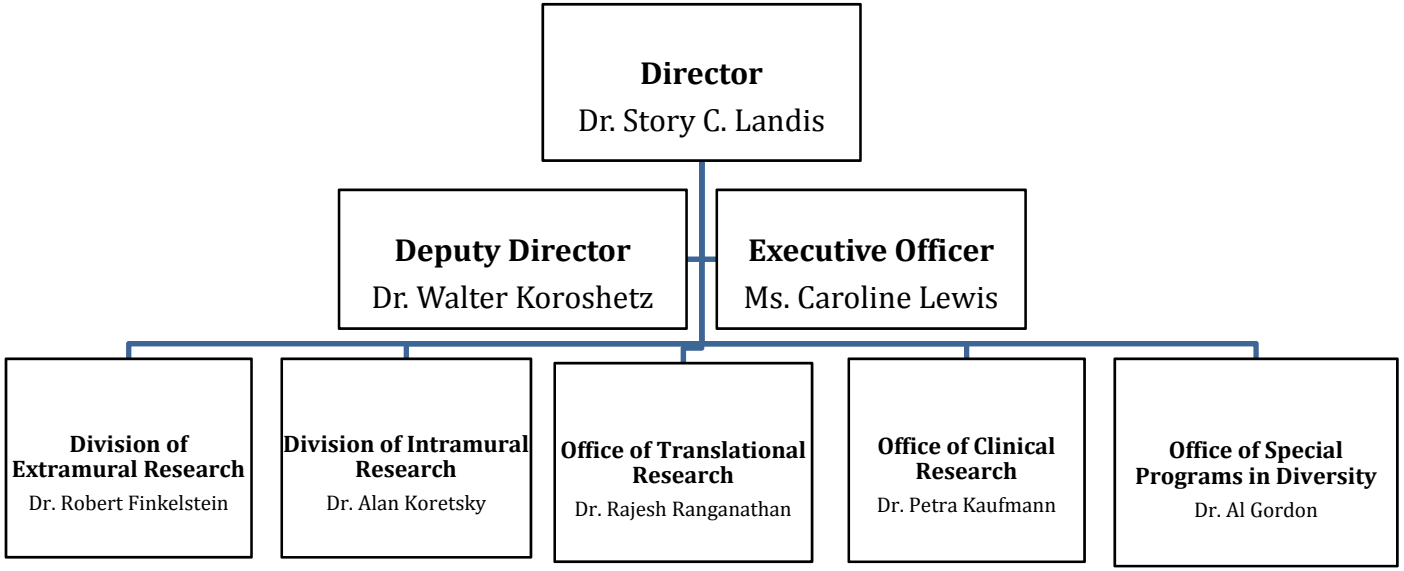
DEPARTMENT OF HEALTH AND HUMAN SERVICES
NATIONAL INSTITUTES OF HEALTH

National Institute of Neurological Disorders and Stroke (NINDS)

NATIONAL INSTITUTES OF HEALTH

National Institute of Neurological Disorders and Stroke

Organizational Chart



NATIONAL INSTITUTES OF HEALTH

National Institute of Neurological Disorders and Stroke

For carrying out section 301 and title IV of the PHS Act with respect to neurological disorders and stroke, [$1,587,982,000] *$1,608,461,000*.

NATIONAL INSTITUTES OF HEALTH
National Institute of Neurological Disorders and Stroke

Amounts Available for Obligation[1]
(Dollars in Thousands)

Source of Funding	FY 2013 Actual	FY 2014 Enacted	FY 2015 President's Budget
Appropriation	$1,626,365	$1,587,982	$1,608,461
Type 1 Diabetes	0	0	0
Rescission	-3,253	0	0
Sequestration	-81,632	0	0
Subtotal, adjusted appropriation	$1,541,480	$1,587,982	$1,608,461
FY 2013 Secretary's Transfer	-8,992	0	0
OAR HIV/AIDS Transfers	0	0	0
Comparative transfers to NLM for NCBI and Public Access	-1,821	-2,185	0
National Children's Study Transfers	1,307	0	0
Subtotal, adjusted budget authority	$1,531,975	$1,585,797	$1,608,461
Unobligated balance, start of year	0	0	0
Unobligated balance, end of year	0	0	0
Subtotal, adjusted budget authority	$1,531,975	$1,585,797	$1,608,461
Unobligated balance lapsing	-2	0	0
Total obligations	$1,531,972	$1,585,797	$1,608,461

[1] Excludes the following amounts for reimbursable activities carried out by this account:
FY 2013 - $8,727 FY 2014 - $8,531 FY 2015 - $8,751

NATIONAL INSTITUTES OF HEALTH
National Institute of Neurological Disorders and Stroke

Budget Mechanism - Total[1]

(Dollars in Thousands)

MECHANISM	FY 2013 Actual		FY 2014 Enacted[2]		FY 2015 President's Budget		FY 2015 +/- FY 2014	
	No.	Amount	No.	Amount	No.	Amount	No.	Amount
Research Projects:								
Noncompeting	1,928	$742,140	1,861	$789,513	1,881	$787,587	20	-$1,926
Administrative Supplements	*(82)*	11,866	*(70)*	10,000	*(70)*	10,000	*(0)*	0
Competing:								
Renewal	162	75,360	171	66,681	171	66,681	0	0
New	540	192,195	559	209,789	596	224,034	37	14,245
Supplements	0	0	0	0	0	0	0	0
Subtotal, Competing	702	$267,555	730	$276,470	767	$290,715	37	$14,245
Subtotal, RPGs	2,630	$1,021,561	2,591	$1,075,983	2,648	$1,088,302	57	$12,319
SBIR/STTR	77	39,756	88	44,331	92	46,439	4	2,108
Research Project Grants	2,707	$1,061,317	2,679	$1,120,314	2,740	$1,134,741	61	$14,427
Research Centers:								
Specialized/Comprehensive	68	$71,211	58	$64,802	77	$64,802	19	$0
Clinical Research	0	0	0	0	0	0	0	0
Biotechnology	0	0	0	0	0	0	0	0
Comparative Medicine	0	660	0	691	0	691	0	0
Research Centers in Minority Institutions	0	0	0	0	0	0	0	0
Research Centers	68	$71,871	58	$65,493	77	$65,493	19	$0
Other Research:								
Research Careers	205	$35,831	199	$35,831	199	$35,831	0	$0
Cancer Education	0	0	0	0	0	0	0	0
Cooperative Clinical Research	112	24,893	111	25,122	111	25,122	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	104	15,937	105	15,913	105	15,913	0	0
Other Research	421	$76,661	415	$76,866	415	$76,866	0	$0
Total Research Grants	3,196	$1,209,849	3,152	$1,262,673	3,232	$1,277,100	80	$14,427
Ruth L Kirchstein Training Awards:	FTTPs		FTTPs		FTTPs		FTTPs	
Individual Awards	413	$16,539	413	$17,002	413	$17,342	0	$340
Institutional Awards	338	14,750	330	15,134	330	15,331	0	197
Total Research Training	751	$31,289	743	$32,136	743	$32,673	0	$537
Research & Develop. Contracts	105	$80,680	102	$72,931	102	$81,876	0	$8,945
(SBIR/STTR) (non-add)	*(0)*	*(265)*	*(3)*	*(265)*	*(3)*	*(265)*	*(0)*	*(0)*
Intramural Research	334	152,766	334	155,919	334	157,478	0	1,559
Res. Management & Support	191	57,391	191	58,152	191	59,334	0	1,182
Res. Management & Support (SBIR Admin) (non-add)	*(0)*	*(612)*	*(0)*	*(612)*	*(0)*	*(612)*	*(0)*	*(0)*
Construction		0		0		0		0
Buildings and Facilities		0		0		0		0
Total, NINDS	525	$1,531,975	525	$1,585,797	525	$1,608,461	0	$22,664

[1] All items in italics and brackets are non-add entries. FY 2013 and FY 2014 levels are shown on a comparable basis to FY 2015.

[2] The amounts in the FY 2014 column take into account funding reallocations, and therefore may not add to the total budget authority reflected herein.

Major Changes in the Fiscal Year 2015 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 2015 President's Budget for NINDS, which is $22.664 million more than the FY 2014 level, for a total of $1,608.461 million.

Research Project Grants (+$14.427 million, total $1,134.741 million):
NINDS will support a total of 2740 Research Project Grant (RPG) awards in FY 2015. Noncompeting RPGs will increase by 20 awards and decrease by $1.926 million. Competing RPGs will increase by 37 awards and $14.245 million.

