DEPARTMENT OF HEALTH AND HUMAN SERVICES

NATIONAL INSTITUTES OF HEALTH

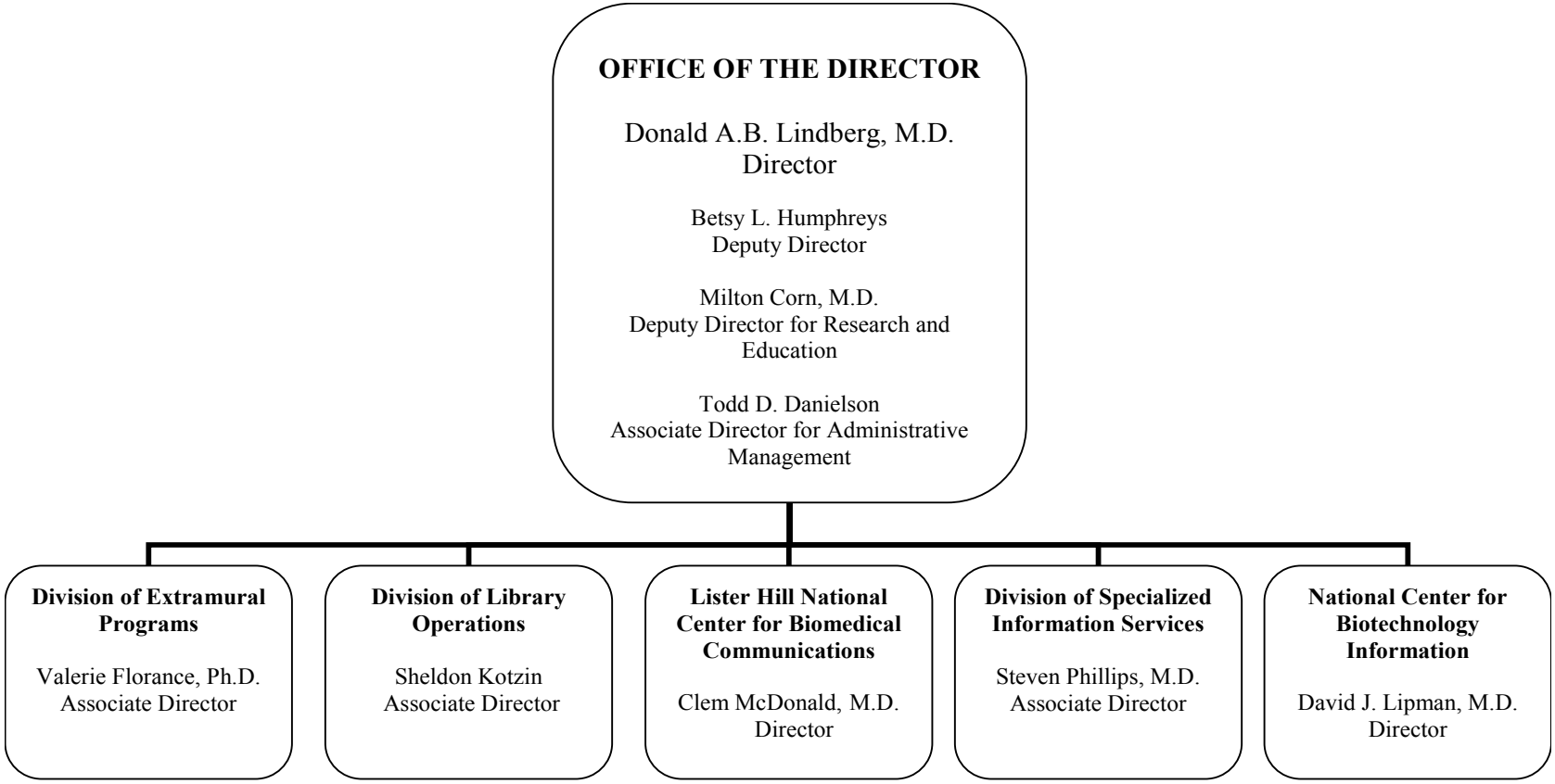
National Library of Medicine (NLM)

FY 2013 Budget — Page No.

NATIONAL INSTITUTES OF HEALTH

NATIONAL LIBRARY OF MEDICINE

ORGANIZATION STRUCTURE



NATIONAL INSTITUTES OF HEALTH

National Library of Medicine

For carrying out section 301 and title IV of the PHS Act with respect to health information communications, [$338,278,000] *$372,651,000*, of which $4,000,000 shall be available until September 30, [2013] *2014*, for improvement of information systems: *Provided*, That in fiscal year [2012] *2013*, the National Library of Medicine may enter into personal services contracts for the provisions of services in facilities owned, operated, or constructed under the jurisdiction of the National Institutes of Health (referred to in this title as "NIH"): *Provided further*, that in addition to amounts provided herein, $8,200,000 shall be available from amounts available under section 241 of the PHS Act to carry out the purposes of the National Information Center on Health Services Research and Health Care Technology established under section 478A of the PHS Act and related health services. *(Department of Health and Human Services Appropriations Act, 2012.)*

NATIONAL INSTITUTES OF HEALTH
National Library of Medicine

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

Source of Funding	FY 2011 Actual	FY 2012 Enacted	FY 2013 PB
Appropriation	339,716	338,278	372,651
Type 1 Diabetes	0	0	0
Rescission	(2,983)	(639)	0
Supplemental	0	0	0
Subtotal, adjusted appropriation	336,733	337,639	372,651
Real transfer under Secretary's transfer authority	0	(96)	0
Comparative Transfers for NCATS reorganization	0	0	0
Comparative Transfers to NCATS for Therapeutics and Rare and Neglected Diseases (TRND)	(277)	0	0
Comparative Transfers to NLM for NCBI and Public Access	26,000	27,500	0
Subtotal, adjusted budget authority	362,456	365,043	372,651
Unobligated balance, start of year	0	0	0
Unobligated balance, end of year	0	0	0
Subtotal, adjusted budget authority	362,456	365,043	372,651
Unobligated balance lapsing	(73)	0	0
Total obligations	362,383	365,043	372,651

[1] Excludes the following amounts for reimbursable activities carried out by this account:
FY 2011 - $54,781 FY 2012 - $60,000 FY 2013 - $61,998
Excludes $850.00 in FY 2011 for royalties.

