DEPARTMENT OF HEALTH AND HUMAN SERVICES

NATIONAL INSTITUTES OF HEALTH
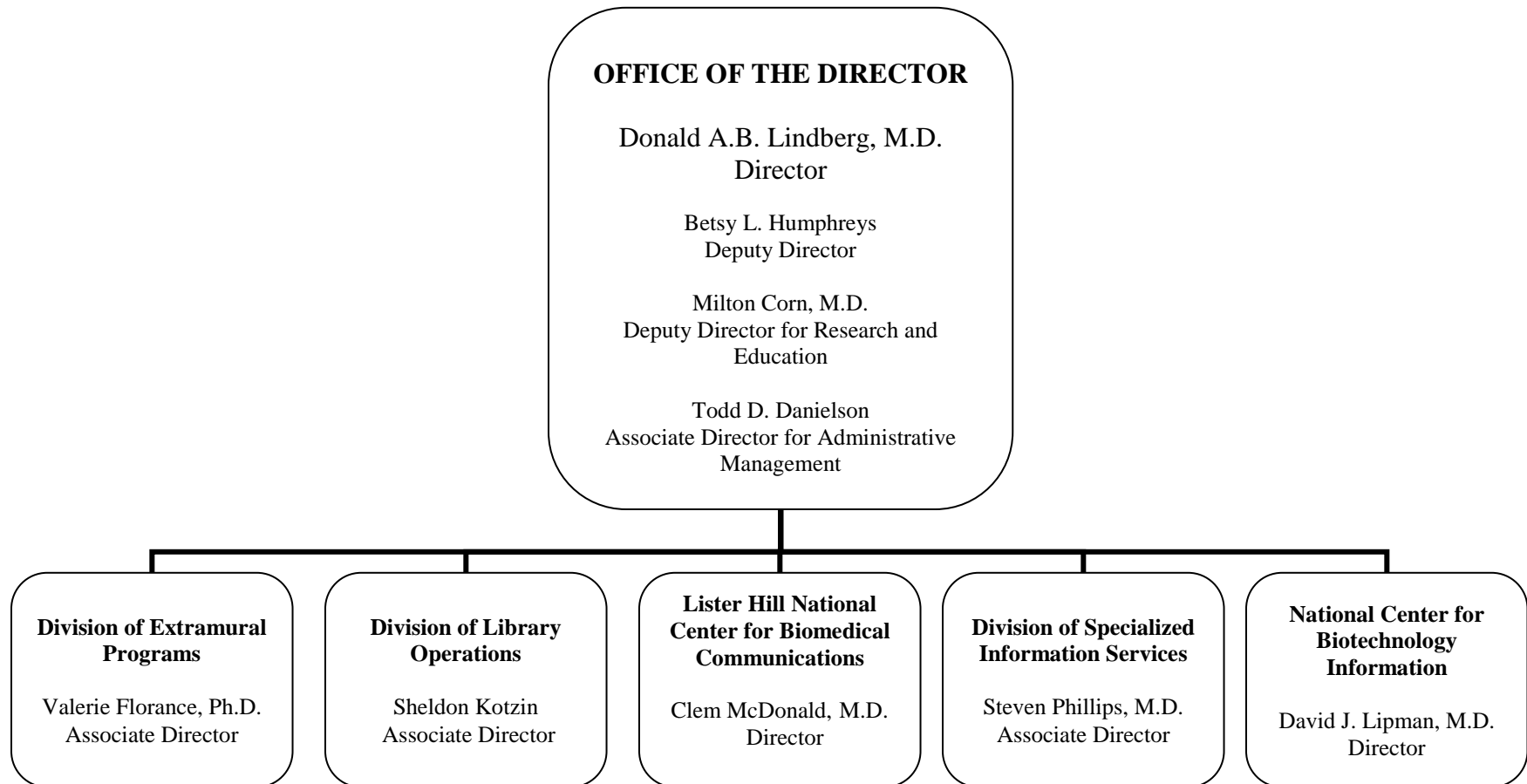
National Library of Medicine (NLM)

NATIONAL INSTITUTES OF HEALTH

NATIONAL LIBRARY OF MEDICINE

ORGANIZATION STRUCTURE

OFFICE OF THE DIRECTOR

Donald A.B. Lindberg, M.D.
Director

Betsy L. Humphreys
Deputy Director

Milton Corn, M.D.
Deputy Director for Research and
Education

Todd D. Danielson
Associate Director for Administrative
Management

Division of Extramural Programs

Valerie Florance, Ph.D.
Associate Director

Division of Library Operations

Sheldon Kotzin
Associate Director

Lister Hill National Center for Biomedical Communications

Clem McDonald, M.D.
Director

Division of Specialized Information Services

Steven Phillips, M.D.
Associate Director

National Center for Biotechnology Information

David J. Lipman, M.D.
Director

NATIONAL INSTITUTES OF HEALTH

National Library of Medicine

For carrying out section 301 and title IV of the Public Health Service Act ("PHS Act") with respect to health information communications, $387,153,000, of which $4,000,000 shall be available until expended for improvement of information systems: Provided, that in fiscal year 2012, 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: 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.

