	364	$56,811	327	$51,130	-37	-$5,681
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	0	0	0	0	0	0	0
Other	94	76,825	105	84,063	94	75,656	-11	-8,407
Other Research	414	$126,801	469	$140,874	421	$126,786	-48	-$14,088
Total Research Grants	3,295	$2,709,014	3,565	$3,069,322	3,449	$2,792,395	-116	-$276,927
Ruth L Kirchstein Training Awards:	FTTPs		FTTPs		FTTPs		FTTPs	
Individual Awards	175	$8,285	182	$8,605	164	$7,745	-18	-$860
Institutional Awards	482	25,685	536	28,634	482	25,771	-54	-2,863
Total Research Training	657	$33,970	718	$37,239	646	$33,516	-72	-$3,723
Research & Develop. Contracts	57	$91,614	55	$103,302	50	$92,972	-5	-$10,330
(SBIR/STTR) (non-add)	*(0)*	*(925)*	*(0)*	*(1,047)*	*(0)*	*(942)*	*(0)*	*(-105)*
Intramural Research	228	170,959	235	246,122	235	221,510	0	-24,612
Res. Management & Support	189	74,520	200	89,884	200	85,389	0	-4,495
Res. Management & Support (SBIR Admin) (non-add)	*(0)*	*(1,464)*	*(0)*	*(1,836)*	*(0)*	*(1,744)*	*(0)*	*(-92)*
Construction		0		0		0		0
Buildings and Facilities		0		0		0		0
Total, NIA	417	$3,080,077	435	$3,545,869	435	$3,225,782	0	-$320,087

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

Major Changes in the Fiscal Year 2021 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 2021 President's Budget request for NIA, which is $3,225.8 million, a decrease of $320.1 million from the FY 2020 Enacted level. The FY 2021 President's Budget reflects the Administration's fiscal policy goals for the Federal Government. Within that framework, NIA will pursue its highest research priorities through strategic investments and careful stewardship of appropriated funds.

Non-Competing Research Project Grants (+$207.6 million; total $1,702.8 million):
NIA will continue to support its established non-competing Research Project Grants (RPGs) awarding a total of 2,126 RPGs, an increase of 234 from FY 2020. This increase is the result of the increased number of competing RPGs that NIA awarded during previous fiscal years. Funding of non-competing RPGs in FY 2021 includes a reduction of 7.0 percent from the full commitment level in order to free up funds for competing RPG awards.

Competing Research Project Grants (-$318.6 million; total $595.4 million):
NIA will award a total of 640 competing RPGs, a decrease of 274 from FY 2020. The decrease in competing RPGs is based on the transition of previously awarded RPGs into non-competing status.

Research Centers (-$21.3 million; total $191.9 million):
NIA will award a total of 108 Research Centers, a decrease of 12 from FY 2020. NIA will identify savings and reductions in Research Centers in order to award more RPGs.

Intramural Research (-$24.6 million; total $221.5 million):
The FY 2021 funding level will allow NIA will continue to conduct priority research in its intramural program, with a funding reduction of 10.0 percent from the FY 2020 Enacted level.

NATIONAL INSTITUTES OF HEALTH
National Institute on Aging

Summary of Changes

(Dollars in Thousands)

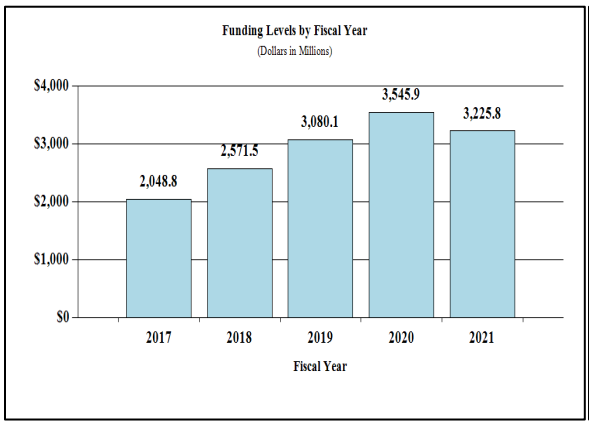
FY 2020 Enacted	$3,545,869
FY 2021 President's Budget	$3,225,782
Net change	-$320,087

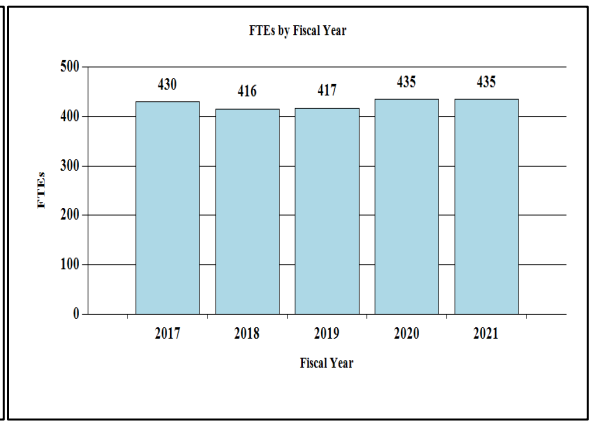
CHANGES	FY 2021 President's Budget FTEs	FY 2021 President's Budget Budget Authority	Change from FY 2020 Enacted FTEs	Change from FY 2020 Enacted Budget Authority
A. Built-in:				
1. Intramural Research:				
a. Annualization of January 2020 pay increase & benefits		$50,764		$330
b. January FY 2021 pay increase & benefits		50,764		753
c. Paid days adjustment		50,764		-190
d. Differences attributable to change in FTE		50,764		0
e. Payment for centrally furnished services		16,053		-845
f. Cost of laboratory supplies, materials, other expenses, and non-recurring costs		154,693		1,185
Subtotal				$1,233
2. Research Management and Support:				
a. Annualization of January 2020 pay increase & benefits		$36,685		$234
b. January FY 2021 pay increase & benefits		36,685		562
c. Paid days adjustment		36,685		-137
d. Differences attributable to change in FTE		36,685		0
e. Payment for centrally furnished services		8,268		-435
f. Cost of laboratory supplies, materials, other expenses, and non-recurring costs		40,436		-317
Subtotal				-$93
Subtotal, Built-in				$1,140

CHANGES	FY 2021 President's Budget No.	FY 2021 President's Budget Amount	Change from FY 2020 Enacted No.	Change from FY 2020 Enacted Amount
B. Program:				
1. Research Project Grants:				
a. Noncompeting	2,126	$1,772,801	234	$87,668
b. Competing	640	595,362	-274	-318,605
c. SBIR/STTR	154	105,515	-16	-10,576
Subtotal, RPGs	2,920	$2,473,678	-56	-$241,513
2. Research Centers	108	$191,931	-12	-$21,326
3. Other Research	421	126,786	-48	-14,088
4. Research Training	646	33,516	-72	-3,723
5. Research and development contracts	50	92,972	-5	-10,330
Subtotal, Extramural		$2,918,883		-$290,980
	FTEs		FTEs	
6. Intramural Research	235	$221,510	0	-$25,845
7. Research Management and Support	200	85,389	0	-4,402
8. Construction		0		0
9. Buildings and Facilities		0		0
Subtotal, Program	435	$3,225,782	0	-$321,227
Total changes				-$320,087