NATIONAL INSTITUTES OF HEALTH

National Library of Medicine

Budget Mechanism - Total [1/]

(Dollars in Thousands)

MECHANISM	FY 2011 Actual		FY 2012 Enacted		FY 2013 PB		Change vs. FY 2012	
	No.	Amount	No.	Amount	No.	Amount	No.	Amount
Research Grants								
Research Projects								
Noncompeting	55	$18,354	55	$18,165	49	$17,983	(6)	($182)
Administrative Supplements	*0*	0	*0*	0	*0*	0	*0*	0
Competing:								
Renewal	1	501	0	0	0	0	0	0
New	18	5,640	19	6,141	21	6,714	2	573
Supplements	0	0	0	0	0	0	0	0
Subtotal, Competing	19	$6,141	19	$6,141	21	$6,714	2	$573
Subtotal, RPGs	74	$24,495	74	$24,306	70	$24,697	(4)	$391
SBIR/STTR	6	$822	6	$717	6	$753	0	$36
Research Project Grants	80	$25,317	80	$25,023	76	$25,450	(4)	$427
Research Centers								
Specialized/Comprehensive	0	$1,128	0	$2,096	0	$3,363	0	$1,267
Clinical Research	0	0	0	0	0	0	0	0
Biotechnology	0	0	0	0	0	0	0	0
Comparative Medicine	0	0	0	0	0	0	0	0
Research Centers in Minority Institutions	0	0	0	0	0	0	0	0
Research Centers	0	$1,128	0	$2,096	0	$3,363	0	$1,267
Other Research								
Research Careers	6	$633	6	$620	3	$310	(3)	($310)
Cancer Education	0	0	0	0	0	0	0	0
Cooperative Clinical Research	0	0	0	0	0	0	0	0
Biomedical Research Support	4	2,024	2	1,286	2	1,323	0	37
Minority Biomedical Research Support	0	0	0	0	0	0	0	0
Other	51	14,979	51	15,059	51	14,871	0	(188)
Other Research	61	$17,636	59	$16,965	56	$16,504	(3)	($461)
Total Research Grants	141	$44,081	139	$44,084	132	$45,317	(7)	$1,233
Research Training	FTTPs		FTTPs		FTTPs			
Individual Awards	0	$0	0	$0	0	$0	0	$0
Institutional Awards	0	0	0	0	0	0	0	0
Total Research Training	0	$0	0	$0	0	$0	0	$0
Research & Development Contracts	10	$18,145	10	$18,327	10	$18,330	0	$3
SBIR/STTR	*0*	*$0*	*0*	*$0*	*0*	*$0*	*0*	*$0*
	FTEs		FTEs		FTEs		FTEs	
Intramural Programs	705	$285,975	705	$288,377	697	$294,749	(8)	$6,372
Research Management and Support	99	14,255	99	14,255	99	14,255	0	0
Construction		0		0		0		0
Buildings and Facilities		0		0		0		0
Total, NLM	804	$362,456	804	$365,043	796	$372,651	(8)	$7,608

1/ All items in italics are "non-adds"; items in parenthesis are subtractions.

Major Changes in the Fiscal Year 2013 President's Budget Request

Major changes by budget mechanism and/or budget activity detail are described below. Note that there may be overlap between budget mechanism and activity detail and these highlights will not sum to the total change for the FY 2013 President's budget request for NLM, which is $7.608 million over the FY 2012 Enacted level, for a total of $372.651 million.

Extramural Programs, Specialized Research Centers (+$1.267 million, total $3.363 million): NLM will support the full cost of the NIH Roadmap National Center for Biomedical Computing (NCBC) located at Harvard Medical School. The Center, which is called i2b2 (Informatics for Integrating Biology and the Bedside), is managed administratively by NLM. Each year since FY 2010, when the continuation award was made to i2b2, the NIH Common Fund co-funding has been reduced by 25 percent. In FY 2013, the final year of the grant, NLM will pay the full cost of the grant.

Intramural Programs (+$6.372 million; total $294.749 million): Funds ($35.7 million) have been specifically included in NLM's budget request to allow the National Center for Biotechnology Information (NCBI) to meet the challenge of collecting, organizing, analyzing, and disseminating the deluge of data emanating from research in molecular biology and genomics. The additional funds will take the place of the funds that are now obtained from other NIH sources and transferred to NLM in the year of execution. Providing direct funding to NLM decreases administrative burden, increases transparency and enhances NCBI's ability to provide an integrated, genomic information resource for biomedical researchers at NIH and around the world. Additionally, NLM will support incremental cost of literature purchases and contractual services in order to maintain its national biomedical information services, including the development and dissemination of molecular biology and genomic information and other services that provide access to the results of research.

NATIONAL INSTITUTES OF HEALTH
National Library of Medicine
Summary of Changes
(Dollars in Thousands)

FY 2012 Enacted				**$365,043**
FY 2013 President's Budget				**$372,651**
Net change				**$7,608**
	2013 President's Budget		**Change from FY 2012**	
CHANGES	**FTEs**	**Budget Authority**	**FTEs**	**Budget Authority**
A. Built-in:				
1. Intramural Programs:				
a. Annualization of January 2012 pay increase & benefits		$90,789		$0
b. January FY 2013 pay increase & benefits		90,789		270
c. One more day of pay		90,789		351
d. Annualization of PY net hires		90,789		0
e. Payment for centrally furnished services		0		0
f. Increased cost of laboratory supplies, materials, other expenses, and non-recurring costs		203,960		0
Subtotal				$621
2. Research Management and Support:				
a. Annualization of January 2012 pay increase & benefits		$9,435		$0
b. January FY 2013 pay increase & benefits		9,435		28
c. One more day of pay		9,435		36
d. Annualization of PY net hires		9,435		0
e. Payment for centrally furnished services		0		0
f. Increased cost of laboratory supplies, materials, other expenses, and non-recurring costs		4,820		0
Subtotal				$64
Subtotal, Built-in				$685

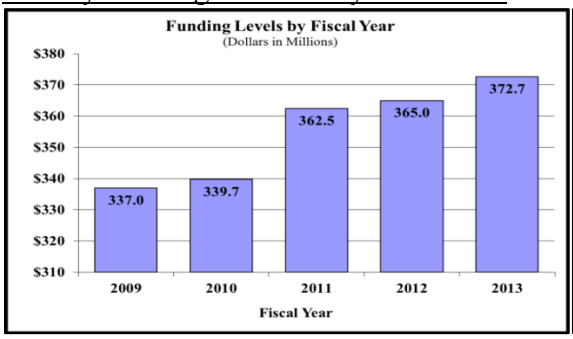
NATIONAL INSTITUTES OF HEALTH
National Library of Medicine