NATIONAL INSTITUTES OF HEALTH
National Library of Medicine

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

Source of Funding	FY 2010 Actual	FY 2011 CR	FY 2012 PB
Appropriation	339,716	339,716	387,153
Type 1 Diabetes	0	0	0
Rescission	0	0	0
Supplemental	0	0	0
Subtotal, adjusted appropriation	339,716	339,716	387,153
Real transfer under Director's one-percent transfer authority (GEI)	720	0	0
Real transfer under Secretary's one-percent transfer authority	(50)	0	0
Comparative Transfers to NLM for NCBI and Public Access	11,357	26,000	0
Comparative transfer under Director's one-percent transfer authority (GEI)	(720)	0	0
Comparative transfer under Secretary's one-percent transfer authority	0	0	0
Subtotal, adjusted budget authority	351,023	365,716	387,153
Unobligated balance, start of year	0	0	0
Unobligated balance, end of year	0	0	0
Subtotal, adjusted budget authority	351,023	365,716	387,153
Unobligated balance lapsing	(119)	0	0
Total obligations	350,904	365,716	387,153

[1] Excludes the following amounts for reimbursable activities carried out by this account:

    FY 2010 - $34,326   FY 2011 - $40,000   FY 2012 - $40,000

    Excludes $8,500.00 in FY 2010, $850.00 in FY 2011 and $0.00 in FY 2012 for royalties.

NATIONAL INSTITUTES OF HEALTH
National Library of Medicine
Budget Mechanism - Total [1]
(Dollars in Thousands)

MECHANISM	FY 2010 Actual		FY 2011 CR		FY 2012 PB		Change vs. FY 2010	
	No.	Amount	No.	Amount	No.	Amount	No.	Amount
Research Grants								
Research Projects								
Noncompeting	55	$19,494	57	$18,586	74	$24,662	19	$5,168
Administrative Supplements	*(2)*	2	*0*	*0*	*0*	*0*	2	(2)
Competing:								
Renewal	1	393	0	0	0	0	(1)	(393)
New	23	8,208	28	9,483	23	8,249	0	41
Supplements	0	0	0	0	0	0	0	0
Subtotal, Competing	24	$8,601	28	$9,483	23	$8,249	(1)	($352)
Subtotal, RPGs	79	$28,097	85	$28,069	97	$32,911	18	$4,814
SBIR/STTR	7	$832	8	$800	8	$800	1	($32)
Research Project Grants	86	$28,929	93	$28,869	105	$33,711	19	$4,782
Research Centers								
Specialized/Comprehensive	0	$0	0	$0	0	$0	0	$0
Clinical Research	0	0	0	0	0	0	0	0
Biotechnology	0	0	0	0	0	0	0	0
Comparative Medicine	0	0	0	0	0	0	0	0
Research Centers in Minority Institutions	0	0	0	0	0	0	0	0
Research Centers	0	$0	0	$0	0	$0	0	$0
Other Research								
Research Careers	4	$393	8	$1,039	6	$860	2	$467
Cancer Education	0	0	0	0	0	0	0	0
Cooperative Clinical Research	0	0	0	0	0	0	0	0
Biomedical Research Support	5	3,098	4	2,099	2	1,351	(3)	(1,747)
Minority Biomedical Research Support	0	0	0	0	0	0	0	0
Other	70	17,155	70	12,074	32	14,335	(38)	(2,820)
Other Research	79	$20,646	82	$15,212	40	$16,546	(39)	($4,100)
Total Research Grants	165	$49,575	175	$44,081	145	$50,257	(20)	$682
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	15	$17,089	10	$18,422	10	$22,603	(5)	$5,514
(SBIR/STTR)	*0*	*$0*	*0*	*$0*	*0*	*$0*	*0*	*$0*
	FTEs		FTEs		FTEs		FTEs	
Intramural Programs	701	$270,310	703	$288,958	703	$299,895	2	$29,585
Research Management and Support	99	14,049	101	14,255	101	14,398	2	349
Construction		0		0		0		0
Buildings and Facilities		0		0		0		0
Total, NLM	800	$351,023	804	$365,716	804	$387,153	4	$36,130

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

Major Changes in the Fiscal Year 2012 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 2012 budget request for NLM, which is $36.130 million over the FY 2010 level, for a total of $387.153 million.

Intramural Programs (+$29.585 million; total $299.895 million): 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. An increase in FTE is requested to allow NLM's Intramural Programs to continue and build upon the processing of data and provision of services to the Library's national collection of biomedical information and electronic databases. Additional funds have been specifically added to 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 NIH-funded high-throughput genomic sequencing initiatives.