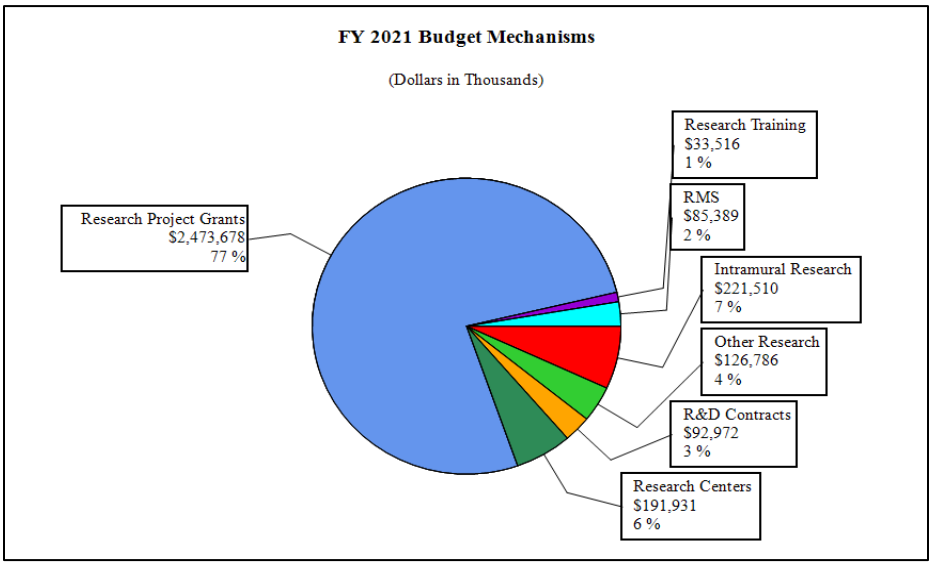
Fiscal Year 2021 Budget Graphs

History of Budget Authority and FTEs:

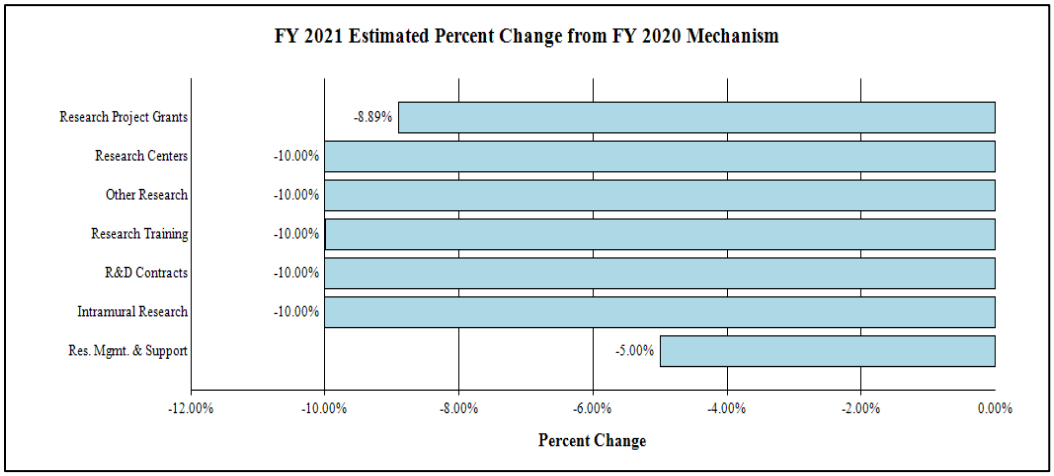




Distribution by Mechanism:



Change by Selected Mechanism:



NATIONAL INSTITUTES OF HEALTH
National Institute on Aging

Budget Authority by Activity[1]

(Dollars in Thousands)

	FY 2019 Final		FY 2020 Enacted		FY 2021 President's Budget		FY 2021 +/- FY2020	
Extramural Research	**FTE**	**Amount**	**FTE**	**Amount**	**FTE**	**Amount**	**FTE**	**Amount**
Detail								
Aging Biology		$313,286		$354,761		$322,601		-$32,160
Behavioral & Social Research		436,577		494,375		449,559		-44,816
Geriatrics & Clinical Gerontology		290,599		329,070		299,240		-29,830
Neuroscience		1,794,136		2,031,657		1,847,483		-184,174
Subtotal, Extramural		**$2,834,598**		**$3,209,863**		**$2,918,883**		**-$290,980**
Intramural Research	**228**	**$170,959**	**235**	**$246,122**	**235**	**$221,510**	**0**	**-$24,612**
Research Management & Support	**189**	**$74,520**	**200**	**$89,884**	**200**	**$85,389**	**0**	**-$4,495**
TOTAL	**417**	**$3,080,077**	**435**	**$3,545,869**	**435**	**$3,225,782**	**0**	**-$320,087**

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

NATIONAL INSTITUTES OF HEALTH
National Institute on Aging

Authorizing Legislation

	PHS Act/ Other Citation	U.S. Code Citation	2020 Amount Authorized	FY 2020 Enacted	2021 Amount Authorized	FY 2021 President's Budget
Research and Investigation	Section 301	42§241	Indefinite	$3,545,869,000	Indefinite	$3,225,782,000
National Institute on Aging	Section 401(a)	42§281	Indefinite		Indefinite	
Total, Budget Authority				$3,545,869,000		$3,225,782,000

NATIONAL INSTITUTES OF HEALTH
National Institute on Aging

Appropriations History

Fiscal Year	Budget Estimate to Congress	House Allowance	Senate Allowance	Appropriation
2012	$1,129,987,000	$1,129,987,000	$1,088,091,000	$1,105,530,000
Rescission				$2,089,452
2013	$1,102,650,000		$1,124,265,000	$1,103,440,548
Rescission				$2,206,881
Sequestration				($55,385,128)
2014	$1,193,370,000		$1,185,439,000	$1,171,038,000
Rescission				$0
2015	$1,170,880,000			$1,199,468,000
Rescission				$0
2016	$1,267,078,000	$1,518,421,000	$1,548,494,000	$1,600,191,000
Rescission				$0
2017[1]	$1,598,246,000	$1,982,102,000	$2,067,138,000	$2,048,610,000
Rescission				$0
2018	$1,303,541,000	$2,458,733,000	$2,535,539,000	$2,574,091,000
Rescission				$0
2019	$1,988,200,000	$3,005,831,000	$3,084,809,000	$3,083,410,000
Rescission				$0
2020	$2,654,144,000	$3,356,107,000	$3,606,040,000	$3,543,673,000
Rescission				$0
2021	$3,225,782,000			

[1] Budget Estimate to Congress includes mandatory financing.