Research Training (+$0.537 million, total $32.673 million):
NIH will provide an increase of two percent over FY 2014 for stipend levels for pre-doctoral and post-doctoral trainees. The requested increase will help sustain the development of a highly qualified biomedical research workforce.

NATIONAL INSTITUTES OF HEALTH
National Institute of Neurological Disorders and Stroke

Summary of Changes[1]

(Dollars in Thousands)

FY 2014 Enacted				$1,585,797
FY 2015 President's Budget				$1,608,461
Net change				$22,664
CHANGES	**FY 2015 President's Budget**		**Change from FY 2014**	
	FTEs	**Budget Authority**	**FTEs**	**Budget Authority**
A. Built-in:				
1. Intramural Research:				
a. Annualization of January 2014 pay increase & benefits		$51,950		$128
b. January FY 2015 pay increase & benefits		51,950		384
c. Zero more days of pay (n/a for 2015)		51,950		0
d. Differences attributable to change in FTE		51,950		0
e. Payment for centrally furnished services		26,470		442
f. Increased cost of laboratory supplies, materials, other expenses, and non-recurring costs		79,058		337
Subtotal				$1,291
2. Research Management and Support:				
a. Annualization of January 2014 pay increase & benefits		$27,383		$67
b. January FY 2015 pay increase & benefits		27,383		202
c. Zero more days of pay (n/a for 2015)		27,383		0
d. Differences attributable to change in FTE		27,383		0
e. Payment for centrally furnished services		7,155		120
f. Increased cost of laboratory supplies, materials, other expenses, and non-recurring costs		24,796		642
Subtotal				$1,031
Subtotal, Built-in				$2,322

NATIONAL INSTITUTES OF HEALTH
National Institute of Neurological Disorders and Stroke

Summary of Changes - Continued[1]

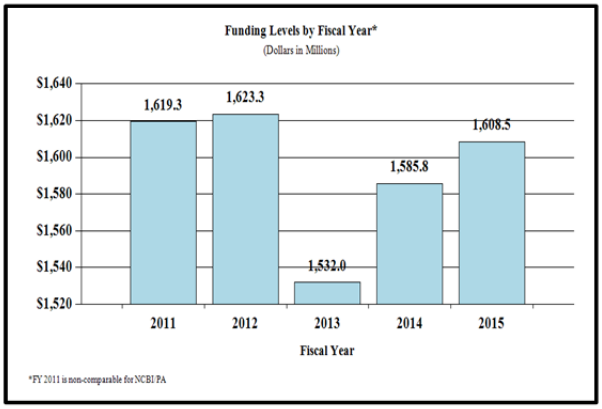
(Dollars in Thousands)

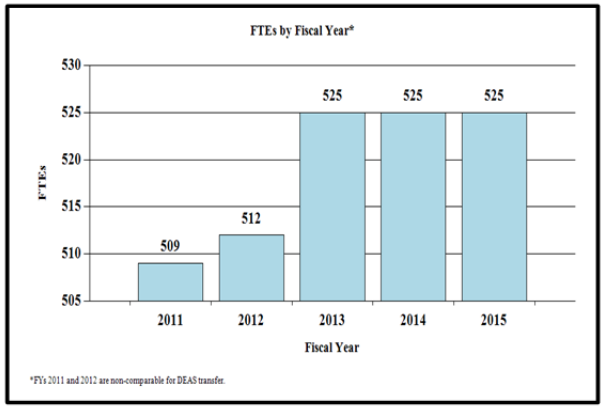
CHANGES	FY 2015 President's Budget		Change from FY 2014	
	No.	Amount	No.	Amount
B. Program:				
1. Research Project Grants:				
a. Noncompeting	1,881	$797,587	20	-$1,926
b. Competing	767	290,715	37	14,245
c. SBIR/STTR	92	46,439	4	2,108
Subtotal, RPGs	2,740	$1,134,741	61	$14,427
2. Research Centers	77	$65,493	19	$0
3. Other Research	415	76,866	0	0
4. Research Training	743	32,673	0	537
5. Research and development contracts	102	81,876	0	8,945
Subtotal, Extramural		$1,391,649		$23,909
	FTEs		FTEs	
6. Intramural Research	334	$157,478	0	$268
7. Research Management and Support	191	59,334	0	151
8. Construction		0		0
9. Buildings and Facilities		0		0
Subtotal, Program	525	$1,608,461	0	$24,328
Total changes				$22,664

[1] The amounts in the Change from FY 2014 column take into account funding reallocations, and therefore may not add to the net change reflected herein.

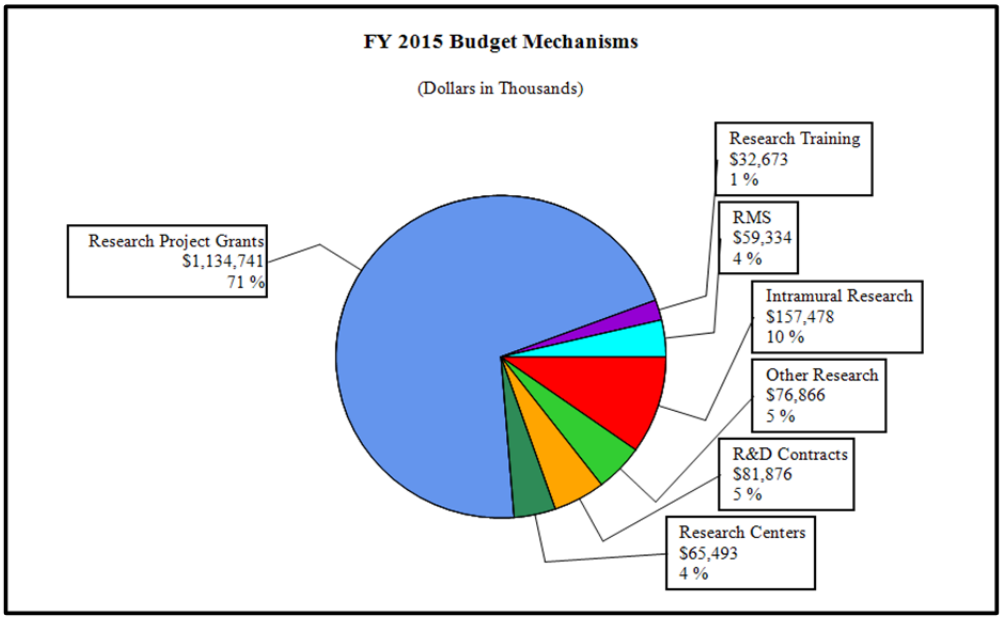
Fiscal Year 2015 Budget Graphs

History of Budget Authority and FTEs:

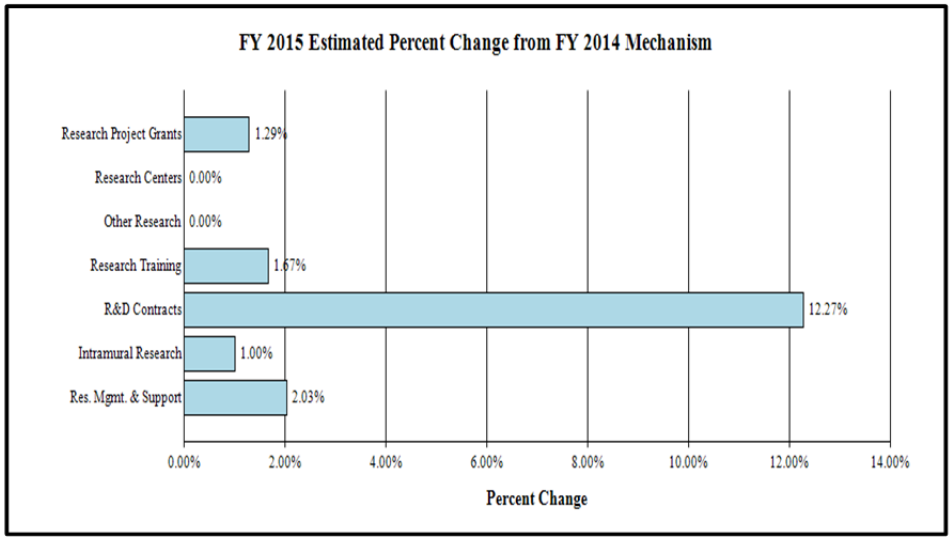




Distribution by Mechanism:



Change by Selected Mechanism:



NATIONAL INSTITUTES OF HEALTH
National Institute of Neurological Disorders and Stroke

Budget Authority by Activity[1]
(Dollars in Thousands)

	FY 2013 Actual		FY 2014 Enacted [2]		FY 2015 President's Budget		FY 2015 +/- FY 2014	
Extramural Research	**FTE**	**Amount**	**FTE**	**Amount**	**FTE**	**Amount**	**FTE**	**Amount**
Detail								
Channels, Synapses, and Circuits		$132,248		$136,841		$139,234		$2,392
Infrastructure, Training Programs, and Resources		186,162		192,629		195,997		3,367
Neural Environment		198,458		205,353		208,942		3,590
Neurodegeneration		202,688		209,730		213,396		3,666
Neurogenetics		199,730		206,669		210,282		3,613
Repair and Plasticity		121,688		125,916		128,117		2,201
Systems & Cognitive Neuroscience		210,075		217,373		221,173		3,800
Translational Research		70,769		73,228		74,508		1,280
Subtotal, Extramural		**$1,321,818**		**$1,367,740**		**$1,391,649**		**$23,909**
Intramural Research	**334**	**$152,766**	**334**	**$155,919**	**334**	**$157,478**	**0**	**$1,559**
Research Management & Support	**191**	**$57,391**	**191**	**$58,152**	**191**	**$59,334**	**0**	**$1,182**
TOTAL	**525**	**$1,531,975**	**525**	**$1,585,797**	**525**	**$1,608,461**	**0**	**$22,664**

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

[2] The amounts in the FY 2014 column take into account funding reallocations, and therefore may not add to the total budget authority reflected herein.

NATIONAL INSTITUTES OF HEALTH
National Institute of Neurological Disorders and Stroke

Authorizing Legislation

	PHS Act/ Other Citation	U.S. Code Citation	2014 Amount Authorized	FY 2014 Enacted	2015 Amount Authorized	FY 2015 President's Budget
Research and Investigation	Section 301	42§241	Indefinite	$1,585,797,000	Indefinite	$1,608,461,000
National Institute of Neurological Disorders and Stroke	Section 401(a)	42§281	Indefinite		Indefinite	
Total, Budget Authority				$1,585,797,000		$1,608,461,000

NATIONAL INSTITUTES OF HEALTH
National Institute of Neurological Disorders and Stroke

Appropriations History

Fiscal Year	Budget Estimate to Congress	House Allowance	Senate Allowance	Appropriation
2005	$1,545,623,000	$1,545,263,000	$1,569,100,000	$1,539,448,000
Rescission				($12,675,000)
2006	$1,550,260,000	$1,550,260,000	$1,591,924,000	$1,550,260,000
Rescission				($1,503,000)
2007	$1,524,750,000	$1,524,750,000	$1,537,703,000	$1,534,757,000
Rescission				$0
2008	$1,537,019,000	$1,559,106,000	$1,573,268,000	$1,571,353,000
Rescission				($27,452,000)
2009	$1,545,397,000	$1,598,521,000	$1,588,405,000	$1,593,344,000
Rescission				$0
Supplemental				$8,212,000
2010	$1,612,745,000	$1,650,253,000	$1,620,494,000	$1,636,371,000
Rescission				$0
2011	$1,681,333,000		$1,678,696,000	$1,636,371,000
Rescission				($14,368,312)
2012	$1,664,253,000	$1,664,253,000	$1,603,741,000	$1,629,445,000
Rescission				($3,079,651)
2013	$1,624,707,000		$1,629,631,000	$1,626,365,349
Rescission				($3,252,731)
Sequestration				($81,632,357)
2014	$1,642,619,000		$1,631,703,000	$1,587,982,000
Rescission				$0
2015	$1,608,461,000			

Justification of Budget Request

National Institute of Neurological Disorders and Stroke

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

Budget Authority (BA):

	FY 2013 Actual	FY 2014 Enacted	FY 2015 President's Budget	FY 2015 +/- FY 2014
BA	$1,531,974,581	$1,585,797,000	$1,608,461,000	+$22,664,000
FTE	525	525	525	0

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

Director's Overview

The mission of the National Institute of Neurological Disorders and Stroke (NINDS) is to reduce the burden of neurological disorders through research. We support research to understand the brain in health and disease, to develop interventions in the laboratory, and to test diagnostics, prevention strategies, and treatments in people. Neurological disorders cause enormous suffering, disability, and death, and present some of the greatest challenges in all of medicine. However, NIH research has improved the lives of millions of people who confront these diseases, and progress in neuroscience, and science generally, is generating unprecedented opportunities in the coming years. Examples of progress and promise are presented below.

The age adjusted stroke death rate in the United States fell 36.9 percent from 1999 to 2009.[1] This extraordinary progress reflects the cumulative benefit from many epidemiological studies of risk factors and clinical trials of interventions that inform physicians how to tailor stroke prevention interventions for individual patients. This year, for example, a clinical trial provided guidance for managing stroke risk in people with unruptured brain arteriovenous malformations, an abnormality of brain blood vessels, and the Reasons for Geographical and Racial Difference in Stroke (REGARDS) study revealed that regular, moderately vigorous exercise and small improvements in cardiovascular risk factors are linked to reduced risk of stroke in minority populations—improvement from average to optimal on a simple scorecard of seven key risk factors reduced five year risk of a stroke by 25 percent. NINDS is aggressively pursuing opportunities to drive further progress. Major clinical trials are testing a promising treatment for intracerebral hemorrhage, prevention of stroke following a transient ischemic attack (or mini-stroke), and the long-term effectiveness of surgical vs. medical treatments for people with narrowing of arteries to the brain, among other issues. A new Stroke Trials Network will allow

[1] *Circulation 134:e6-245, 2013*

NINDS to determine more quickly and at less cost what treatment, prevention, and rehabilitation strategies work best. The network builds on transformative improvements in effectiveness and efficiency from NeuroNEXT, an NINDS network for clinical studies and early phase trials of new treatments, including those for rare diseases. Because racial and ethnic disparities in stroke persist despite overall progress, a November 2013 NINDS workshop focused on evidence from epidemiological studies that will guide a shift in the Institute's emphasis from understanding disparities to developing interventions that eliminate them. In addition to stroke itself, NINDS-led planning for stroke and for Alzheimer's Disease-Related Dementias both stressed the importance of research to reduce cognitive impairment from brain vascular disease, which frequently co-exists with Alzheimer's disease.

Traumatic Brain Injury (TBI) is the leading cause of death and disability in children and young adults, common among the elderly, and a major concern for the military and veterans. More than 30 major, multi-site clinical trials of interventions for TBI have failed to improve outcomes. These failures reflect variations in care among medical centers and inadequate recognition that subtypes of TBI may respond differently to interventions, which can obscure the benefit of treatments being tested. To address these shortcomings, NINDS developed the International TBI Research Initiative. This prospective, observational, multi-center study of 5,000 adults and children with TBI in the United States is coordinated with large studies by the European Union and the Canadian Institute of Health Research. Complementing these studies, an observational study of 1,000 children is evaluating the effectiveness of six major critical care guidelines for severe, pediatric TBI that lack compelling evidence. These studies will inform TBI classification and care guidelines, and enhance prospects for future clinical trials. NINDS laid the essential foundation for this "big data" strategy by working with the research community through the NINDS Common Data Elements program to facilitate meaningful comparison across studies, and via the Department of Defense and NIH-led Federal Interagency TBI Informatics System (FITBIR), which provides a database for sharing information among qualified investigators.

Basic research is the foundation for progress against disease. Therapies now in preclinical or clinical testing through NIH programs and the private sector for fragile X syndrome, multiple sclerosis, muscular dystrophy, Parkinson's disease, spinal muscular atrophy, and many other diseases would not be possible without fundamental research to understand the normal brain and its diseases. The President's multi-agency Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative will provide scientists with dramatically better tools to understand essential, and heretofore unapproachable, questions about how networks, or circuits, of brain cells enable us to perceive, think, and act. As for basic research generally, there are excellent reasons for our confidence that this Initiative will ultimately advance progress against disease. Some diseases, like autism and epilepsy, are fundamentally disorders of brain circuitry, and others, such as stroke, Parkinson's and Alzheimer's disease, disrupt brain circuits as nerve cells die. Even with our limited understanding of brain circuits and imprecise technologies for altering brain cell activity, interventions that compensate for malfunctioning brain circuits already produce remarkable results. Deep brain stimulation reverses symptoms for many people with Parkinson's disease and dystonia, and shows promise for epilepsy, Tourette syndrome, and several other disorders. Cochlear implants send coded auditory signals that brain circuits can interpret to restore useful hearing to thousands of people, and in laboratory studies, paralyzed people have controlled a robotic arm by signals directly monitored from their brains' movement

control circuits. Better understanding of brain circuits and tools to influence their activity would greatly improve these interventions and perhaps reveal entirely unforeseen therapeutic strategies.