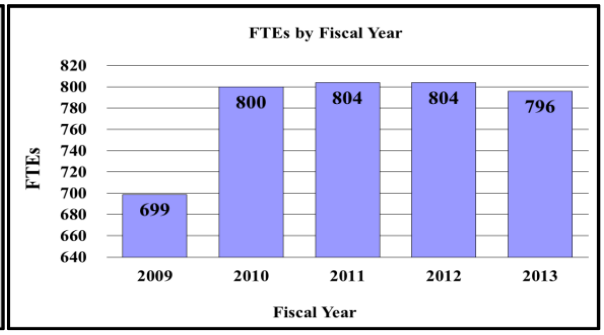
Summary of Changes--continued

CHANGES	2013 President's Budget No.	2013 President's Budget Amount	Change from FY 2012 No.	Change from FY 2012 Amount
B. Program:				
1. Research Project Grants:				
a. Noncompeting	49	$17,983	(6)	($182)
b. Competing	21	6,714	2	573
c. SBIR/STTR	6	753	0	36
Total	76	$25,450	(4)	$427
2. Research Centers	0	$3,363	0	$1,267
3. Other Research	56	16,504	(3)	(461)
4. Research Training	0	0	0	0
5. Research and development contracts	10	18,330	0	3
Subtotal, Extramural		$63,647		$1,236
	FTEs		FTEs	
6. Intramural Programs	697	$294,749	(8)	$5,751
7. Research Management and Support	99	14,255	0	(64)
8. Construction		0		0
9. Buildings and Facilities		0		0
Subtotal, program	796	$372,651	(8)	$6,923
Total changes				$7,608

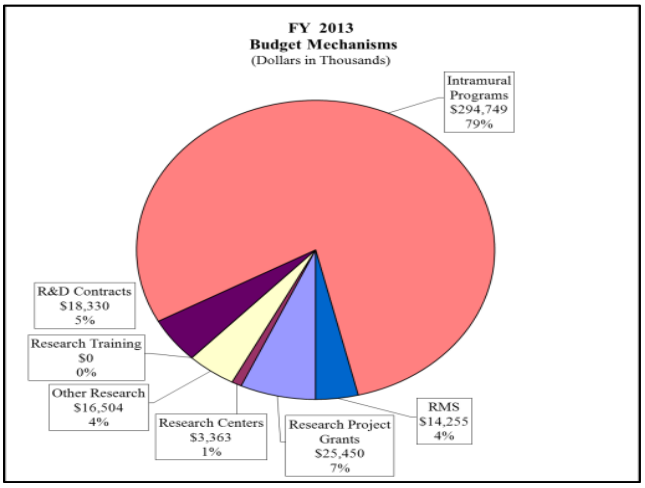
Fiscal Year 2013 Budget Graphs

History of Budget Authority and FTEs:

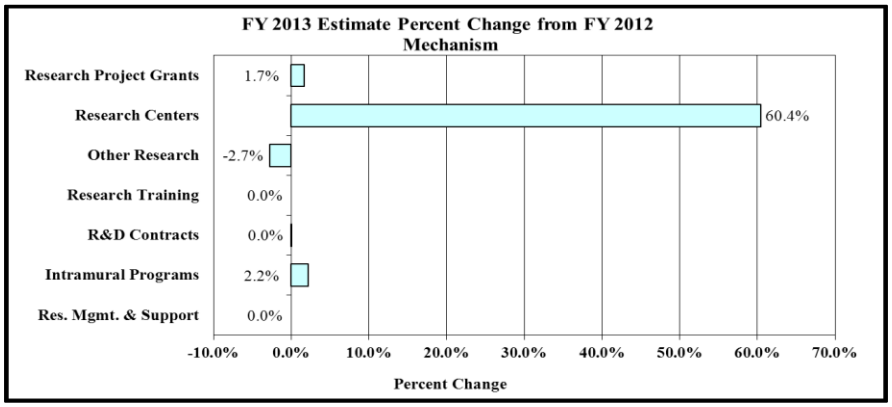




Distribution by Mechanism:



Change by Selected Mechanisms:



NATIONAL INSTITUTES OF HEALTH
National Library of Medicine
Budget Authority by Activity
(Dollars in Thousands)

	FY 2011 Actual		FY 2012 Enacted		FY 2013 PB		Change vs. FY 2012 Enacted	
Extramural Research	**FTEs**	**Amount**	**FTEs**	**Amount**	**FTEs**	**Amount**	**FTEs**	**Amount**
Detail:								
Health Information for Health Professionals and Public (NN/LM)		**$12,182**		**$12,182**		**$12,182**		**0**
Informatics Infrastructure		**18,964**		**19,258**		**20,064**		**806**
Informatics Research		31,080		30,971		31,401		430
Subtotal, Extramural		$62,226		$62,411		$63,647		$1,236
Intramural Programs	705	$285,975	705	$288,377	697	$294,749	(8)	$6,372
Research Management & Support	99	$14,255	99	$14,255	99	$14,255	0	$0
TOTAL	804	$362,456	804	$365,043	796	$372,651	(8)	$7,608

1. Includes FTEs which are reimbursed from the NIH Common Fund.
2. Includes Real Transfers and Comparable Adjustments as detailed in the "Amounts Available for Obligation" table.

NATIONAL INSTITUTES OF HEALTH
National Library of Medicine

Authorizing Legislation

	PHS Act/ Other Citation	U.S. Code Citation	2012 Amount Authorized	FY 2012 Enacted	2013 Amount Authorized	FY 2013 PB
Research and Investigation	Section 301	42§241	Indefinite	$365,043,000	Indefinite	$372,651,000
National Library of Medicine	Section 401(a)	42§281	Indefinite		Indefinite	
Total, Budget Authority				$365,043,000		$372,651,000

NATIONAL INSTITUTES OF HEALTH
National Library of Medicine

Appropriations History

Fiscal Year	Budget Estimate to Congress	House Allowance	Senate Allowance	Appropriation
2004	$315,401,000	$315,401,000	$319,396,000	$311,635,000
Rescission				($2,520,000)
2005	$316,947,000	$316,947,000	$316,900,000	$317,947,000
Rescission				($2,801,000)
2006	$318,091,000	$318,091,000	$327,247,000	$318,091,000
Rescission				($3,181,000)
2007	$313,269,000	$313,269,000	$315,294,000	$320,850,000
Rescission				$0
2008	$312,562,000	$325,484,000	$327,817,000	$326,669,000
Rescission				($5,707,000)
Supplemental				$1,705,000
2009	$323,046,000	$331,847,000	$329,996,000	$330,771,000
Rescission				$0
2010	$334,347,000	$342,585,000	$336,417,000	$339,716,000
Rescission				$0
2011	$364,802,000		$364,254,000	$339,716,000
Rescission				($2,982,909)
2012	$387,153,000	$387,153,000	$358,979,000	$338,278,000
Rescission				($639,345)
2013	$372,651,000			

Justification of Budget Request

National Library of Medicine

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

Budget Authority:

	FY 2011 Actual	FY 2012 Enacted	FY 2013 President's Budget	FY 2013 +/- FY 2012
BA	$362,456,000	$365,043,000	$372,651,000	+$7,608,000
Total Obligations	804	804	796	-8

Director's Overview

The National Library of Medicine (NLM):

- produces electronic information resources that are searched billions of times by millions of people each year;
- supports and conducts research, development, and training in biomedical informatics and health information technology; and
- is the world's largest biomedical library and coordinator of a 6,000-member National Network of Libraries of Medicine that promotes and provides access to health information in communities with significant health disparities across the United States.