Justification of Budget Request

National Institute on Aging

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

Budget Authority (BA):

	FY 2019 Final	FY 2020 Enacted	FY 2021 President's Budget	FY 2021 +/- FY 2020
BA	$3,080,077,000	$3,545,869,000	$3,225,782,000	-$320,087,000
FTE	417	435	435	0

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

Director's Overview

In 2000, approximately 35 million Americans were aged 65 and older. With the aging of the Baby Boomers, this number has grown to approximately 56.4 million in 2020 and may rise above 82 million in 2040 – more than doubling in 40 years. This remarkable demographic shift is having and will continue to have profound social and economic impacts on our nation. Now more than ever, it is critical to support research that will enable Americans ages 65 and older to maintain healthy, independent, and productive lives.

Aging itself remains the most important risk factor for many devastating diseases and conditions, including Alzheimer's disease and related forms of dementia (AD/ADRD); most types of cancer; many types of heart disease; osteoporosis and hip fracture; kidney failure; and diabetes. The National Institute on Aging (NIA) is meeting the challenges presented by this demographic shift through its ongoing mission to:

- Support and conduct genetic, biological, clinical, behavioral, social, and economic research on aging.
- Foster the development of research and clinician scientists in aging.
- Provide research resources.
- Disseminate information about aging and advances in research to the public, health care professionals, and the scientific community, among a variety of audiences.

Since 1974, NIA has pursued this mission by funding extramural research at universities and medical centers across the United States and around the world; maintaining an active communications and outreach program; and conducting a vibrant intramural research program at NIA laboratories in Baltimore and Bethesda, Maryland. As the lead federal agency for research on AD/ADRD, NIA has worked toward understanding and addressing these conditions over the

past seven years, and the Institute's plans and priorities reflect this extraordinary opportunity for discovery.

Alzheimer's Disease Research: Looking Back, Moving Forward

In 2019, the NIA observed its 45th anniversary, and in many respects, the history of the NIA is closely entwined with the history of research on AD/ADRD. In the mid-1970s, Alzheimer's disease was poorly understood, and many people outside the medical and scientific communities considered it to be an inevitable consequence of growing old. Today, we no longer accept that as a truism. In fact, the Congress, through the National Alzheimer's Project Act (NAPA), has established the ambitious goal of identifying an effective treatment or validated preventive intervention by 2025. Even before NAPA was signed into law in 2011, however, NIA-supported researchers had laid a foundation for progress in a number of areas. For example:

1979: 40 years ago, tacrine, which would become the first FDA-approved drug for AD, had just entered clinical trials with NIA support. Today, the National Institutes of Health (NIH), led by NIA, supports over 200 clinical trials, including both pilot and large-scale trials, of a wide range of interventions to prevent/slow/treat AD and/or cognitive decline, address neuropsychiatric symptoms of dementia, and support dementia caregivers. Approximately 90 of these studies are testing cost-effective non-pharmacological interventions, including diet, exercise, and cognitive training.

Program Portrait: SPRINT MIND

High blood pressure, or hypertension, is very common in people over the age of 50. A growing body of research suggests that hypertension, in addition to being a leading risk factor for heart disease, stroke, and kidney failure, may increase risk for dementia later in life. But does controlling hypertension reduce risk of dementia? NIA-supported investigators with the Systolic Blood Pressure Intervention Trial Memory and Cognition in Decreased Hypertension (SPRINT MIND) compared the effects of intensive blood pressure control—i.e., targeting a systolic blood pressure of less than 120 mmHg—with standard treatment toward a target of less than 140 mmHg on cognition and new cases of dementia among 9,300 adults ages 50 and older at high risk of cardiovascular disease. The investigators found that intensive lowering of blood pressure did not significantly reduce dementia risk, but it did significantly reduce mild cognitive impairment (MCI), a well-established risk factor and often a precursor to dementia. This is the first randomized clinical trial demonstrating that an intervention significantly reduces the occurrence of MCI. These results also provide reassuring evidence that intensive blood pressure control is safe for the brain, and further underscore the important connection between vascular and brain health.

SPRINT MIND is one of a number of NIA-supported studies exploring potential links between cardiovascular conditions and MCI and dementia. For example, NIA is funding the addition of cognitive assessments and testing for plasma biomarkers of Alzheimer's disease to the National Heart, Lung, and Blood Institute (NHLBI)-supported Jackson Heart Study, a long-running, community-based cohort study of the etiology of heart, lung, and kidney disease among African Americans. This study will quantify the prevalence of MCI and dementia, examine the associations of long-term exposure to high blood pressure with established and novel measures of brain health, and determine the role of biologic factors and social determinants of health in modifying the risk of MCI and dementia among African Americans, a population with a high burden of hypertension. NIA also supports the addition of cognitive testing to

NHLBI's Coronary Artery Risk Development in Young Adults (CARDIA) study, which has been following a diverse cohort of young Americans (mean age 24 at baseline) for over 30 years. As the participants reach midlife, the investigators can now assess how cardiovascular disease risk and preclinical markers beginning in early adulthood (20s and 30s) may affect midlife cognitive functioning and brain aging.

Finally, NIA-supported investigators are determining whether, as with SPRINT-MIND, interventions that improve cardiovascular outcomes can also improve cognition. NIA supports a number of studies of diet and physical activity in diverse populations. In addition, NIA-supported investigators with the Pragmatic Evaluation of Events and Benefits of Lipid-Lowering in Older Adults (PREVENTABLE) Trial are assessing whether lowering cholesterol can prevent MCI, dementia, physical disability, major cardiovascular events or death in adults age 75 and older without cardiovascular disease. These studies will be active in FY 2021.

Major initiatives such as the Accelerating Medicines Partnership for Alzheimer's Disease (AMP-AD), a public-private partnership to identify potential therapeutic targets, and the newly-established Alzheimer's Centers for the Discovery of New Medicines, which will accelerate the characterization and validation of new and untested drug targets for AD/ADRD and move those targets into the drug development pipeline, are speeding the development of new treatments. Investigators with the NIA-supported Alzheimer's Clinical Trial consortium are also working to accelerate and expand clinical trials of AD/ADRD therapies. And NIA's National Strategy for Recruitment and Participation in AD/ADRD Clinical Research and Alzheimer's and Dementia Outreach, Recruitment, and Engagement Resources are ensuring that benefits of participation in NIH-supported AD/ADRD clinical trials are available to all segments of American society.

1989: Thirty years ago, the Alzheimer's Disease Research Centers (ADRC) program was new—only five years old. Ten Centers had been established. Today, 32 geographically diverse Centers not only conduct research but serve as regional and community hubs for diagnosis, treatment, information, and support. As the program has grown, other NIA Centers programs have developed highly specialized Centers within their areas of focus. For example, in 2019, NIA funded four Roybal Centers for Translational Research on Dementia Care Provider Support, and in 2020, the first Centers on the Demography and Economics of AD/ADRD will be established.