Innovation is essential to progress. The remarkable productivity of today's neuroscience is evident in prestigious awards, including Nobel and Lasker Awards, and success in intensely competitive trans-NIH innovation-focused programs, including Pioneer Awards and NIH Director's Transformative Research Awards. These grants are exploring such fundamental questions as how experience remodels nerve cells' shape, how the brain controls the distribution of blood flow in the cerebral cortex according to its changing needs, and whether the superior cognitive abilities of humans are due to evolutionary advances in glial (supporting) cells' control of the formation and function of synapses. Other investigators in these programs are developing new methods to generate neural cells for regenerative medicine, microdevices for non-invasive monitoring of brain electrical activity, direct brain control of prosthetic arms and hands with sensory feedback, strategies for chronic pain that leverage molecules that normally resolve acute pain, and a method to fix the type of gene mutations that cause Rett Syndrome and other disorders. NINDS continues to foster innovation, stressing investigator initiated research, and encouraging new investigators throughout its programs. The future of neuroscience depends on recruiting, training, and nurturing smart, imaginative, and diverse new investigators and on providing an environment in which new and established investigators can engage their insight and imagination to take on the challenges of studying the brain and its diseases.

Overall Budget Policy:
The FY 2015 President's Budget request is $1,608,461 million, an increase of $22.664 million or 1.4 percent, over the FY 2014 Enacted level. NINDS emphasizes investigator-initiated research throughout its programs, but solicits research proposals to address mission-critical scientific opportunities and public health needs that are not met through investigator-initiated programs. In recent years, the Institute has raised funding success rates, actively encouraged new investigators, and launched several new targeted programs. To accomplish this within the level of resources available, NINDS rigorously evaluates programs, in consultation with the National Advisory Neurological Disorders and Stroke Advisory Council and outside experts, and closes legacy projects that no longer warrant investment, because goals have been met, science has advanced, or programs have not proven effective. Clinical trials are inherently expensive, but scheduled interim analyses of progress have allowed the Institute to terminate 15 large clinical trials early since 2009 because the clinical question had been answered. Similarly, NINDS monitors milestones in preclinical therapy development projects, shifting funds to the best current opportunities. NINDS evaluates the mission relevance of all requests to submit applications for large investigator-initiated projects and sunsets multi-investigator program project grants after one renewal period. Across all programs, NINDS has enhanced attention to transparency in reporting of research and to rigor and reproducibility, especially for studies that justify major investments in preclinical therapy development or clinical trials. NINDS leadership on this issue has led to significant changes within NIH, scientific journals, and the scientific community. In FY 2014, NIH will invest a total of $40 million to launch its part of the BRAIN Initiative, but this ambitious effort will need a substantial ramp up in FY 2015 to ensure the Initiative's success. NIH is requesting a total of $100 million in FY 2015 to advance the high priority research areas of the BRAIN Initiative, as outlined in its interim strategic plan. As one

of the leaders of the BRAIN Initiative at NIH, NINDS is requesting an increase of $25.15 million in its budget to support these research priorities.

Program Descriptions and Accomplishments

Channels, Synapses, and Neural Circuits: Ion channels, synapses, and circuits of nerve cells are fundamental components of the nervous system. Ion channels control electrical currents in cells. Synapses are the connections by which nerve cells influence the activity of other nerve cells. Circuits formed by networks of interconnected nerve cells carry out the information processing that enables us to perceive, think, and act. Basic research has made remarkable discoveries at the molecular level about how channels and synapses function in health and disease. Both this year and last year, Nobel Prizes recognized the importance of research supported by NIH, including NINDS, on molecules that enable cells to precisely deliver and respond to chemical signals at synapses. Until recently, technology has limited the ability of researchers to study the structure and activity of the large numbers of nerve cells that make up functional brain circuits, but several new methods , which lay the groundwork for the President's Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative, are truly transforming research on brain circuits. One of the new methods is optogenetics, which allows investigators to control the electrical activity of specific subsets of genetically modified brain cells with light pulses. Optogenetics has, for example, demonstrated a key role for adult brain stem cells in laying down new memories and clarified how the balance of movement control circuits goes awry in Parkinson's disease. The major goals of the Channels, Synapses, and Circuits Program are to advance basic understanding of channels, synapses, and circuits; to foster research that has immediate medical relevance; and to develop therapies based on the discoveries from this basic research. Diseases of focus include the channelopathies, which are diseases that arise directly from defects in channels, and the many types of epilepsy, which result from perturbations of channels, synapses, and circuits that cause abnormal excitability of the brain. Since 2001, the Epilepsy Benchmarks process has brought NINDS, the research community, and non-governmental organizations together to establish milestones and monitor progress toward the goal of "no seizures, no side effects." The April 2013 conference *Curing the Epilepsies 2013: Pathways Forward* assessed progress on the Epilepsy Benchmarks and set goals for the future.

Budget Policy:
The FY 2015 President's Budget request is 139.234 million, an increase of $2.392 million or 1.7 percent, over the FY 2014 Enacted level. In 2015, NINDS will continue to balance investigator-initiated research and research targeted to specific mission priorities, including projects funded through the Institute's translational research and clinical trials programs. In December 2013 NIH issued the first six funding opportunities for the President's BRAIN Initiative, which is directly relevant to the Channels, Synapses, and Circuits Program and has implications for many NINDS programs. In April 2013, a major conference on *Curing the Epilepsies 2013: Pathways Forward* continued the Epilepsy Benchmarks process, which for more than a decade has brought the NIH, the research community, and patient advocates together to establish research priorities and monitor progress. The 2014 NINDS Benchmarks for Epilepsy Research will focus research by the NINDS and the epilepsy community going forward. The Epilepsy Centers without Walls program brings together the best multidisciplinary team of investigators, regardless of

geographic locations, to focus for multiple years on a specific Benchmarks priority that is not easily addressed through regular grant mechanisms. A continuing Center focused on genetics and genomics is making encouraging progress, and the Institute is soliciting applications for a Center focused on SUDEP (Sudden Unexplained Death in Epilepsy) in 2014. NINDS and NHLBI are also collaborating to expand the CDC's Sudden Unexpected Infant Death (SUID) Case Registry to include SUDEP and Sudden Cardiac Death in individuals up to age 24 in 15 states.

Portrait of a Program: Driving progress against epilepsy through genetics

FY 2014 Level: $5.0 million
FY 2015 Level: $5.0 million
Change: +$0.0 million

New genetics technologies offer remarkable opportunities to accelerate the pace of discovery in epilepsy. A recent report from the Epi4K Project, which NINDS supports as an Epilepsy Center without Walls, demonstrated the potential of these new methods with the discovery of two new genes for infantile spasms and Lennox-Gastaut Syndrome, which are severe types of childhood epilepsy, and promising evidence of several other epilepsy related genes .[1] The Epi4K investigators are using next generation sequencing to search for mutations in the genes of a cohort of more than 4,000 well characterized patients (thus "4K"), which was created in the NINDS Epilepsy Phenome/Genome Project. In addition, they developed and tested highly effective analytical methods to find and confirm disease-causing mutations in the massive data generated by new sequencing methods. The combination of thoroughly characterized patient cohorts, advanced sequencing technology, and powerful analytical methods dramatically improves the prospects for identifying disease genes, which in turn drives research to understand disease mechanisms and rational strategies to develop therapies that target underlying causes of epilepsy.