Through advanced information systems, a cutting-edge informatics research portfolio, and extensive partnerships, NLM plays a pivotal role in catalyzing and supporting the translation of basic science into new treatments, improved practice, useful decision support for health professionals and patients, and effective disaster and emergency preparedness and response.

NLM's advanced information systems disseminate an enormous range of information, including genetic, genomic, chemical, toxicology, and clinical research data; images; published and unpublished research results; decision support resources; standards for scientific and health data and publications; informatics tools for system developers; and high quality health information for the public. The Library describes and organizes information produced by - and available from - government agencies, NIH-funded scientists, universities, non-profit organizations, commercial publishers, and the nation's libraries. Scientists, health professionals, and members of the public can search or download much of this information directly from an NLM website, find it via an Internet search engine, or use an externally developed "app" that provides value-added access to NLM data. Thousands of commercial and non-profit system developers regularly use the applications programming interfaces (APIs) that NLM provides to promote innovation and facilitate use of its high quality information in products and services produced by others.

NLM's large and rapidly expanding stores of electronic scientific data, research results, and high quality health information, coupled with the growing availability of stores of standardized

electronic health records, provide extraordinary scientific opportunities to increase understanding of disease onset and progression, to identify new therapeutic avenues, and to speed the translation of such discoveries into improved health and health care.

Support of NIH Director's Themes:

Overall Theme: Extraordinary Scientific Opportunities

Theme 1: Investing in Basic Research
Accelerating research progress in areas such as genomics, proteomics, and metabolomics depends upon new approaches for characterizing, visualizing, and representing biomedical data and images and in understanding the way humans interact with biomedical information. Basic research in computer, information, and engineering sciences is needed to address the scale, complexity, and heterogeneous nature of biomedical and behavioral data related to health. Currently, informatics funding by other agencies does not consistently address health-specific needs. Within NIH, Institutes and Centers support informatics as it applies to their mission areas. NLM focuses on more basic, proof-of-concept informatics research that can be applied in areas of general biomedical importance.

Theme 2: Accelerating Discovery Through Technology
NLM's National Center for Biotechnology Information (NCBI) promotes scientific discovery by organizing and providing rapid access for scientists to massive amounts of genetic sequence data resulting from new high-throughput sequencing technologies that allow complete genomes to be sequenced in days rather than years. Through its intramural research programs within NCBI and the Lister Hill National Center for Biomedical Communications (LHC) and through extramural grants, NLM supports the development of advanced computational tools and methods for sophisticated analysis of complex molecular biology data, electronic health records, and clinical images to accelerate discovery of the role of genetics and the environment in health and disease.

Theme 3: Accelerating Translational Sciences
Clinical trials play a critical role in translating research discoveries into effective treatments. With information on more than 117,000 research studies in 178 countries, NLM's ClinicalTrials.gov is the world's most comprehensive source of information about clinical trials, serving scientists, health professionals and the public. In accordance with the Food and Drug Administration Amendments Act of 2007, ClinicalTrials.gov accepts submission of summary results data in addition to trial registrations, currently providing access to results from more than 5,000 registered trials of drugs and devices, with 60 results records submitted each week. ClinicalTrials.gov enhances the transparency of clinical trial information and provides a unique overview of the current state of clinical trials and trends in trial design, size, focus, and methodology that can help identify promising opportunities for investment and innovation in clinical research.

NLM is a primary source for results of comparative effectiveness research, providing access to evidence on best practices to improve patient safety and health care quality. Recent expansions in resources for clinical effectiveness information include PubMed Health, which includes guidelines, evidence summaries, and systematic reviews from government agencies and other relevant organizations around the world. NLM extramural grants support informatics research to

enhance electronic health records, support integration and mining of large data sets from health care and basic biomedical research, and organize and present evidence that helps health care providers, patients, and consumers make sound health decisions. Building on more than two decades of work on standard medical terminologies in the Unified Medical Language System (UMLS), NLM's intramural research program on personal health records explores methods to help individuals use evidence to manage their own health, convey important information to their health care teams, and generate standardized data to speed scientific discovery.

Theme 4: Encouraging New Investigators and New Ideas
NLM's funding announcements attract a relatively high percentage of high quality new investigators from a broad range of scientific fields. The Library is the principal supporter of training for informatics research careers at 18 universities across the country. NLM also actively promotes a broad spectrum of careers in science and medicine to young people, through such mechanisms as: development of K-12 curriculum materials, special educational programs associated with NLM exhibitions, summer research experiences for high school and college students, and use of high-school peer tutors in health information outreach projects.

Overall Budget Policy**:** The FY 2013 President's Budget request for NLM is $372.651 million, an increase of $7.608 million or 2.1 percent over the FY 2012 Enacted Level. Increased funding in FY 2013 will be devoted to processing and organizing by the National Center for Biotechnology Information the deluge of new scientific data resulting from NIH-wide investments in high throughput technologies. NLM's highest priority is maintaining the quality and integrity of the Library's national collection of biomedical information and its many heavily used electronic databases. NLM's intramural program focuses on building and providing access to these essential services and comprises 79.1 percent of the NLM budget. Funds for extramural grants increase by $1.236 million in FY 2013 and the Library will continue to support the National Network of Libraries of Medicine and its role in improving U.S.-wide access and use of health information in communities across the nation; to support pre- and post-doctoral informatics research training for the biomedical community; and to invest in new investigators and competing RPGs through informatics research grants.

Funds are included in R&D contracts to support trans-NIH initiatives, such as the Basic Behavioral and Social Sciences Opportunity Network (OppNet).

Program Descriptions and Accomplishments

INTRAMURAL PROGRAMS
NLM's intramural programs acquire, organize, preserve, and provide access to the world's biomedical literature no matter the medium. NLM serves as a leading resource for molecular biology, genomic, and clinical trials information; provides information services on toxicology, disaster preparedness, and environmental health; and conducts research and develops systems, technologies, and networks for information access by scientists, health professionals, patients, and the general public.

Delivering Reliable, High Quality Biomedical and Health Information Services: At the core of NLM is the world's largest, continually expanding collection of biomedical literature and a broad array of authoritative databases for health professionals, scientists, the public, and the librarians and information specialists who serve them. NLM develops and uses sophisticated information systems to support the complex, high volume operations necessary to acquire, describe, index, and provide rapid access to materials in its collections and to build and refine electronic databases and services for many different audiences.