1999: Twenty years ago, only four genes (APP and presenilin 1 and presenilin 2 mutations for familial AD and APOE4 for sporadic AD) had been definitively linked to Alzheimer's disease. Today, more than 25 regions of the genome that contain risk factors for late-onset AD, the more common form of the disease, have been identified, and researchers have found more than 60 regions of interest in the genome (loci) with one or more variants that are associated with Alzheimer's. (See "Program Portrait," below).

Program Portrait – Genetics of Alzheimer's Disease

Genes are the cell's "board of directors," conveying instructions to cellular proteins that carry out specific physiological tasks. However, when a gene is somehow irregular— due either to damage from an external agent or to some inborn error—the instructions the proteins receive can be faulty and the cell's functions may be compromised. Disease or physical dysfunction can result. At the same time, some genes appear to

confer resilience against disease, and understanding those genes' roles can help identify targets for protective interventions. Identification of disease-specific risk and protective genes can illuminate the downstream proteins and pathways that are involved in that disease and that may be targets for preventive and treatment interventions.

NIA supports a robust program of research to identify genes that increase both risk of and resilience to Alzheimer's disease and related dementias (AD/ADRD). More than 25 regions of the genome that contain risk factor variants for late-onset AD, the more common form of the disease, have been identified, and researchers have found more than 60 regions of interest in the genome (loci) with one or more variants that are associated with Alzheimer's. This knowledge has strengthened evidence about the involvement of particular pathways in AD/ADRD, such as inflammation, lipid metabolism, and amyloid deposition, and has also suggested some entirely new molecular pathways. Another recent insight: Clusters of risk factors in common pathways with similar function contribute to risk. These "hubs" point toward common functions that are perturbed in AD/ADRD, including the well-known amyloid precursor processing pathway as well as events associated with cholesterol metabolism, neuroinflammation, cellular immunity, and endocytosis (transport of molecules into the cell).

Identification of genes involved in AD/ADRD is a primary focus of the Alzheimer's Disease Sequencing Project (ADSP), a major NIA-supported initiative involving over 100 investigators at dozens of institutions across the country. ADSP investigators are working to identify new risk and protective genes; determining why some people with known risk factor genes don't develop dementia; and using the knowledge to identify new targets for prevention and treatment. Key infrastructure support for NIA-supported genetics research is provided through the NIA Genetics of Alzheimer's Disease Data Storage Site (NIAGADS), the data storage and sharing center for ADSP-related data; the Genome Center for Alzheimer's Disease (GCAD) that performs quality controls and harmonizes all of the ADSP data; as well as the National Centralized Repository for Alzheimer's Disease and Related Dementias (NCRAD), which manages and distributes biospecimens from which genetic data can be derived.

The specific function of many of the unique genetic variants identified by the ADSP remains unknown. Intriguingly, most of these variants have been found in the non-coding regions of the genome—that is, in the parts of the genome that don't directly issue instructions to make proteins in the cell; instead, they are "modifiers" of gene activity. The exact functions of these non-coding regions are largely unknown. In 2019, the National Advisory Council on Aging approved in concept a research solicitation for a new Functional Genomics Program, an arm of the ADSP that will use high-throughput experimental approaches combined with computational methods to determine the function of those variants, potentially suggesting new prevention and treatment targets. Data sharing within the scientific community (with appropriate controls to protect participant privacy) will be rapid and broad. Pending receipt of competitive applications, this ambitious initiative will begin later in FY 2020 and be active in 2021.

2009: Ten years ago, AD could only be definitively diagnosed after death. Today, technology is making visualization of AD's distinctive pathology in real time commonplace in the research setting. NIA also supports research on identification and validation of blood-based biomarkers, potentially making diagnosis possible through a simple blood test at the doctor's office. In addition, improvements in cognitive testing are facilitating earlier and more sensitive detection of potential cognitive decline, and researchers are developing novel early detection paradigms for cognitive decline and dementia, including sensory and motor changes and technologies that track driving behaviors.

2019: Today, an important and emerging focus is on the helping caregivers of patients with AD/ADRD. Research summits on AD/ADRD care and services in 2017 and 2020 have provided inspiration and guidance, and several Funding Opportunity Announcements have generated innovative research. Moving forward, a newly established AD/ADRD Health Care Systems Collaboratory will support pragmatic trials of interventions to improve care both for persons with dementia and for their caregivers.

An exciting development has been NIA's ability to attract new scientists to the field. A recent internal analysis showed that between 2015 and 2018, over a third of NIA's R01[1] or equivalent AD/ADRD awardees had not previously applied for AD/ADRD funding from NIH. Half of these investigators had previously pursued other lines of research. Separately, 25 NIH Institutes and Offices participated in an FY 2018 initiative to award grant supplements to researchers to expand their non-AD/ADRD research programs to incorporate AD/ADRD. More than 300 supplements were awarded, and by 2019 more than a third of supplement awardees had submitted competitive grant applications for AD/ADRD research. NIA is repeating this successful effort. NIA anticipates that the success of these investigators in securing funding will ensure an active pipeline of energetic researchers looking at AD/ADRD from new perspectives for years to come.

Advances in Basic Discovery

Aging itself is the major risk factor for many disabling diseases and conditions, and NIA-supported research is exploring the basic mechanisms through which aging is associated with disease and dysfunction. Among the hallmarks of aging, a particularly promising avenue of research involves cellular senescence, a process in which cells lose function, including the ability to divide and replicate, but continue to secrete molecules that damage neighboring cells. (See Program Portrait, below). NIA anticipates that ongoing research will yield a much more thorough understanding of how and why senescence occurs, how it induces aging-related tissue damage, and how its effects can be forestalled or reversed in disease and physical dysfunction.

Program Portrait: Research on Cellular Senescence and Senolytics

An understanding of aging processes at their most fundamental level is a necessary foundation for discovery of new preventive interventions and cures. For this reason, investment in research on the basic

biology of aging is a high priority for NIA. A particularly promising avenue of research involves cellular senescence, a process in which cells lose the ability to divide and replicate but continue to secrete molecules, which may have beneficial or damaging effects on neighboring cells. NIA-supported investigators are studying the fundamental biology of senescent cells and working to determine the role of cellular senescence in aging processes in various tissues, including the brain, lung, and heart. Other investigators are identifying and validating senescence-related biomarkers to predict and monitor age-related health conditions.

A succession of exciting findings suggests that removal of senescent cells may benefit both length and

[1] Research Project Grants—the basic research grants awarded by NIH.

quality of life. Preclinical research using compounds known as senolytics, which selectively remove senescent cells, has yielded promising results in model systems: Senolytics have been shown to extend lifespan and health span in naturally-aging mice, preserve cognition in a mouse model of Alzheimer's disease, and restore physical function in mice who had previously been injected with damaging senescent cells.