NINDS will extend epilepsy genetics research in two complementary ways. First, NINDS, in collaboration with Citizens United for Research in Epilepsy (CURE), will create a central data repository to take advantage of the data generated as new sequencing technology fundamentally changes how clinicians screen for potential genetic disorders. The database will include clinical information paired with gene sequences obtained through clinical genetic testing of pediatric patients who have epilepsies that cannot be attributed to or other causes, such as brain tumors or traumatic injury. The database will provide researchers with a valuable resource to find epilepsy gene mutations, and return to clinicians and their patients information about newly identified gene variants. Second, NINDS will support research that builds on gene findings to determine how the identified gene mutations cause epilepsy, which in turn will lead to the development and testing of potential therapeutic targets. These studies will, for example, derive induced pluripotent stem cells from patients with specific mutations and precisely engineer mice that model subtypes of epilepsy. Importantly, the recent gene discoveries strongly reinforce accumulating evidence that epilepsy shares common biological mechanisms with other diseases, including fragile X syndrome and autism. Therefore progress against even rare epilepsy mutations may spur progress against not only other epilepsy syndromes but also neurodevelopmental diseases in general.

1. *Nature 501:217-21, 2013*

Infrastructure, training programs, and resources: To enhance the effectiveness of all NINDS extramural programs, the Institute supports common infrastructure and programs related to clinical research and clinical trials, training and career development, workforce diversity, and health disparities. The Office of Clinical Research (OCR) is the focal point for large clinical trials and epidemiological studies at NINDS, and OCR works closely with all disease programs in the Institute. OCR has significantly increased the efficiency and effectiveness of clinical trials, which are inherently expensive, by closely monitoring progress with milestones, providing resources to improve patient access and recruitment, and developing multi-site clinical networks that provide common resources and economies of scale. For example, enhanced monitoring and

interim analyses enabled OCR to stop 15 major clinical trials early between 2009 and 2013, usually because the trial's conclusion was already evident. The Network for Excellence in Neuroscience Clinical Trials (NeuroNEXT), established in 2012, carries out clinical studies and early phase clinical trials of novel therapies for neurological disorders. Network efficiencies include a single Institutional Review Board and master agreements among clinical sites that substantially reduce the time and cost required to launch new trials. A new Stroke Clinical Trials Network, which applies organizational and administrative efficiencies from NeuroNEXT, will conduct clinical trials for prevention, treatment, and rehabilitation of stroke more quickly and for less cost. The OCR Common Data Elements (CDE) program works with the research and patient advocacy communities to facilitate comparison and sharing of clinical data across studies, enhancing the value of these major clinical investments. The CDE program has developed general elements useful for all neurological diseases and specific CDEs for amyotrophic lateral sclerosis (ALS), Duchenne/Becker's muscular dystrophy, epilepsy, Friedreich's ataxia, headache, Huntington's disease, multiple sclerosis, myasthenia gravis, neuromuscular disease (general), Parkinson's disease, spinal cord injury, spinal muscular atrophy (SMA), stroke, and traumatic brain injury (including pediatric specific aspects). Following the advice of strategic planning panels on health disparities and on workforce diversity, the Institute has integrated health disparities research within OCR. Similarly, activities to enhance diversity of the scientific workforce are now integrated with all NINDS training programs through the renamed Office of Training, Career Development, and Workforce Diversity. Nothing is more essential to progress against neurological disorders than recruiting, training, and encouraging early career development of talented new investigators. The Office supports a spectrum of programs targeting the training needs of students, postdoctoral fellows, clinician-scientists, and early career faculty, providing grant awards, mentoring and networking through local and national workshops, and direct consultation with applicants and awardees.

Budget Policy:
The FY 2015 President's Budget request is $195.997 million, an increase of $3.367 million or 1.7 percent, over the FY 2014 Enacted level. The NeuroNEXT clinical network, which includes a data coordinating center, a clinical coordinating center, and 25 clinical sites across the U.S., is organized and clinical studies, including clinical trials, are underway. In 2015, NINDS will continue to solicit proposals for NeuroNEXT pediatric and adult clinical studies from academic investigators, foundations, small businesses, and industry. NINDS stroke clinical trials have contributed substantially to improvements in public health. The new Stroke Trials Network will enhance the effectiveness of stroke clinical trial by eliminating the costs and time associated with developing the infrastructure for each major trial anew and incorporating other efficiencies, such as central Institutional Review Boards and master contract agreements. The Network is establishing Regional Coordinating Centers, National Clinical Coordinating Center, and National Data Management Center in FY2014 and will begin clinical activities by enhancing ongoing NINDS multi-center stroke trials. The Neurological Emergency Treatment Trials Network, which brings together appropriate expertise and clinical sites to conduct trials for neurological emergencies, will similarly incorporate lessons from the NeuroNEXT with the network's renewal in 2015. NINDS is also continuing its support for phase III investigator-initiated clinical trials across all neurological disorders. The CDE program continues to work with investigators to integrate CDEs into data platforms, communicate the value of these data standards, and train and support their use, as well as to improve the quality of CDEs with updates in response to

scientific progress. The CDE program is developing CDEs for additional diseases, including mitochondrial disorders, and myotonic, facioscapulohumeral (FSHD), and congenital muscular dystrophies. A full range of NINDS programs in training and career development are also continuing, including individual and institutional grants at the graduate, post-doctoral, and career development levels, and an intensive training course in clinical trials methods for fellows and faculty in the clinical neurosciences. Many of the programs target special needs, such as promoting diversity and enabling neurosurgeons to accommodate research preparation into their demanding training requirements.

Portrait of a Program: Interventions to Eliminate Stroke Disparities

FY 2014 Level: $7.0 million
FY 2015 Level: $7.0 million
Change: +$0.0 million

Reducing disparities in stroke among racial and ethnic groups is a high priority for NINDS, and the Institute is enhancing programs to address this issue for FY 2015. A study from Corpus Christi, Texas this year illustrates the promise and the challenges. The study reported a dramatic 35.9 percent reduction from 2000 to 2010 in the rate of ischemic stroke, the most common type of stroke, which is caused by blocked blood flow to the brain. However, although strokes declined in both Mexican Americans and non-Hispanic whites, the disparity in stroke rates between these groups persisted. Studies in other racial and ethnic groups have also found that stroke disparities persist despite the overall encouraging progress against stroke.

Over many years, large-scale, NINDS-funded epidemiologic studies including *Brain Attack Surveillance In Corpus Christi (BASIC), Reasons for Geographic And Racial Differences in Stroke (REGARDS), Northern Manhattan Stroke Study (NOMAS), and Greater Cincinnati/Northern Kentucky Stroke Study (GCNKSS)* have revealed the extent of stroke disparities and identified risk factors that contribute to stroke rates. With guidance from the NINDS Advisory Panel on Health Disparities, in FY 2013 NINDS funded four Stroke Prevention/Intervention Research Program (SPIRP) centers that are developing high impact, culturally tailored interventions to lower stroke risk among racial and ethnic minorities in the United States. In FY 2014, NINDS convened the *Interventions Designed to Eliminate and Solve Stroke Disparities (IDEAS)* workshop to analyze the implications of the epidemiological studies, identify research gaps, share knowledge about past interventions, and assess possible future interventions to reduce stroke risk. The IDEAS workshop and NINDS health disparities planning will guide NINDS as the Institute shifts its emphasis from identifying risk factors that contribute to disparities to applying this knowledge to develop and test interventions to reduce these disparities.

[1] *Circulation 134:e6-245, 2013; Annals of Neurology July 2013 epub 10.1002/ana.23972*

Neural Environment: Non-nerve cells, called glial cells, outnumber nerve cells in the brain. Glial cells, together with specialized blood vessels and immune cells in the brain, maintain the local environment around nerve cells, fight infections, and control which molecules enter brain tissue from the circulating blood. Over the last several years, there has been increasing recognition that glial cells are not merely passive housekeepers, but actively shape brain development and synapse function. The Neural Environment Program supports basic, translational, and clinical research on the normal neural environment and on diseases in which its disruption plays a major role. Neurological disorders can result when non-neuronal cells are compromised; when these cells become aggressors in inflammatory or autoimmune disorders; when cells become cancerous and form tumors; when viruses, bacteria, or parasites infect the nervous system; or when the blood supply to brain cells is compromised. Specific diseases include stroke, multiple sclerosis, central and peripheral nervous system tumors, neuro-AIDS, prion diseases, and central nervous system infections. Basic science research includes glial cell

biology, neuroimmunology, neurovirology, brain blood vessel biology, and the blood brain barrier. Basic research this year, for example, demonstrated that during sleep glial cell-controlled conduits for cerebral spinal fluid flow between brain cells open widely, allowing the brain to flush out toxins that build up during waking hours. These results may have implications for multiple neurodegenerative disorders, such as Alzheimer's and Parkinson's disease, in which toxic proteins build up in the brain. The neural environment program promotes the translation of basic scientific knowledge into useful diagnostic tools, preventive measures, and targeted therapies for neurological disorders.