In FY 2011, NLM greatly expanded the quantity and range of high quality information readily available to scientists, health professionals, and the general public. Major advances included: expansion of the NCBI's Entrez system, an integrated collection of some 40 databases and 570 million records of molecular and genomic data; coordination with NIH institutes for deposition of high-throughput sequencing data from projects they fund; development of dbVar and other new resources that house the growing body of data relating to genetic variation; continued support for PubChem, the archive of chemical and biological data from the NIH Molecular Libraries Roadmap initiative, which now contains more than 30 million unique chemical structures and half a million bioassays; a significant increase in the number of full-text articles in PubMed Central, which now provides public access to more than 2.3 million research articles, including those produced by NIH-funded researchers; improved access for the public to the results of clinical effectiveness research and systematic reviews; maintenance of medlineplus4you on Twitter, a companion to NLM's popular and respected consumer health Web site, MedlinePlus.gov, as one of several initiatives to use social media to reach new audiences that can benefit from high quality, understandable health information; continued expansion of ClinicalTrials.gov to encompass summary results and adverse event information from a growing number of clinical trials of FDA-regulated products; and development of new information services on the impact of the Gulf Oil Spill, the earthquake in Haiti, women's health issues, disaster preparation and response, and other important topics. Mobile applications and social media were also used to disseminate many of these resources.

Budget Policy: The FY 2013 President's Budget request is $123.378 million, an increase of $0.173 million or 0.1 percent over the FY 2012 Enacted level of $123.205 million. In FY 2013, the Library will concentrate on maintaining its current level of services and its most heavily used resources, including Medline/PubMed and PubMed Central, which provide critical access to published biomedical research results worldwide. Another key service, MedlinePlus, contains a wide range of information written and formatted for consumers. Keeping MedlinePlus current with new information (in English, Spanish, and other languages) from NIH and other reliable sources is a high priority in FY 2013. NLM will continue to maintain ClinicalTrials.gov in FY 2013 to accommodate increasing submissions of summary results in accordance with the Food and Drug Administration Amendments Act of 2007.

Program Portrait: **Health Data Standards for Interoperable Health Information Technology**

FY 2012 Level: $15.6 million
FY 2013 Level: $15.6 million
Change: $0 million

In close collaboration with the Office of the National Coordinator for Health Information Technology, within HHS, NLM provides ongoing funding for the clinical terminologies designated as U.S. standards for meaningful use of electronic health records (EHRs) and health information exchange. NLM's support allows these standards to be updated regularly to reflect new drugs, tests, and changes in biomedical knowledge and health practice – and also allows them to be used free-of-charge in U.S. systems that support health care, public health, and biomedical research. NLM produces a growing number of convenient vocabulary subsets to help EHR developers and users transition to use vocabulary standards, including, for example, subsets of frequently encountered patient problems, frequently ordered tests, and medications currently available in the U.S. market. The inclusion of standard terminology in EHRs enables more effective clinical decision support by making it easier to link information in a patient's record to the knowledge relevant to that record. NLM's MedlinePlus Connect service allows EHR vendors to connect their products directly to NLM's high quality information relevant to a patient's problems, medications, and test results. In 2011, NLM helped to establish policies that facilitate the use of standard clinical terminology in international genomic research databases, and in common data elements and patient assessment instruments used in NIH-funded research. Use of NLM's Unified Medical Language System (UMLS) resources provide essential infrastructure for advanced clinical decision support by connecting standard clinical terminologies to billing codes and more than 120 other important biomedical vocabularies, such as those used in information retrieval and gene annotation. By linking the many different terms used to represent the same concepts and by providing associated natural language processing programs, NLM's UMLS resources help computer programs to interpret biomedical text correctly. These resources are heavily used in NIH-funded research; in commercial products and developments, including IBM's Watson question answering system; and in many electronic information services, including those produced by NLM.

Promoting Public Awareness and Access to Information: The NLM has extensive outreach programs to enhance awareness of NLM's diverse information services among biomedical researchers, health professionals, librarians, patients, and the public. To improve access to high quality health information, NLM utilizes its National Network of Libraries of Medicine as well as formal partnerships such as Partners in Information Access for the Public Health Workforce and the Environmental Health Information Outreach Partnership with Historically Black Colleges and Universities, tribal colleges, and other minority serving institutions. NLM also fosters informal community partnerships and uses exhibitions, the media, and new technologies in its efforts to reach underserved populations and to promote young people's interest in careers in science, medicine, and technology. Recently, NLM opened a major new exhibition, *Native Voices: Native Peoples' Concepts of Health and Illness,* as part of its outreach efforts to populations that suffer from serious health disparities and in response to Congressional interest in ensuring the documentation of traditional Native Hawaiian healing practices. NLM continues to expand its successful traveling exhibitions program as another means of enhancing access to the Library's services and promoting interest in careers in science and medicine in communities across the country. Examples include the highly popular *Harry Potter's World: Renaissance Science, Magic, and Medicine*, and *Life and Limb: The Toll of the Civil War*, one of two recently added exhibits to coincide with the 150th anniversary of that conflict.

As part of its outreach efforts, NLM also continually solicits feedback from users on how existing resources can be improved. In FY 2011, dozens of community-based projects were

funded across the country to enhance awareness and access to health information, using a combination of high tech and "high touch" approaches. With assistance from other NIH components and outside partners, NLM continues to increase the distribution of the NIH MedlinePlus magazine. The magazine, which is also available online in Spanish and English, is distributed to doctors' offices, health science libraries, the Congress, the media, federally supported community health centers, select hospital emergency and waiting rooms, and other locations where the public receives health services nationwide.This past year, NLM and NIH continued to partner with the National Hispanic Medical Association, the American Diabetes Association, the Peripheral Arterial Disease Coalition, among others, to extend the distribution of the magazine to the audiences they serve. Depending on partners for each issue, between 300,000 and 600,000 copies of the quarterly magazine are distributed and reach more than 5 million readers across America.

Budget Policy: The FY 2013 President's Budget request is $5.169 million, an increase of $0.106 million or 2.1 percent from the FY 2012 Enacted level of $5.063 million. In FY 2013, NLM will continue its outreach programs with a special emphasis on those aimed at underserved and minority populations. As recommended by its 2006-2016 Long Range Plan, NLM will develop and test innovative outreach methods, including infrastructure improvements (for example, PDAs, intelligent agents, and network techniques) to "enable ubiquitous health information access in homes, schools, public libraries, and work places." Also as recommended in the Plan, the Library will continue to use its major historical exhibitions as a means for improving science and health literacy and promoting interest in biomedical careers, as well as increasing awareness and use of NLM information services.

Developing Advanced Information Systems, Standards and Research Tools: The NLM's advanced information services have long benefitted from its intramural research and R&D programs. The Library has two organizations that conduct advanced R&D on different aspects of biomedical communication—LHC and the NCBI.