NIA has recently funded a large program project to develop a "pipeline" of therapeutic approaches targeting senescence by elucidating the mechanisms by which senescence influences metabolic dysfunction, bone fragility, vascular dysfunction, and frailty and initiating preclinical testing of senolytic drugs to alleviate these outcomes in rodent models, and some have advanced to early-stage trials in humans. In addition, cellular senescence is one of the mechanisms being targeted through NIA's new Translational Geroscience Network, which was established in 2019 to support and accelerate development of treatments targeting basic aging processes. These activities will be ongoing in FY 2021.

Another emerging area of research is the influence of the microbiome—the internal ecosystem of viruses, bacteria, and fungi that populate our digestive tract and other areas of the body—on aging and aging-related diseases. Imbalance between the microbiome and its host can impact a broad range of conditions across organ systems. NIA has solicited research on the factors that influence microbiome composition and functional characteristics during aging, understanding how the aging microbiome relates to the causes and pathophysiology of age-related chronic diseases, and development and testing of interventions targeting the microbiota.

NIA also supports an extensive portfolio of basic behavioral and social research. An emerging area of research emphasis is the impact of social connectedness or isolation on health. Research has shown that having strong social ties can facilitate overall wellbeing, recovery from acute illness, and self-management of chronic conditions. For example, NIA-supported investigators recently analyzed data from the Whitehall II study and found that frequent social contact during midlife may reduce dementia risk. On the other hand, social isolation and loneliness are associated with a variety of physical and mental conditions, including high blood pressure, heart disease, obesity, immune dysfunction, anxiety, depression, cognitive decline and dementia, and even death. However, researchers don't fully understand the mechanisms behind this phenomenon. NIA is currently soliciting applications for research to uncover the underlying mechanisms, processes, and trajectories of social relationships—including relationships mediated via social media use.

Clinical and Translational Research: Turning Yesterday's Basic Discovery Into Tomorrow's Cures

NIA's Translational Geroscience Network (see Program Portrait, Research on Cellular Senescence and Senolytics) is transforming approaches to age-related disease and disability by targeting fundamental aging processes in the context of several age-related diseases. In addition, NIA supports clinical trials of interventions for a range of diseases and conditions, including cardiovascular diseases, osteoporosis, arthritis, cancer, and pain. To support the clinical research enterprise, NIA has established the NIA Clinical Research Toolbox, a comprehensive information repository for investigators and staff involved in clinical research. In addition, NIA has partnered with the Centers for Disease Control and Prevention and the Administration for Community Living to develop the Recruiting Older Adults into Research (ROAR) toolkit, which

contains materials to facilitate participation of older adults and their family caregivers, including underrepresented populations, to consider participation in clinical research. Initial focus has been on AD/ADRD research, but the resources are customizable for other health conditions. Materials are available in English, Spanish, and Chinese. Also supporting NIA's clinical trials effort is the National Strategy for Recruitment and Participation in Alzheimer's Research, which was launched in 2018 to help ensure that individuals from diverse populations have access to participation in NIA-supported research on AD/ADRD. In 2019, NIA launched a repository of resources to support recruitment and retention of participants. These activities will remain active during FY 2021.

Nurturing the Next Generation of Researchers

Finally, NIA is preparing for the future through the establishment and support of a diverse and talented biomedical workforce. NIA supports training awards for both individuals and institutions, including some awards specifically for training in research relevant to AD/ADRD. NIA's Intramural Research Program offers training for promising scientists from high school through the postdoctoral years. The Paul B. Beeson Emerging Leaders Career Development Awards foster the careers of exceptionally talented clinical investigators who are pursuing academic leadership in aging and geriatrics. The Butler-Williams Program is a week-long "boot camp" for emerging investigators in aging, including those who specialize in topics relevant to aging of special populations, that provides intensive instruction on grantsmanship and the application process at NIA. Finally, the Grants for Early Medical and Surgical Specialists' Transition to Aging Research (GEMSSTAR) program awards small grants to enable early stage physician-scientists to get a "foot in the door" in research related to aging in their specialty area.

Overall Budget Policy:
The FY 2021 President's Budget request is $3,225.8 million, a decrease of $320.1 million or 9 percent below the FY 2020 Enacted level.

Program Descriptions

Division of Aging Biology

Aging is a primary risk factor for many diseases and frailties. The NIA Division of Aging Biology (DAB) supports research to determine the basic biochemical and genetic mechanisms underlying the processes of aging at the cell, tissue, and organ levels and the ways these are communicated among cells and tissues of the body. DAB-supported investigators study the changes in molecular and cellular structures and functions that characterize normal aging in diverse laboratory organisms, spanning yeast to nonhuman primates, and where the opportunities arise in humans. The Division also supports research on the mechanisms and interventions that increase or decrease the rate of aging, including in natural human variants such as persons with progeroid syndromes, who display signs of premature physical aging, and centenarians (or their laboratory equivalents). Importantly, DAB is initiating programs into the basic biology of aging in disadvantaged and minority populations.

DAB coordinates the groundbreaking trans-NIH GeroScience Interest Group (GSIG). Under the hypothesis that slowing the rate of aging will have a beneficial impact on many health parameters, GSIG promotes studies into the interactions between the biology of aging and the biology of diseases and age-related loss of resilience. Most NIH Institutes participate in the GSIG, engaging in outreach to scientific societies, the pharmaceutical industry, and experts in emerging biotechnology. The GSIG has held three Summits to generate scientific ideas and momentum in the field, the most recent of which was in November 2019.

DAB-supported researchers have made important discoveries in exercise, dietary regimens and other interventions that impact laboratory animals, with potential for translation into practical ways of improving health in humans. DAB supports the (mouse) Intervention Testing Program and the *Caenorhabditis* Intervention Testing Program. Both programs test the effectiveness and reproducibility of interventions on extending lifespan and enhancing functions at older ages– including foods, hormones, and pharmaceuticals. To date, six compounds have shown significant efficacy in mice — most showing differences between males and females. Both programs encourage collaborations to identify the mechanisms by which these compounds extend life and improve health. NIA-supported investigators are now studying some of these interventions (and others, as scientifically appropriate) in models of AD/ADRD to determine their effects on the diseases' pathogenesis and progression.

The Nathan Shock Centers of Excellence, which provides national leadership and research resources in the basic biology of aging, will undergo recompetition and renewal in FY 2020. DAB also supports selected resources for biology of aging research, including colonies of aging rodents, collections of cells derived from rodent, non-human primate and human longitudinal studies of aging, and from individuals affected by premature aging disorders. All these programs will remain active in FY 2021.

Budget Policy:
The FY 2021 President's Budget request is $322.6 million, a decrease of $32.2 million or 9.1 percent below the FY 2020 Enacted level.

Division of Behavioral and Social Research

The NIA Division of Behavioral and Social Research (DBSR) supports research investigating the social, economic and behavioral implications of aging at both the individual and societal level. DBSR's portfolio is broad, spanning topics ranging from the genetics of age-related behavior change to sweeping demographic studies with global reach, and including such research areas as age-related changes in cognition, mood, and behavior; the implications of aging on families and family systems; the psychology of aging; financial and public policy issues that affect older Americans; and studies of aging around the world.