Budget Policy:
The FY 2015 President's Budget request is $208.942 million, an increase of $3.59 million, or 1.7 percent, over the FY 2014 Enacted level. NINDS will continue to balance investigator-initiated research and research targeted to specific priorities, including research through the Institute's translational research and clinical trials programs. An extensive and inclusive stroke planning process, which reported to the NANDS Council in September 2012, identified the top scientific research priorities in stroke prevention, treatment, and recovery research that will guide NINDS activities in stroke.

Neurodegeneration: The Neurodegeneration program focuses on adult onset neurodegenerative diseases, that is, diseases in which brain cells progressively die. Alzheimer's disease, ALS, frontotemporal dementias (FTD), Huntington's disease, Parkinson's disease, and vascular cognitive impairment are among the neurodegenerative diseases that affect adults. These disorders present an increasing human and economic challenge to the United States as our population ages. The program broadly supports research to understand these diseases and to translate basic findings into clinical practice. Shared mechanisms that contribute to multiple neurodegenerative disorders present a major opportunity for progress against multiple disorders. Recent research revealed, for example, that proteins that form abnormal aggregates in Parkinson's disease move from one brain cell to another, opening the possibility that stopping cell to cell to cell propagation may halt the progress of Parkinson's and several other neurodegenerative diseases in which protein aggregation is a key step in the underlying disease mechanism. Research on genes that can cause neurodegenerative diseases has been a major driver of progress for both inherited and non-inherited neurodegenerative diseases, because biological pathways revealed by gene identification are often affected in non-inherited diseases as well. As an example of how gene findings spur further research, two years ago researchers found the most common genetic cause yet identified for ALS and FTD. Already follow up studies have uncovered the mechanisms by which mutations in this gene damage cells, generated cultured neurons derived from skin cells of patients, and found drugs that block the damaging effect of the gene mutations in these human neurons in cell culture. The development of biomarkers and diagnostics and preclinical development and clinical testing of drug, biologic, genetic, and brain stimulation therapies are also priorities for the Neurodegeneration Program.

Budget Policy:
The FY 2015 President's Budget request is $213.396 million, an increase of $3.666 million or 1.7%, over the FY 2014 Enacted level. NINDS neurodegeneration research will continue to balance investigator-initiated research and solicited research, including therapy development funded through the Institute's translational research and clinical trials programs. Major

continuing programs include the Morris K. Udall Parkinson's Disease Centers of Excellence program and the Parkinson's Disease Biomarkers Program, which is developing and validating objectively measureable indicators of the disease process and drug actions that can accelerate the development of treatments. In January 2014, NINDS engaged the scientific community and the public in identifying basic, translational, and clinical priorities for future Parkinson's disease research, in keeping with the Institute's commitment to periodic strategic planning for Parkinson's disease. In 2013, NINDS led a scientific conference on Alzheimer's Disease Related Dementias and development of recommendations, with public input. These recommendations are now an integral component of the National Alzheimer's Project Act (NAPA) plan that is guiding further research in this area. NINDS is developing implementation plans to take advantage of the separate and overlapping research opportunities identified by these conferences.

Neurogenetics: Gene defects cause hundreds of rare diseases that affect the nervous system, including ataxias, Down syndrome, dystonias, fragile X syndrome, lysosomal storage diseases, muscular dystrophies, peripheral neuropathies, Rett syndrome, spinal muscular atrophy, Tourette syndrome, and tuberous sclerosis, among many others. Gene variations also influence susceptibility to and recovery from Alzheimer's, Parkinson's, multiple sclerosis, stroke, and other common neurological disorders. The Neurogenetics program supports research to identify genes that cause or influence neurological disorders, to elucidate the molecular mechanisms through which these genes act, and to develop genetic animal and cell models of human disease. Preclinical development and clinical testing of treatments for neurogenetic disorders are also important priorities for this program. Over the last two decades, the identification of hundreds of genes related to neurological disorders has led to diagnostics that enable physicians to identify a disease months or even years more quickly than before. Gene findings also enable researchers to develop animal models of key aspects of disease, provide insights about underlying mechanisms of disease, and yield rational strategies for targeting those mechanisms with therapies. This year, for example, a team of investigators identified a specific gene mutation that causes pontocerebellar hypoplasia, a rare disorder of abnormal brain development. Investigators then determined that the mutation disrupts a specific step in cells' energy metabolism, and studies are now testing a nutritional supplement to circumvent the cell defect in genetic mouse models of the disease and in cultured human cells. In another recent study, researchers built upon prior discovery of a gene mutation that causes the rare neurodevelopmental disorder PMSE (polyhydramnios, megalencephaly, and symptomatic epilepsy syndrome) to identify a key pathway in the disease mechanism, then showed that a drug approved for other diseases could block the disease mechanism in a mouse model of PMSE, and conducted preliminary clinical studies in five human patients that have yielded encouraging results. Basic genetics research to understand normal nervous system development and function is also a key aspect of the neurogenetics program. Studies this year, for example, showed how the developing cerebral cortex acquires areas specialized for particular functions. To support sharing of data and research tools across all these activities, the Neurogenetics Program develops and supports resources such as tissue and information registries, atlases of gene expression and function, and mutagenesis and phenotyping methodologies.

Budget Policy:
The FY 2015 President's Budget request is $210.282 million, an increase of $3.613 million or 1.7 percent, over the FY 2014 Enacted level. NINDS will continue to support investigator-initiated grants and targeted activities in neurogenetics, including projects funded through the Institute's translational research and clinical trials programs. The Institute is providing substantial support for the application of whole genome sequencing and other "next generation" genomics methods to neurological disorders. Major continuing trans-NIH programs include the Paul D. Wellstone Muscular Dystrophy Cooperative Research Centers, which have a strong translational research component, and the Autism Centers for Excellence. The Institute also works closely with the NIH Office of Rare Disease Research in supporting and providing disease specific expertise to nervous system disease related consortia within the Rare Diseases Clinical Research Network. NINDS-supported resources for neurogenetics research that enhance the efficiency and effectiveness of research include the NINDS Human Genetics Repository, which fosters sharing of clinically well characterized genetic material and cell lines among investigators.

Repair and Plasticity: The Repair and Plasticity Program leads NINDS research on traumatic brain injury (TBI), spinal cord injury, and peripheral nerve injury. The program also supports fundamental studies of neural plasticity—the ability of the brain and nervous system to change—and the implications of plasticity for recovery following injury or disease. Research on injury covers the full spectrum from understanding the mechanisms of immediate damage and the cascade of delayed damage that continues in the hours after initial injury, through development of interventions in animal models, and clinical testing of treatments to minimize or repair damage. Diagnostics and biomarkers are also a high priority, especially because of concerns that mild TBI from sports concussions or blast injury can lead to cognitive deficits or predispose to problems in later life. Neural stem cells present an important aspect of plasticity research, and the program supports research on the normal roles of stem cells in the brain and their potential use for testing therapeutics and cell replacement. The Neural Interfaces Program supports the development of devices that interface with the nervous system to treat disease or restore lost functions. NINDS pioneered this area of research more than 30 years ago, including major contributions to the development of cochlear implants, whose importance was recognized this year with a Lasker Award. More recently the Neural Interfaces Program has supported groundbreaking research that enables paralyzed persons to control a robotic arm and hand via signals detected directly from their brains, and research to improve deep brain stimulation technology, which has proven effective for Parkinson's disease and dystonia and shown promise for several other disorders.