LHC, established in 1968, conducts and supports research in such areas as the development and dissemination of health information technology standards; the dissemination, processing, and use of high quality imagery; medical language processing; high-speed access to biomedical information; and advanced technology for emergency and disaster management. Imaging tools developed by NLM's LHC, for example in colposcopy, are integral to training and testing proficiency in medical schools and residency programs across the country. In addition to its ground-breaking research in natural language processing and medical image processing, LHC has also made advances that will facilitate health information exchange and meaningful use of EHRs. LHC researchers used frequency data from multiple health care organizations to produce more useful, manageable subsets of large standard clinical vocabularies; worked with other HHS agencies to assist two states in testing NLM-developed guidance for standardizing newborn screening data; and established partnerships to test the use and impact of personal health records.

NCBI, created in 1988, conducts R&D on the representation, integration, and retrieval of molecular biology data and biomedical literature; provides an integrated, genomic information resource for biomedical researchers at NIH and around the world; and conducts basic research in computational biology. NCBI continues to expand its resources, which include more than 40

integrated biomedical databases, to support the accelerated pace of research made possible by new technologies such as next-generation DNA sequencing, microarrays, and small molecule screening. NCBI is one of the world's largest repositories of DNA sequence information, ranging from data on microorganisms to analyses of human genomes. Access to these data and data from associated NCBI databases, such dbGaP, PubChem, and numerous other protein and gene databases, all of which are linked to the scientific literature, provide the foundation for researchers to accelerate the rate of discovery and facilitate the translation of basic science into new diagnostics and treatments.

Through its intramural and extramural programs, NLM has been a leader in natural language understanding and biomedical text mining research over the past two decades, developing and sharing innovative algorithms, resources, and tools, including the UMLS, MetaMap, Medical Text Indexer (MTI) and SemRep. This research has been applied to indexing, information retrieval, question answering, and literature-based discovery. For example, MTI plays a crucial role in indexing MEDLINE citations at NLM, and the output of SemRep is used in the development of clinical guidelines. There is growing evidence of the utility of text mining techniques in the clinical domain. For example, application of text-mining techniques developed by NLM-funded researchers and applied in the NHGRI-supported eMERGE Network , has recently demonstrated that combining genotype information with phenotype information extracted from electronic medical records is not only a viable way to study the relationship between genome-wide genetic variation and common human traits, but is also 100 times more cost-effective than the traditional genome-wide association studies (GWAS).

NLM intends to expand text mining research activities in support of literature and clinical text processing. This effort involves (1) developing methods specially adapted to clinical narratives; (2) refining existing methods for more effective support of NLM library services; (3) developing health-related question answering applications; and (4) adapting tools to high-throughput processing of the vast amount of text in electronic health records and large repositories of biomedical articles ("big data"). Other activities include developing partnerships with other ICs, (e.g., the NIH Clinical Center for the analysis of its clinical data warehouse, the Biomedical Translational Research Information System, or BTRIS) and agencies (e.g., Department of Veterans Affairs). Examples of clinical analyses supported by text mining include cohort selection (e.g., identifying post-traumatic stress disorder patients), detection of adverse events, and pharmacovigilance. NLM's work will aim to develop modular software components that are compatible with standard frameworks for text mining (e.g., the Unstructured Information Management Architecture, or UIMA).

Budget Policy: The FY 2013 President's Budget request is $166.202 million, an increase of $6.093 million or 3.8 percent from the FY 2012 Enacted level of $160.109 million. The additional funds will be used by NCBI and will take the place of the funds that are now obtained from other NIH sources in order to process the enormous quantities of data emanating from new NIH-funded sequencing, microarray, and small molecule screening technologies. In accordance with its 2006-2016 Long Range Plan, NLM's research divisions will engage in critical R&D projects that are important to today's scientific community and that will have even greater influence in the future. In addition to NCBI's trans-NIH collaborations, other NLM intramural researchers will continue to improve access to clinical trials data; pursue disaster management

information research in partnership with the NIH Clinical Center, the Department of Defense, and Suburban Hospital; to develop advanced imaging tools for cancer diagnosis in cooperation with the National Cancer Institute; and to work with NIH-funded Clinical and Translational Research Centers on health data standardization issues. The Library will continue to serve as an HHS coordinating center for standard clinical vocabularies; to support, develop, or license for U.S.-wide use key clinical vocabularies, including SNOMED CT®; and to develop and test tools and subsets to promote meaningful use of electronic health records.

Program Portrait: **Meeting the Data Challenges of New Genomic Technologies at the National Center of Biotechnology Information (NCBI)**

FY 2012 Level: $95.8 million
FY 2013 Level: $104.0 million
Change: +$8.2 million

Genomic research is producing data that are both massive and complex. The successful management of genomic data is essential for its sharing, analysis, and distribution. This data is critical for basic discovery research and for discovering the causes of disease and identifying targets for new therapeutics. NCBI's role in organizing, analyzing, and making such voluminous data accessible represents a critical link in the chain for discovering important new associations between genetic variation and disease and in translating that information into potential clinical applications. NCBI, through the Database of Genotype and Phenotype (dbGaP), has developed an architecture for including large-scale individual genomic data, with detailed individual phenotype information and methods of controlled access to protect the confidentiality of participant data. dbGaP has become the framework for NIH policies for broad sharing of human genetic and genomic data and has worked in conjunction with the Sequence Read Archive to offer controlled access to individual-level high- throughput data.

Among the newest resources in development is ClinVar, a database of information about known clinically important genetic variations. ClinVar's goal is to facilitate access to and communication about the relationships between human genetic variation and observed health status. ClinVar will complement the Genetic Testing Registry, a new resource that will provide a central location for test developers and laboratories to submit information voluntarily about the availability and scientific basis of their genetic tests.

With more than a million daily users accessing NCBI's databases and downloading more than 4 terabytes of data per day, NCBI is the hub of a national and international network for molecular biology information. NCBI performs cutting edge research in the rapidly evolving field of computational biology and is assisting hundreds of thousands of researchers around the world in identifying disease-related genes and in developing strategies for treating and preventing disease.

EXTRAMURAL PROGRAMS

NLM's Extramural programs focus on three priority areas: (1) biomedical informatics research to develop and test sophisticated computational approaches for acquiring, integrating, managing, mining, and presenting biomedical data, information, and knowledge; (2) training and career transition programs for research careers in biomedical informatics; and (3) early support for novel biomedical knowledge resources. To accomplish its extramural goals in FY 2013, NLM will offer grants in four categories: training support, research and resource project grants, and SBIR/STTR grants. In FY 2011, NLM made 143 grant awards using its base appropriation, of which 28 percent were new awards.