Notably, DBSR supports the Health and Retirement Study (HRS), the nation's leading source of combined data on health and socioeconomic circumstances of Americans over age 50. Researchers have used HRS data to calculate life expectancy and disability trends and to estimate the costs, both to the individual and to society, of age-related diseases and conditions. Over 30 countries across five continents have designed surveys to be comparable with the HRS,

facilitating cross-national comparisons across a wide variety of parameters. In 2018, the HRS implemented a Harmonized Cognitive Assessment Protocol (HCAP) to measure and understand dementia risk. Local versions of the HCAP are being implemented in England, continental Europe, India, Mexico, China, and South Africa, and several other countries have expressed interest. This new tool provides the research community with rich data to study the prevalence, predictors, outcomes and future trends in cognitive functioning and dementia on a global scale.

DBSR supports other longitudinal studies focusing on trends in late life disability (National Health and Aging Trends Study[2]) and on the influences of behavioral, psychological, and social factors in midlife on age-related variations in health and well-being (Midlife in the United States Study).[3] The program also coordinates several active Centers programs. Centers on the Demography and Economics of Aging will be renewed in FY 2020, with the addition of new Centers on Demography and Economics of Alzheimer's Disease and Related Dementias (AD/ADRD). The Edward R. Roybal Centers for Translational Research on Aging were renewed in FY 2019, and the Resource Centers for Minority Aging Research (RCMARs) continue their research in priority areas of social, behavioral, and economic research on the processes of aging at the individual and societal levels.

In recent years, the DBSR portfolio has increased its focus on dementia care research, especially health and long-term care services, research on support for caregivers, and epidemiology and prevention of AD/ADRD. The first National Research Summit on Care, Services, and Supports for Persons with Dementia and Their Caregivers,[4] led by DBSR in partnership with the DHHS Office of Women's Health and the Office of the Assistant Secretary for Planning and Evaluation, was held in 2017; the second is scheduled for March 2020. In addition, DBSR leads a new effort designed to test care interventions in real-world settings, the Imbedded Pragmatic AD/ADRD Clinical Trials (IMPACT) Collaboratory. Under this initiative, researchers will team with scientists at other universities with health care and long-term care systems to guide research to develop and test novel ways to care for people with AD/ADRD.

A new DBSR-led initiative, which will be active in FY 2021, is support for development of personalized interventions, based on insights from electronic health records and other data sources, to increase use of preventive health care and screening—for example, recommended cancer screenings or flu vaccinations—among older adults. An important component of this initiative is an emphasis on interventions that address disparities in screening and care. This two-phase initiative will begin with a one- to two-year planning phase with concrete milestones built in. Projects that meet their milestones will move on to an implementation phase, contingent on availability of funding.

Budget Policy:
The FY 2021 President's Budget request is $449.6 million, a decrease of $44.8 million or 9.1 percent below the FY 2020 Enacted level.

[2] www.nhats.org/
[3] midus.wisc.edu/
[4] aspe.hhs.gov/national-research-summit-care-services-and-supports-persons-dementia-and-their-caregivers

Division of Geriatrics and Clinical Gerontology

The Division of Geriatrics and Clinical Gerontology (DGCG) promotes clinical and translational research on health and disease in the aged, as well as research on aging over the human life span. In particular, DGCG supports clinical trials on the effectiveness of interventions in clinical settings, translational research for the development of new interventions for age-related conditions, prevention and treatment of multiple chronic conditions in the elderly, and studies that help to promote evidence-based geriatric care that inform policies affecting older adults.

DGCG-supported research encompasses a range of age-related diseases and conditions, including AD/ADRD. For example, DGCG partners with the NIA Divisions of Neuroscience and Behavioral and Social Research to support research on the intriguing phenomenon known as "paradoxical lucidity," or a sudden and unexpected return to cognitive lucidity in patients with severe dementia, usually close to the time of death. A better understanding of this apparent transient reversal of dementia may provide powerful new information about brain function and point toward potential treatments for AD/ADRD. Two Funding Opportunity Announcements (FOAs) have been issued on this topic, and projects will be active in FY 2021. Elsewhere, investigators supported by DGCG and the National Institute on Diabetes and Digestive and Kidney Diseases recently developed the innovative Liver Frailty Index, which identifies cirrhosis patients at highest risk of death and may help guide those people and their caregivers to consider accelerated transplant options.

A different DGCG-supported FOA will support development of a collaborative research and resource network to address research gaps toward optimizing recognition and emergency care of older adults with AD/ADRD, who may be particularly vulnerable in that setting to misdiagnosis, inappropriate tests or treatments, inability to provide informed consent to treatment, and unsafe discharge. This new network will be active in FY 2021.

DGCG also supports research on multifactorial geriatric syndromes such as falls, frailty, and various types of disability; determinants of rates of progression of age-related changes that affect disease risk; and complications of multiple ailments. Other research includes the development of new interventions for age-related conditions, prevention, and treatment of multiple chronic conditions in the aged. Recent DGCG Funding Opportunity Announcements have solicited applications on palliative care, aging in older persons with HIV/AIDS, and possible effects of the commonly prescribed diabetes drug metformin on the aging process. Studies under these FOAs will be active in FY 2021.

DGCG also coordinates the Claude D. Pepper Older Americans Independence Centers Program, which supports research to identify effective methods to maintain or restore independence in older adults. Funding for this important program was renewed in FY 2018, and the Centers will be active in FY 2021. Finally, this Division provides critical research resources to the scientific community, including the Aging Research BioBank, a unique platform for sharing data and biospecimens, and a web-based "toolbox" for NIH-supported investigators and staff involved in clinical research.

Budget Policy:
The FY 2021 President's Budget request is $299.2 million, a decrease of $29.8 million or 9.1 percent below the FY 2020 Enacted level.

Division of Neuroscience (DN)

The Division of Neuroscience (DN) at NIA supports basic, clinical, and epidemiologic research and training to further understanding of both normal and pathological age-related changes to the nervous system and the influence of these changes on cognition and behavior.

A primary focus is research on Alzheimer's disease and related forms of dementia (AD/ADRD), in support of the goal, articulated in the National Plan to Address AD/ADRD, of treating or preventing these diseases by 2025. The Division supports studies to understand AD/ADRD's molecular, cellular, and genetic underpinnings; biomarker discovery and validation; epidemiological studies to establish prevalence and incidence estimates and identify risk factors; and drug discovery, development, and testing.

In recent years, NIA has supported targeted AD/ADRD research which has facilitated significant progress in the field. For example:

- In 2018 alone, the number of genetic risk factors found to be implicated in AD was larger than what had been identified in all previous years combined. (See Program Portrait, Genetics of Alzheimer's Disease)
- Using powerful imaging tools, NIA-supported scientists have revealed the intricate structure of the tau protein, which is implicated in AD and other forms of dementia. These findings may lead to the development of new interventions targeting tau.
- As new biomarkers are identified and technology is refined, a blood-based diagnostic test for AD is coming closer to fruition.
- NIA's signature Accelerating Medicines Partnership-AD program has identified and widely shared data on 100 candidate drug targets, potentially accelerating the development of new drugs.
- The results of the SPRINT-MIND trial (see Program Portrait, SPRINT-MIND) provide the strongest evidence to date for the possibility of preventing or delaying the onset of dementia.