Budget Policy:
The FY 2015 President's Budget request is $128.117 million, an increase of $2.201 million or 1.7 percent, over the FY 2014 Enacted level. NINDS continues to balance investigator-initiated research and solicitations, including projects funded through the Institute's translational research and clinical trials programs. In FY 2014, NINDS launched the International TBI Research Initiative, a prospective, observational, multi-center study of 3,000 adults and children with TBI in the United States that is coordinated with large studies by the European Union and the Canadian Institute of Health Research. Complementing these studies, an observational study of 1,000 children is evaluating the effectiveness of six major critical care guidelines for severe,

pediatric TBI that lack compelling evidence. These studies, which will provide guidance for improving patient care and for conducting future clinical trials, use the TBI Common Data Elements, developed with the international research community, and the NIH-Department of Defense led Federal Interagency TBI Informatics System (FITBIR) database to encourage sharing of data. NINDS is also supporting the addition of legacy data from prior studies to the FITBIR database. NINDS is working closely with the Foundation for NIH (fNIH) on TBI related research through the fNIH Sports and Heath Research Program. The fNIH created this program with a major donation from the National Football League, but the research has public health relevance far beyond professional football. Following the guidance from two major scientific conferences on Chronic Traumatic Encephalopathy (CTE) and other delayed effects of TBI, NINDS issued solicitations and two major, multi-investigator collaborative projects are now underway to define the scope of long-term changes that occur in the brain years after a head injury or after multiple concussions. The program is funding pilot studies on improving the diagnosis of concussion and identifying potential biomarkers that can be used to recovery, especially in pediatric populations. NINDS will issue another solicitation on longitudinal studies for 2015. In 2015, the Neural Interfaces Program will continue to solicit and support projects to translate advanced neural prosthetics and other devices up to and through "first in human" clinical demonstrations, coordinated with therapy development programs led by the Office of Translational Research.

Systems and Cognitive Neuroscience: Systems of interconnected nerve circuits in the brain, spinal cord, and body control learning, memory, attention, language, thinking, emotion, sensation, movement, and response to pain, as well as sleep, feeding, and drinking. The Systems and Cognitive Neuroscience Program supports research on how the brain carries out these complex functions, on counteracting the disruptive effects of neurological disorders, and on promoting recovery. Research methods include non-invasive imaging of brain structure and function, including monitoring of brain activity associated with specific cognitive and behavioral processes. Chronic pain disorders, including migraine and other headaches, are among the most prevalent of all medical conditions and are a high priority for this program. Understanding why acute pain from an injury can lead to persistent, chronic pain in some people is an important area of pain research. Recent research, for example, revealed that brain imaging may predict whether a person who has acute back pain will go on to develop chronic back pain. The results support the growing evidence that the brain plays a critical role in the transition from acute to chronic pain, a concept that may lead to changes in the way doctors treat patients. NINDS leads NIH pain research, which is coordinated through the NIH Office of Pain Policy and the NIH Pain Consortium. NIH and NINDS also lead the Interagency Pain Research Coordinating Committee (IPRCC), which coordinates the wider Federal and private sector communities.

Budget Policy:
The FY 2015 President's Budget request is $221.173 million, an increase of $3.8 million or 1.7 percent, over the FY 2014 Enacted level. NINDS balances investigator initiated research and solicitations, including projects funded through the Institute's translational research and clinical trials programs. Pain continues to be a major area of emphasis, with NINDS leading coordination of NIH activities through the NIH Pain Consortium. Working through the Interagency Pain Research Coordinating Committee, a Federal Pain Research Portfolio Analysis Report and database will be completed in early FY2014 and a National Pain Strategy Task Force

will release a report later in the year. NINDS also supports the NIH Pain Consortium Centers of Excellence for Pain Education, which act as hubs for the development, evaluation, and distribution of pain management curriculum resources for medical, dental, nursing and pharmacy schools to enhance and improve how health care professionals are taught about pain and its treatment. A Consortium initiative on the neurobiology of migraine will be renewed in FY2014 and continue in FY 2015.

Translational Research: The Office of Translational Research (OTR) facilitates the preclinical development of new therapeutic interventions for neurological disorders and, working with the Office of Clinical Research, supports first-in-human studies. OTR manages NINDS translational activities that span the Institute's extramural programs, providing therapy development expertise that complements disease-specific expertise across the Institute. The largest OTR program, the Cooperative Program in Translational Research, supports teams of academic and small business investigators to develop therapies for any neurological disorder. The failure rate is high in therapy development, and therefore milestone-based funding allows OTR to stop projects in this program that are no longer making progress and to shift funds to more promising opportunities. A gene therapy for advanced Parkinson's disease are among the interventions from this program that are now in NINDS clinical trials, and agents for spinal muscular atrophy and muscular dystrophy are among those showing promise in preclinical studies. OTR's longstanding Anticonvulsant Screening Program (ASP) has contributed to the development of ten drugs now on the market for epilepsy. Following the guidance of an external review, the ASP has incorporated new animal models to identify agents for treatment-resistant epilepsy and for disease prevention and modification, including an animal model of mesial temporal lobe epilepsy. ASP is also implementing screening tests for identifying compounds with improved side effect profiles, including minimal effects on cognitive function. The OTR-led NIH Blueprint for Neuroscience Grand Challenge on Neurotherapeutics supports innovative drug development by providing investigators access to expert consultants and laboratory resources that have been traditionally available to large pharmaceutical companies. The program is on track to meet its first five year goal of advancing a product to the clinic, with preclinical development of drugs for fragile X syndrome, familial dysautonomia, narcolepsy, and other disorders meeting milestones to move on through the development pipeline, and other projects showing sufficient promise that they have obtained private sector investment for further development. OTR also leads the NINDS SBIR and STTR programs, working with scientific experts throughout the extramural program. One recent example of how investments in this program can make a substantial difference in peoples' lives is a smart spoon, now on the market, that actively cancels out hand tremors, thereby enabling patients with essential tremor and other neurological disorders to feed themselves. NINDS continues an active working group with the FDA Center for Biologics Research to discuss shared interests on advancing cell, gene therapy, and other biologic therapies for neurological disorders.

Budget Policy:
The FY 2015 President's Budget request is $74.508 million, an increase of $1.28 million or 1.7 percent, over the FY 2014 Enacted level. This includes programs led by the Office of Translational Research, but does not include all NINDS translation research activities, which are also supported through budgets of other program areas as appropriate to the disease of focus. Following the successful recruitment of additional expertise in drug development, OTR has

significantly redesigned its milestone driven program in preclinical therapy development to enhance the program's effectiveness. The program will enhance use of staged funding, central contract resources, and expert consultants, and better accommodate the different requirements for development of devices, small molecule drugs, and biologics. The Anticonvulsant Screening Program (ASP), including new leadership, is also continuing with enhancements in place, as described above, in response to recommendations from an external review. As the NIH Neuroscience Blueprint Neurotherapeutics Network continues, the Blueprint Institutes and Centers will continue to support the infrastructure for this program collectively and each Institute will support specific drug development projects as appropriate to its mission. NINDS also continues to support SBIR/STTR grants through general and targeted solicitations related to the Institute's mission. OTR will also launch a new contract program to allow NINDS to generate the critical experimental data to increase the likelihood of success of therapy development and clinical trials. This complements the Institute's ongoing activities to enhance the rigor, reproducibility, and robustness of research and the transparency of reporting.

Intramural Research: The NINDS Intramural Research Program conducts basic, translational, and clinical research on the NIH campus in Bethesda, Maryland. The Intramural Program fosters close interactions across the NIH, which is home to one of the largest communities of neuroscientists in the world, including over 200 laboratories in 11 different institutes. Among the unique resources of the NIH campus, the Mark O. Hatfield Clinical Center is a hospital totally dedicated to clinical research and the NIH Porter Neuroscience Research Center integrates neuroscience across institutes and disciplinary boundaries. NINDS Intramural research on the normal nervous system covers a broad range of neuroscience, including the structure and function of ion channels, synapses and circuits, neuronal development, and integrative neuroscience. Recent research from the Intramural Research Program, for example, developed methods for acquiring far more detailed brain images with magnetic resonance imaging (MRI), described how the molecular structure of ion channels determines their function, and revealed how mutations cause hereditary spastic paraplegias, a type of movement disorder, by altering important cell structure that guides synthesis, distribution, and quality control of cells' proteins. Intramural laboratories conduct research and therapy development for many neurological disorders, including neurogenetic diseases, infectious diseases such as HIV, movement disorders, multiple sclerosis, stroke, and brain tumors. The Center for Neuroscience and Regenerative Medicine, which is a collaborative program between the NIH Intramural program and the Department of Defense, including the Walter Reed National Military Medical Center and the Uniformed Services University, brings together clinicians and scientists across disciplines to catalyze innovative approaches to traumatic brain injury research.

Budget Policy:
The FY 2015 President's Budget request is $157.478 million, an increase of $1.559 million or 1 percent, over the FY 2014 Enacted level. In March 2014, NIH will formally dedicate the second phase of the Porter Neuroscience Center. The facility is designed to enhance interdisciplinary interactions among neuroscience investigators from eight NIH Institutes, including NINDS. NINDS continues to build on its existing strengths in basic laboratory science, which include structural and cell biology, synaptic function, and circuit reconstruction. Patient based research continues to emphasize key areas of strength that include neurogenetics,

neuroimmuniology-neurovirology, neuroimaging, stroke, movement disorders, and surgical neurology. NINDS also continues to foster interaction between laboratory and clinical research.