Informatics Research and Infrastructure for Biomedicine and Health: For more than 40 years, NLM has funded programs to develop the U.S. biomedical informatics infrastructure, including research on conceptual approaches and techniques for decision support, data mining, natural language understanding, and advanced statistical models. Many of today's informatics researchers and health information technology leaders are graduates of NLM-funded university-based informatics research training programs, which annually train 200 individuals at a select set of academic institutions across the country. In years past, NLM resource grants supported the first Internet connections for many health sciences libraries, hospitals, and web-based knowledge resources geared to the needs of consumers, clinicians, and scientists. NLM's Integrated Advanced Information Management Systems (IAIMS) grants were a precursor to NIH's popular Clinical and Translational Science Awards (CTSA) program, bringing organizations within an academic medical center together to plan for common information policies and shared resources. A unique NLM resource grant program supports scholars doing research in the history of medicine and biomedical science. NLM will fund 27 new research and SBIR/STTR projects in FY 2013, three new career transition awards, and up to 3 new awards for knowledge resource or scholarly works projects.

Program Portrait: **Training Tomorrow's Informatics and Health Information Technology Leaders**

FY 2012 Level: $9.6 million
FY 2013 Level: $11.1 million
Change: +$1.5 million

For decades, NLM's Extramural Programs Division has been the principal source of NIH support for research in basic and applied biomedical informatics. Such research encompasses areas ranging from the de-identification of patient data and protection of confidential health information to novel statistical and computational approaches for analyzing multi-dimensional research data. It also includes automated mining of electronic health records (EHR) for evidence of adverse drug interactions, the use of aggregated data from individual patients for clinical trials on rare diseases, and real-time graphical visualization of data about global health and epidemics.

Informatics for Integrating Biology and the Bedside (I2B2), which is a National Center for Biomedical Computing project funded jointly by the NIH Common Fund and NLM, is developing informatics techniques to support virtual cohort studies using data extracted from EHRs. In addition to computational innovation, this project has established models for data sharing, shared governance of software, and other policy areas that are vital to translational science and new models of clinical research. I2B2 hosts an annual international text mining challenge that is advancing the science of natural language understanding as applied to clinical narratives and notes.

NLM supports several different types of research grants, including SBIR/STTR grants, starter grants to new researchers making the transition to their first research positions, and a special research center. Extramural research investment areas include basic biomedical computational/information sciences, translational bioinformatics, health care and public health informatics, and consumer health informatics. Building on the base of more than 85 active research grants to non-profits and small businesses, NLM expects to award 27 new research and SBIR grants in FY 2013, three new transitional research awards to new scientists, and provide full support for its NCBCcenter.

Budget Policy: The FY 2013 President's Budget request includes $20.064 million, an increase of $0.806 million, or 4.2 percent, over the FY 2012 Enacted level of $19.258 million. This

program builds the informatics expertise and information resources needed to support biomedical scientists, health care providers, public health administrators, and health services researchers. In FY 2013, NLM will continue extramural support for its research grants and core resource and career transition programs, and for its highly regarded university-based training program.

Informatics Research: NLM informatics research grants have supported pioneering research and development in computational intelligence in medicine, clinical decision support, protection of privacy in electronic medical records, secondary use of routine clinical data for research purposes, regional health data integration, health applications of advanced telecommunications networks, automated bio-surveillance, and information management in disasters. These programs advance the science of biomedical informatics, which is the intersection of computer, information and engineering sciences with medicine, public health, and biological/behavioral sciences. Biomedical informatics research is fundamental to the sophisticated systems in which data from biological research and health care are stored, managed, and displayed. In recent years, NLM-funded researchers have demonstrated cost savings and other efficiencies related to their informatics research. As noted above, one research group showed how using natural language processing for phenotyping could reduce costs by magnitude factor of 100 as compared to conventional methods for clinical or research databases. Another developed a technique for running gene-gene interaction searches that was an order of magnitude faster and 25 times cheaper than current methods. NLM grant programs support both basic and applied research ranging from major research collaborations to small business innovation research. Investigator-initiated projects are funded as are projects from focused requests in target areas important to NLM's mission. In FY 2011, NLM issued 28 new research awards to organizations, including small businesses. Among the newly funded research awards made with appropriated funds are projects on scanning electronic health records for gene-disease associations, intelligent display of health data, delivering geospatial intelligence to clinicians, secure sharing of clinical history and genetic data, speech-therapy robotics, and new statistical methods for disease prediction and for network analysis of cell signaling.

Budget Policy: The FY 2013 President's Budget request is $31.401 million, an increase of $0.430 million, or 1.4 percent, from the FY 2012 Enacted level of $30.971 million. Informatics research is fundamental to the sophisticated systems in which research and health data are stored, managed, and displayed. NLM plans to continue to strengthen its RPG portfolio by issuing an RFA in an advanced informatics focus area such as natural language understanding or intelligent systems that support health decisions and by participating in selected multi-IC initiatives on topics of interest to NLM, such as health literacy, genome and the environment, and pharmacovigilance. NLM will continue to accept investigator-initiated grants through NIH parent-grant announcements as well as applications submitted to its own funding announcements. In FY 2013, NLM will support early stage and new investigators on RPG awards at success rates comparable to those of established investigators submitting new RPG applications.

RESEARCH MANAGEMENT AND SUPPORT

Research Management and Support (RMS) activities provide administrative, budgetary, logistical, and scientific support for basic library services, intramural research programs, and the review, award, and monitoring of research grants and training awards. RMS functions also include strategic planning, coordination, and evaluation of NLM's programs, regulatory compliance, policy development, international coordination and liaison with other Federal agencies, Congress, and the public. Included within this activity are: the Director and his immediate staff, the Office of Extramural Programs, the Office of Administrative Management, the Office of Health Information Programs Development, and the Office of Communications and Public Liaison.

Budget Policy: The FY 2013 President's Budget request is $14.255 million, the same as the FY 2012 Enacted level. The focus of RMS will continue to be the coordination of NLM's activities and policies and the development and administration of NLM's grant activities.

NATIONAL INSTITUTES OF HEALTH
National Library of Medicine

Budget Authority by Object
(Dollars in Thousands)

	FY 2012 Enacted	FY 2013 PB	Increase or Decrease
Total compensable workyears:			
Full-time employment	804	796	(8)
Full-time equivalent of overtime and holiday hours	3	3	0
Average ES salary (*in dollars*)	$168	$168	$0
Average GM/GS grade	11.1	11.1	0.0
Average GM/GS salary (*in dollars)*	$87	$87	$0
Average salary, grade established by act of July 1, 1944 (42 U.S.C. 207) *(in dollars)*	$85	$85	$0
Average salary of ungraded positions (*in dollars*)	126	126	0