NIA supports research on the neuroscience of aging and its impact on the development of AD. For example, ongoing and recent research initiatives include investigation of the possibility of an infectious etiology of AD, understanding senescence in brain aging and AD, clarifying the relationship between delirium and AD/ADRD, and common mechanisms and interactions among neurodegenerative diseases. NIH currently supports over 200 clinical trials on a range of interventions aimed at treating or preventing AD/ADRD, addressing neuropsychiatric symptoms of dementia, and supporting dementia caregivers.

NIA supports a national network of 32 AD centers that work to translate research discoveries into AD diagnostics and treatment interventions, as well as executing a wide range of studies to

enhance understanding of AD. Current and new Centers are funded via a competitive review process, with the next round of review and funding anticipated for FY 2020.

In addition to studies of Alzheimer's disease and related dementias, DN supports basic and clinical research aimed at maintaining or improving cognitive health, sleep, and sensory and motor function with age. Ongoing research includes studies of possible associations between disrupted sleep and cognitive decline and AD in older age; studies of sleep disorders in older Americans; and studies exploring alterations in blood flow in the brain as a possible contributor to gait dysfunction and falls. For example, recognizing that hearing loss is not only a common condition among older adults but that it is also connected to a higher risk of dementia, NIA recently funded the Aging, Cognition, and Hearing Evaluation in Elders (ACHIEVE) clinical trial. The study aims to examine the potential of hearing rehabilitation to reduce rates of cognitive decline and will be active in FY 2021.

Budget Policy:
The FY 2021 President's Budget request is $1,847.5 million, a decrease of $184.2 million or 9.1 percent below the FY 2020 Enacted level.

Intramural Research Program (IRP)

The NIA Intramural Research Program (IRP) supports basic, behavioral, clinical, epidemiologic, and translational research with the goal of understanding the physiological changes and adaptability of the human body in response to age and stress. Knowledge about the biology of aging and chronic disease is necessary to develop new effective interventions that reduce the burden of disease and disability in the older population, and IRP investigators use this understanding to clarify the pathophysiology of age-related diseases and create new therapeutics and interventions for these conditions. While IRP's 10 laboratories each focuses on specific areas of research, they share the common goal of expanding our knowledge of the aging process and age-related disease and collaborate in these efforts.

IRP investigators conduct research in three main focus areas: aging biology, neuroscience, and translational gerontology. Specific areas of interest include 1) epidemiologic research, such as investigations into neurologic and blood biomarkers, population diversity, health disparities, body composition, cognition, frailty, and disabilities; 2) behavioral research including studies on neuropsychology, cognition, and personality; 3) genetics and genomics, including genetic and epigenetic causes of aging and transcriptional regulation; 4) clinical and translational research in drug development, treatment efficacy, and treatment toxicity as well as immunology, cardiology, neurology, and other topics; and 5) neuroscience and neurogenetics, with a focus on declining cognition due to age-related physiologic and molecular changes and genetic determinants. Age-associated diseases that are priority areas of research include AD/ADRD, Parkinson's disease, diabetes, cardiovascular diseases, stroke, osteoporosis and osteoarthritis, autoimmune diseases such as multiple sclerosis and lupus, and cancers.

IRP's longitudinal cohort studies have contributed greatly to aging research. Prominent studies include the trailblazing Baltimore Longitudinal Study of Aging[5] (BLSA), which looks at the

[5] www.blsa.nih.gov/

determinants and measures of healthy biological aging over time and is the nation's longest running scientific study of human aging; the Healthy Aging in Neighborhoods of Diversity across the Life Span (HANDLS) study,[6] which looks at the impact of racial and socioeconomic diversity on health disparities and healthy aging; and the Genetic and Epigenetic Signatures of Translational Aging Laboratory Testing (GESTALT) study,[7] which is aimed at discovering biomarkers and their connections to aging.

IRP also supports training programs for students and recent graduates that give young scientists the opportunity to learn skills in basic and clinical aging research in the biomedical and behavioral sciences. This may help combat the nation's unmet need for aging and geriatric researchers and clinician-scientists.

Budget Policy:
The FY 2021 President's Budget request is $221.5 million, a decrease of $24.6 million or 10.0 percent below the FY 2020 Enacted level.

Research Management and Support

NIA Research Management Support (RMS) activities provide administrative, budgetary, logistical, and scientific support in the review, award, and monitoring of research grants, training awards and research and development contracts. RMS functions also encompass strategic planning, coordination, and evaluation of the Institute's programs, regulatory compliance, international coordination, and liaison with other Federal agencies, Congress, and the public. In FY 2019, the Institute monitored 3,295 research grants as well as 657 full-time and training positions and 57 research and support contracts.

Budget Policy:
The FY 2021 President's Budget request is $85.4 million, a decrease of $4.5 million or 5 percent below the FY 2020 Enacted level.

[6] handls.nih.gov/
[7] www.nia.nih.gov/alzheimers/clinical-trials/genetic-and-epigenetic-signatures-translational-aging-laboratory-testing

NATIONAL INSTITUTES OF HEALTH
National Institute on Aging

Budget Authority by Object Class[1]

(Dollars in Thousands)

		FY 2020 Enacted	FY 2021 President's Budget	FY 2021 +/- FY 2020
Total compensable workyears:				
	Full-time equivalent	435	435	0
	Full-time equivalent of overtime and holiday hours	0	0	0
	Average ES salary	$197	$197	$0
	Average GM/GS grade	12.3	12.3	0.0
	Average GM/GS salary	$115	$117	$2
	Average salary, grade established by act of July 1, 1944 (42 U.S.C. 207)	$127	$131	$4
	Average salary of ungraded positions	$151	$151	$0
	OBJECT CLASSES	**FY 2020 Enacted**	**FY 2021 President's Budget**	**FY 2021 +/- FY 2020**
	Personnel Compensation			
11.1	Full-Time Permanent	38,753	39,198	445
11.3	Other Than Full-Time Permanent	16,058	16,243	185
11.5	Other Personnel Compensation	1,295	1,310	15
11.7	Military Personnel	385	395	10
11.8	Special Personnel Services Payments	9,002	9,105	104
11.9	**Subtotal Personnel Compensation**	**$65,493**	**$66,251**	**$758**
12.1	Civilian Personnel Benefits	20,122	20,906	784
12.2	Military Personnel Benefits	388	399	10
13.0	Benefits to Former Personnel	0	0	0
	Subtotal Pay Costs	**$86,003**	**$87,555**	**$1,552**
21.0	Travel & Transportation of Persons	1,815	1,643	-171
22.0	Transportation of Things	288	264	-24
23.1	Rental Payments to GSA	0	0	0
23.2	Rental Payments to Others	0	0	0
23.3	Communications, Utilities & Misc. Charges	1,238	1,117	-121
24.0	Printing & Reproduction	0	0	0
25.1	Consulting Services	1,175	1,078	-96
25.2	Other Services	37,320	35,086	-2,234
25.3	Purchase of goods and services from government accounts	206,170	203,507	-2,663
25.4	Operation & Maintenance of Facilities	2,790	2,792	2
25.5	R&D Contracts	30,937	28,848	-2,090
25.6	Medical Care	9,182	8,840	-341
25.7	Operation & Maintenance of Equipment	4,818	4,423	-395
25.8	Subsistence & Support of Persons	0	0	0
25.0	**Subtotal Other Contractual Services**	**$292,391**	**$284,574**	**-$7,817**
26.0	Supplies & Materials	28,646	26,297	-2,349
31.0	Equipment	27,674	25,405	-2,269
32.0	Land and Structures	39,111	23,537	-15,574
33.0	Investments & Loans	0	0	0
41.0	Grants, Subsidies & Contributions	3,068,702	2,775,390	-293,313
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	**$3,459,866**	**$3,138,227**	**-$321,639**
	Total Budget Authority by Object Class	**$3,545,869**	**$3,225,782**	**-$320,087**