Research Management and Support (RMS): NINDS 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.

Budget Policy:
The FY 2015 President’s Budget request is $59.334 million, an increase of $1.182 million or 2.0 percent over the FY 2014 Enacted level. The increase supports the 1% pay raise for federal employees and activities related to the interagency pain research coordinating committee.

NATIONAL INSTITUTES OF HEALTH
National Institute of Neurological Disorders and Stroke

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

		FY 2014 Enacted	FY 2015 President's Budget	FY 2015 +/- FY 2014
Total compensable workyears:				
	Full-time employment	525	525	0
	Full-time equivalent of overtime and holiday hours	0	0	0
	Average ES salary	$180	$180	$0
	Average GM/GS grade	12.0	12.0	0.0
	Average GM/GS salary	$98	$98	$0
	Average salary, grade established by act of July 1, 1944 (42 U.S.C. 207)	$103	$110	$0
	Average salary of ungraded positions	$103	$110	$0
	OBJECT CLASSES	**FY 2014 Enacted**	**FY 2015 President's Budget**	**FY 2015 +/- FY 2014**
	Personnel Compensation			
11.1	Full-Time Permanent	$29,038	$29,329	$290
11.3	Other Than Full-Time Permanent	22,856	23,085	229
11.5	Other Personnel Compensation	769	777	8
11.7	Military Personnel	535	541	5
11.8	Special Personnel Services Payments	7,807	7,885	78
11.9	**Subtotal Personnel Compensation**	**$61,006**	**$61,616**	**$610**
12.1	Civilian Personnel Benefits	$16,745	$17,332	$586
12.2	Military Personnel Benefits	381	385	4
13.0	Benefits to Former Personnel	0	0	0
	Subtotal Pay Costs	**$78,133**	**$79,333**	**$1,200**
21.0	Travel & Transportation of Persons	$3,721	$3,784	$63
22.0	Transportation of Things	274	279	5
23.1	Rental Payments to GSA	1	1	0
23.2	Rental Payments to Others	97	98	2
23.3	Communications, Utilities & Misc. Charges	685	697	12
24.0	Printing & Reproduction	2	2	0
25.1	Consulting Services	$2,758	$2,805	$47
25.2	Other Services	16,940	17,220	280
25.3	Purchase of goods and services from government accounts	140,929	138,161	-2,769
25.4	Operation & Maintenance of Facilities	$1,380	$1,403	$23
25.5	R&D Contracts	14,196	22,486	8,289
25.6	Medical Care	298	310	11
25.7	Operation & Maintenance of Equipment	13,896	14,132	236
25.8	Subsistence & Support of Persons	0	0	0
25.0	**Subtotal Other Contractual Services**	**$190,397**	**$196,515**	**$6,118**
26.0	Supplies & Materials	$9,151	$9,307	$156
31.0	Equipment	8,527	8,672	145
32.0	Land and Structures	0	0	0
33.0	Investments & Loans	0	0	0
41.0	Grants, Subsidies & Contributions	1,294,809	1,309,773	14,964
42.0	Insurance Claims & Indemnities	0	0	0
43.0	Interest & Dividends	1	1	0
44.0	Refunds	0	0	0
	Subtotal Non-Pay Costs	**$1,507,664**	**$1,529,128**	**$21,464**
	Total Budget Authority by Object Class	**$1,585,797**	**$1,608,461**	**$22,664**

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

NATIONAL INSTITUTES OF HEALTH
National Institute of Neurological Disorders and Stroke

Salaries and Expenses
(Dollars in Thousands)

OBJECT CLASSES	FY 2014 Enacted	FY 2015 President's Budget	FY 2015 +/- FY 2014
Personnel Compensation			
Full-Time Permanent (11.1)	$29,038	$29,329	$290
Other Than Full-Time Permanent (11.3)	22,856	23,085	229
Other Personnel Compensation (11.5)	769	777	8
Military Personnel (11.7)	535	541	5
Special Personnel Services Payments (11.8)	7,807	7,885	78
Subtotal Personnel Compensation (11.9)	**$61,006**	**$61,616**	**$610**
Civilian Personnel Benefits (12.1)	$16,745	$17,332	$586
Military Personnel Benefits (12.2)	381	385	4
Benefits to Former Personnel (13.0)	0	0	0
Subtotal Pay Costs	**$78,133**	**$79,333**	**$1,200**
Travel & Transportation of Persons (21.0)	$3,721	$3,784	$63
Transportation of Things (22.0)	274	279	5
Rental Payments to Others (23.2)	97	98	2
Communications, Utilities & Misc. Charges (23.3)	685	697	12
Printing & Reproduction (24.0)	2	2	0
Other Contractual Services:			
Consultant Services (25.1)	2,758	2,805	47
Other Services (25.2)	16,940	17,220	280
Purchases from government accounts (25.3)	100,365	96,988	-3,377
Operation & Maintenance of Facilities (25.4)	1,380	1,403	23
Operation & Maintenance of Equipment (25.7)	13,896	14,132	236
Subsistence & Support of Persons (25.8)	0	0	0
Subtotal Other Contractual Services	**$135,338**	**$132,547**	**-$2,791**
Supplies & Materials (26.0)	$9,151	$9,307	$156
Subtotal Non-Pay Costs	**$149,268**	**$146,714**	**-$2,554**
Total Administrative Costs	**$227,401**	**$226,047**	**-$1,354**

NATIONAL INSTITUTES OF HEALTH
National Institute of Neurological Disorders and Stroke

Detail of Full-Time Equivalent Employment (FTE)

OFFICE/DIVISION	FY 2013 Actual			FY 2014 Est.			FY 2015 Est.		
	Civilian	Military	Total	Civilian	Military	Total	Civilian	Military	Total
Division of Extramural Research									
Direct:	105		105	105		105	105		105
Reimbursable:			-			-			-
Total:	105		105	105		105	105		105
Division of Intramural Research									
Direct:	329	5	334	329	5	334	329	5	334
Reimbursable:			-			-			-
Total:	329	5	334	329	5	334	329	5	334
Office of Clinical Research									
Direct:	18		18	18		18	18		18
Reimbursable:			-			-			-
Total:	18		18	18		18	18		18
Office of Special Programs in Diversity									
Direct:	3		3	3		3	3		3
Reimbursable:			-			-			-
Total:	3		3	3		3	3		3
Office of the Director									
Direct:	49		49	49		49	49		49
Reimbursable:			-			-			-
Total:	49		49	49		49	49		49
Office of Translational Research									
Direct:	16		16	16		16	16		16
Reimbursable:			-			-			-
Total:	16		16	16		16	16		16
Total	520	5	525	520	5	525	520	5	525
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
2011	11.8
2012	13.4
2013	12.0
2014	12.0
2015	12.0

NATIONAL INSTITUTES OF HEALTH
National Institute of Neurological Disorders and Stroke

Detail of Positions

GRADE	FY 2013 Actual	FY 2014 Enacted	FY 2015 President's Budget
Total, ES Positions	1	1	1
Total, ES Salary	179,700	179,700	179,700
GM/GS-15	36	38	38
GM/GS-14	56	54	54
GM/GS-13	78	80	80
GS-12	59	57	57
GS-11	33	35	35
GS-10	5	5	5
GS-9	28	26	26
GS-8	22	22	22
GS-7	12	12	12
GS-6	2	2	2
GS-5	0	0	0
GS-4	1	1	1
GS-3	1	1	1
GS-2	0	0	0
GS-1	0	0	0
Subtotal	333	333	333
Grades established by Act of July 1, 1944 (42 U.S.C. 207)	0	0	0
Assistant Surgeon General	0	0	0
Director Grade	3	3	3
Senior Grade	0	0	0
Full Grade	1	1	1
Senior Assistant Grade	1	1	1
Assistant Grade	0	0	0
Subtotal	5	5	5
Ungraded	0	0	0
Total permanent positions	338	338	338
Total positions, end of year	554	554	554
Total full-time equivalent (FTE) employment, end of year	525	525	525
Average ES salary	179,700	179,700	179,700
Average GM/GS grade	12.0	12.0	12.0
Average GM/GS salary	97,027	98,025	98,025

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