	OBJECT CLASSES	FY 2012 Enacted	FY 2013 PB	Increase or Decrease
	Personnel Compensation:			
11.1	Full-time permanent	$43,776	$43,438	($338)
11.3	Other than full-time permanent	31,674	31,586	(88)
11.5	Other personnel compensation	1,865	1,863	(2)
11.7	Military personnel	84	85	1
11.8	Special personnel services payments	1,827	1,821	(6)
	Total, Personnel Compensation	**$79,226**	**$78,793**	**($433)**
12.0	Personnel benefits	$21,513	$21,394	($119)
12.2	Military personnel benefits	37	37	0
13.0	Benefits for former personnel	0	0	0
	Subtotal, Pay Costs	**$100,776**	**$100,224**	**($552)**
21.0	Travel and transportation of persons	$1,275	$1,135	($140)
22.0	Transportation of things	180	180	0
23.1	Rental payments to GSA	0	0	0
23.2	Rental payments to others	202	202	0
23.3	Communications, utilities and miscellaneous charges	1,134	1,134	0
24.0	Printing and reproduction	619	619	0
25.1	Consulting services	59,462	59,462	0
25.2	Other services	46,682	51,377	4,695
25.3	Purchase of goods and services from government accounts	67,087	72,838	5,751
25.4	Operation and maintenance of facilities	5,542	5,542	0
25.5	Research and development contracts	5,817	2,438	(3,379)
25.6	Medical care	0	0	0
25.7	Operation and maintenance of equipment	11,760	11,760	0
25.8	Subsistence and support of persons	0	0	0
25.0	**Subtotal, Other Contractual Services**	**$196,350**	**$203,417**	**$7,067**
26.0	Supplies and materials	$1,307	$1,307	$0
31.0	Equipment	19,115	19,115	0
32.0	Land and structures	0	0	0
33.0	Investments and loans	0	0	0
41.0	Grants, subsidies and contributions	44,084	45,317	1,233
42.0	Insurance claims and indemnities	0	0	0
43.0	Interest and dividends	1	1	0
44.0	Refunds	0	0	0
	Subtotal, Non-Pay Costs	**$264,267**	**$272,427**	**$8,160**
	Total Budget Authority by Object	**$365,043**	**$372,651**	**$7,608**

Includes FTEs which are reimbursed from the NIH Common Fund.

NATIONAL INSTITUTES OF HEALTH
National Library of Medicine

Salaries and Expenses
(Dollars in Thousands)

OBJECT CLASSES	FY 2012 Enacted	FY 2013 PB	Increase or Decrease
Personnel Compensation:			
Full-time permanent (11.1)	$43,776	$43,438	($338)
Other than full-time permanent (11.3)	31,674	31,586	(88)
Other personnel compensation (11.5)	1,865	1,863	(2)
Military personnel (11.7)	84	85	1
Special personnel services payments (11.8)	1,827	1,821	(6)
Total Personnel Compensation (11.9)	**$79,226**	**$78,793**	**($433)**
Civilian personnel benefits (12.1)	$21,513	$21,394	($119)
Military personnel benefits (12.2)	37	37	0
Benefits to former personnel (13.0)	0	0	0
Subtotal, Pay Costs	**$100,776**	**$100,224**	**($552)**
Travel (21.0)	$1,275	$1,135	($140)
Transportation of things (22.0)	180	180	0
Rental payments to others (23.2)	202	202	0
Communications, utilities and miscellaneous charges (23.3)	1,134	1,134	0
Printing and reproduction (24.0)	619	619	0
Other Contractual Services:			
Advisory and assistance services (25.1)	59,462	59,462	0
Other services (25.2)	46,682	51,377	4,695
Purchases from government accounts (25.3)	54,812	57,181	2,369
Operation and maintenance of facilities (25.4)	5,542	5,542	0
Operation and maintenance of equipment (25.7)	11,760	11,760	0
Subsistence and support of persons (25.8)	0	0	0
Subtotal Other Contractual Services	**$178,258**	**$185,322**	**$7,064**
Supplies and materials (26.0)	$1,307	$1,307	$0
Subtotal, Non-Pay Costs	$182,975	$189,899	$6,924
Total, Administrative Costs	**$283,751**	**$290,123**	**$6,372**

NATIONAL INSTITUTES OF HEALTH

National Library of Medicine

Details of Full-Time Equivalent Employment (FTEs)

OFFICE/DIVISION	FY 2011 Actual			FY 2012 Enacted			FY 2013 PB		
	Civilian	Military	Total	Civilian	Military	Total	Civilian	Military	Total
Division of Library Operations									
Direct:	320	0	320	320	0	320	318	0	318
Reimbursable:	0	0	0	0	0	0	0	0	0
Total:	320	0	320	320	0	320	318	0	318
Lister Hill National Center for Biomedical Communications									
Direct:	66	0	66	66	0	66	64	0	64
Reimbursable:	0	0	0	0	0	0	0	0	0
Total:	66	0	66	66	0	66	64	0	64
National Center for Biotechnology Information									
Direct:	162	1	163	162	1	163	160	1	161
Reimbursable:	114	0	114	114	0	114	114	0	114
Total:	276	1	277	276	1	277	274	1	275
Division of Specialized Information Services									
Direct:	42	0	42	42	0	42	40	0	40
Reimbursable:	0	0	0	0	0	0	0	0	0
Total:	42	0	42	42	0	42	40	0	40
Office of the Director/Administration									
Direct:	83	0	83	83	0	83	83	0	83
Reimbursable:	0	0	0	0	0	0	0	0	0
Total:	83	0	83	83	0	83	83	0	83
Division of Extramural Programs									
Direct:	16	0	16	16	0	16	16	0	16
Reimbursable:	0	0	0	0	0	0	0	0	0
Total:	16	0	16	16	0	16	16	0	16
Total	803	1	804	803	1	804	795	1	796
Includes FTEs which are reimbursed from 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
2009	10.9
2010	11.1
2011	11.1
2012	11.1
2013	11.1

NATIONAL INSTITUTES OF HEALTH
National Library of Medicine

Detail of Positions

GRADE	FY 2011 Actual	FY 2012 Enacted	FY 2013 PB
Total, ES Positions	5	5	5
Total, ES Salary	841	841	841
GM/GS-15	33	33	33
GM/GS-14	43	43	43
GM/GS-13	138	138	134
GS-12	140	140	136
GS-11	40	40	40
GS-10	0	0	0
GS-9	26	26	26
GS-8	57	57	57
GS-7	18	18	18
GS-6	2	2	2
GS-5	5	5	5
GS-4	21	21	21
GS-3	10	10	10
GS-2	6	6	6
GS-1	5	5	5
Subtotal	544	544	536
Grades established by Act of July 1, 1944 (42 U.S.C. 207):			
Assistant Surgeon General	0	0	0
Director Grade	0	0	0
Senior Grade	0	0	0
Full Grade	1	1	1
Senior Assistant Grade	0	0	0
Assistant Grade	0	0	0
Subtotal	1	1	1
Ungraded	283	283	283
Total permanent positions	510	510	502
Total positions, end of year	833	833	825
Total full-time equivalent (FTE) employment, end of year	804	804	796
Average ES salary	168	168	168
Average GM/GS grade	11.1	11.1	11.1
Average GM/GS salary	87	87	87

Includes FTEs which are reimbursed from the NIH Common Fund.