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

NATIONAL INSTITUTES OF HEALTH
National Institute on Aging

Salaries and Expenses

(Dollars in Thousands)

OBJECT CLASSES	FY 2020 Enacted	FY 2021 President's Budget	FY 2021 +/- FY 2020
Personnel Compensation			
Full-Time Permanent (11.1)	$38,753	$39,198	$445
Other Than Full-Time Permanent (11.3)	16,058	16,243	185
Other Personnel Compensation (11.5)	1,295	1,310	15
Military Personnel (11.7)	385	395	10
Special Personnel Services Payments (11.8)	9,002	9,105	104
Subtotal Personnel Compensation (11.9)	**$65,493**	**$66,251**	**$758**
Civilian Personnel Benefits (12.1)	$20,122	$20,906	$784
Military Personnel Benefits (12.2)	388	399	10
Benefits to Former Personnel (13.0)	0	0	0
Subtotal Pay Costs	**$86,003**	**$87,555**	**$1,552**
Travel & Transportation of Persons (21.0)	$1,815	$1,643	-$171
Transportation of Things (22.0)	288	264	-24
Rental Payments to Others (23.2)	0	0	0
Communications, Utilities & Misc. Charges (23.3)	1,238	1,117	-121
Printing & Reproduction (24.0)	0	0	0
Other Contractual Services:			
Consultant Services (25.1)	1,175	1,078	-96
Other Services (25.2)	37,320	35,086	-2,234
Purchases from government accounts (25.3)	118,872	111,138	-7,735
Operation & Maintenance of Facilities (25.4)	2,790	2,792	2
Operation & Maintenance of Equipment (25.7)	4,818	4,423	-395
Subsistence & Support of Persons (25.8)	0	0	0
Subtotal Other Contractual Services	**$164,975**	**$154,517**	**-$10,458**
Supplies & Materials (26.0)	$28,646	$26,297	-$2,349
Subtotal Non-Pay Costs	**$196,962**	**$183,838**	**-$13,124**
Total Administrative Costs	**$282,965**	**$271,393**	**-$11,572**

NATIONAL INSTITUTES OF HEALTH
National Institute on Aging

Detail of Full-Time Equivalent Employment (FTE)

OFFICE/DIVISION	FY 2019 Final			FY 2020 Enacted			FY 2021 President's Budget		
	Civilian	Military	Total	Civilian	Military	Total	Civilian	Military	Total
Division of Aging Biology									
Direct:	15	-	15	15	-	15	15	-	15
Reimbursable:	-	-	-	-	-	-	-	-	-
Total:	15	-	15	15	-	15	15	-	15
Division of Behavioral & Social Research									
Direct:	16	-	16	17	-	17	17	-	17
Reimbursable:	-	-	-	-	-	-	-	-	-
Total:	16	-	16	17	-	17	17	-	17
Division of Extramural Affairs									
Direct:	46	-	46	49	-	49	49	-	49
Reimbursable:	-	-	-	-	-	-	-	-	-
Total:	46	-	46	49	-	49	49	-	49
Division of Geriatrics & Clinical Gerontology									
Direct:	15	-	15	15	-	15	15	-	15
Reimbursable:	-	-	-	-	-	-	-	-	-
Total:	15	-	15	15	-	15	15	-	15
Division of Neuroscience									
Direct:	32	-	32	38	-	38	38	-	38
Reimbursable:	-	-	-	-	-	-	-	-	-
Total:	32	-	32	38	-	38	38	-	38
Intramural Research Program									
Direct:	225	3	228	232	3	235	232	3	235
Reimbursable:	-	-	-	-	-	-	-	-	-
Total:	225	3	228	232	3	235	232	3	235
Office of Administrative Management									
Direct:	40	-	40	41	-	41	41	-	41
Reimbursable:	-	-	-	-	-	-	-	-	-
Total:	40	-	40	41	-	41	41	-	41
Office of the Director									
Direct:	25	-	25	25	-	25	25	-	25
Reimbursable:	-	-	-	-	-	-	-	-	-
Total:	25	-	25	25	-	25	25	-	25
Total	414	3	417	432	3	435	432	3	435
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
2017	12.0
2018	12.1
2019	12.2
2020	12.3
2021	12.3

NATIONAL INSTITUTES OF HEALTH
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Detail of Positions[1]

GRADE	FY 2019 Final	FY 2020 Enacted	FY 2021 President's Budget
Total, ES Positions	1	1	1
Total, ES Salary	192,254	197,300	197,300
GM/GS-15	47	49	49
GM/GS-14	58	61	61
GM/GS-13	91	96	96
GS-12	56	58	58
GS-11	28	29	29
GS-10	0	0	0
GS-9	34	35	35
GS-8	4	4	4
GS-7	12	13	13
GS-6	1	1	1
GS-5	6	6	6
GS-4	2	2	2
GS-3	0	0	0
GS-2	0	0	0
GS-1	0	0	0
Subtotal	339	354	354
Grades established by Act of July 1, 1944 (42 U.S.C. 207)			
Assistant Surgeon General	0	0	0
Director Grade	2	2	2
Senior Grade	1	1	1
Full Grade	0	0	0
Senior Assistant Grade	0	0	0
Assistant Grade	0	0	0
Subtotal	3	3	3
Ungraded	101	105	105
Total permanent positions	338	350	350
Total positions, end of year	444	463	463
Total full-time equivalent (FTE) employment, end of year	417	435	435
Average ES salary	192,254	197,300	197,300
Average GM/GS grade	12.2	12.3	12.3
Average GM/GS salary	111,707	114,835	116,592

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