Research Project Grants (+$4.782 million; total $33.711 million): NLM will support a total of 105 Research Project Grant (RPG) awards in FY 2012. Noncompeting RPGs will increase by 19 awards and increase $5.168 million. The NIH Budget policy for RPGs in FY 2012 is to provide a 1% inflationary increase in noncompeting awards.

NATIONAL INSTITUTES OF HEALTH
National Library of Medicine
Summary of Changes

(Dollars in Thousands)

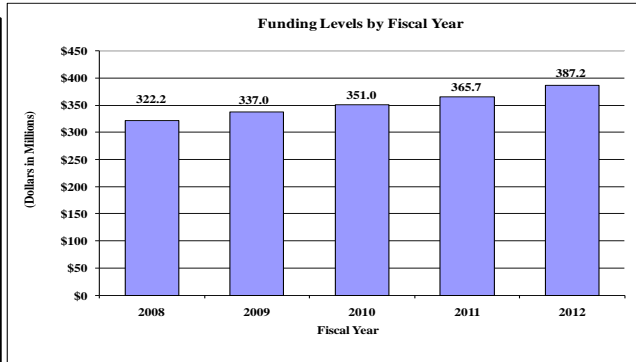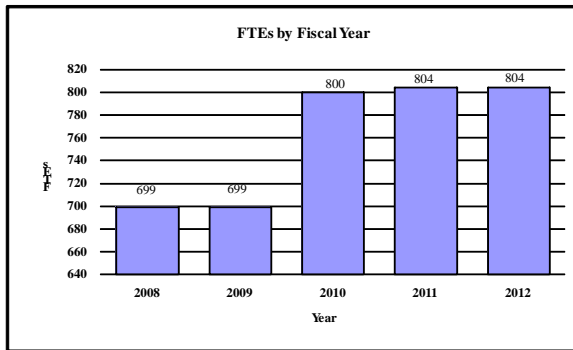|				
FY 2010 Actual				**$351,023**
FY 2012 Estimate				**387,153**
Net change				**$36,130**
		2012	**Change from FY 2010**	
		Estimate		
		Budget		**Budget**
CHANGES	**FTEs**	**Authority**	**FTEs**	**Authority**
A. Built-in:				
1. Intramural Programs:				
a. Annualization of January				
2010 pay increase		$89,882		$544
b. January FY 2012 pay increase		89,882		0
c. One less day of pay (n/a for 2011)		89,882		(347)
d. Payment for centrally furnished services		8,547		85
e. Increased cost of laboratory supplies,				
materials, and other expenses		201,466		1,903
Subtotal		$479,659		$2,185
2. Research Management and Support:				
a. Annualization of January				
2010 pay increase		$8,138		$48
b. January FY 2012 pay increase		8,138		0
c. One less day of pay (n/a for 2011)		8,138		(31)
d. Payment for centrally furnished services		0		0
e. Increased cost of laboratory supplies,				
materials, and other expenses		6,260		61
Subtotal		$30,674		$78
Subtotal, Built-in		$510,333		$2,263

NATIONAL INSTITUTES OF HEALTH
National Library of Medicine

Summary of Changes--continued

CHANGES	2012 Estimate		Change from FY 2010	
	No.	Amount	No.	Amount
B. Program:				
1. Research Project Grants:				
a. Noncompeting	74	$24,662	19	$5,166
b. Competing	23	8,249	(1)	(352)
c. SBIR/STTR	8	800	(16)	(32)
Total	105	$33,711	2	$4,782
2. Research Centers	0	$0	0	$0
3. Other Research	40	16,546	(39)	(4,100)
4. Research Training	0	0	0	0
5. Research and development contracts	10	22,603	(5)	5,514
Subtotal, Extramural		$72,860		$6,196
	FTEs		FTEs	
6. Intramural Programs	703	$299,895	2	$27,400
7. Research Management and Support	101	14,398	2	271
8. Construction		0		0
9. Buildings and Facilities		0		0
Subtotal, program		$387,153		$33,867
Total changes	804	$387,153	4	$36,130

Fiscal Year 2012 Budget Graphs

History of Budget Authority and FTEs:

FTEs by Fiscal Year

Year	FTEs
2008	699
2009	699
2010	800
2011	804
2012	804

Funding Levels by Fiscal Year (Dollars in Millions)

Fiscal Year	Dollars in Millions
2008	322.2
2009	337.0
2010	351.0
2011	365.7
2012	387.2

Distribution by Mechanism:

FY 2012 Budget Mechanism

- Intramural Programs 77%
- R&D Contracts 6%
- Other Research 4%
- Research Project Grants 9%
- RM&S 4%
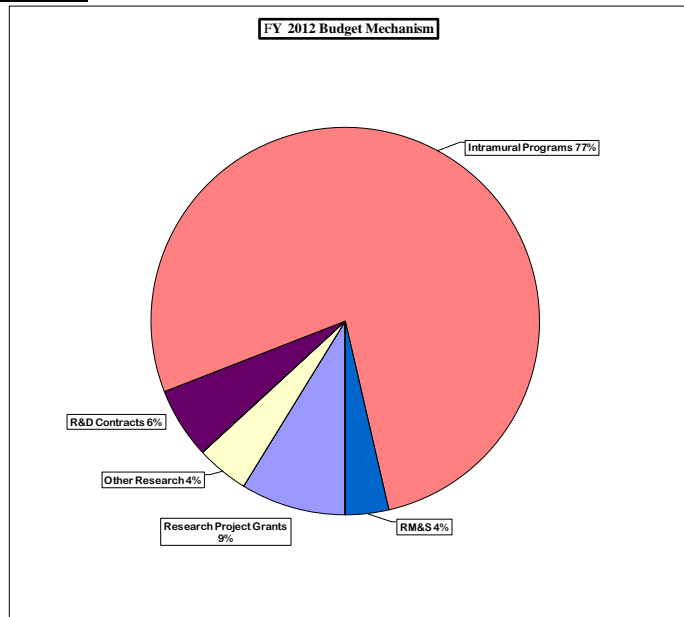
Change by Selected Mechanisms:

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FY 2012 Estimate Percent Change from FY 2010 Mechanism

Category	Percent Change
Research Project Grants	16.5%
Research Centers	0.0%
Other Research	-19.9%
Research Training	0.0%
R&D Contracts	32.3%
Intramural Programs	10.9%
Res. Mgmt. & Support	2.5%
B&F	0.0%

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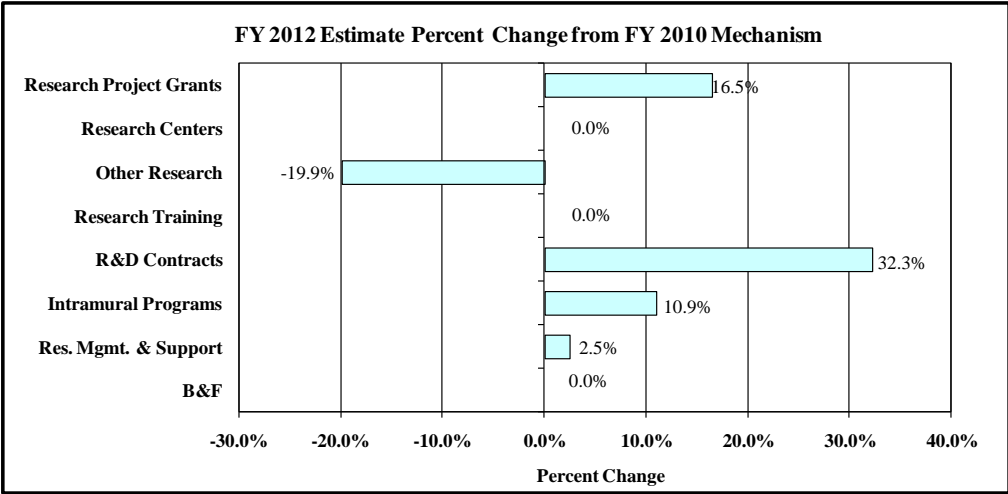
NATIONAL INSTITUTES OF HEALTH
National Library of Medicine
Budget Authority by Activity
(Dollars in thousands)

	FY 2010 Actual		FY 2011 CR		FY 2012 PB		Change vs. FY 2010	
Extramural Research	**FTEs**	**Amount**	**FTEs**	**Amount**	**FTEs**	**Amount**	**FTEs**	**Amount**
Detail:								
Health Information for Health Professionals and Public (NN/LM)		$11,586		$12,319		$12,319		$733
Informatics Infrastructure		21,055		15,412		16,746		-4,309
Informatics Research		34,023		34,772		43,795		9,772
Subtotal, Extramural		$66,664		$62,503		$72,860		$6,196
Intramural Programs	701	$270,310	703	$288,958	703	$299,895	2	$29,585
Research Management & Support	99	$14,049	101	$14,255	101	$14,398	2	$349
TOTAL	800	$351,023	804	$365,716	804	$387,153	4	$36,130

1. Includes FTEs which are reimbursed from the NIH Common Fund for Medical Research.
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	2011 Amount Authorized	FY 2010 Estimate	2012 Amount Authorized	FY 2012 PB
Research and Investigation	Section 301	42§241	Indefinite		Indefinite	
	Section 401(a)	42§281	Indefinite	$351,023,000	Indefinite	$387,153,000
National Library of Medicine						
Total, Budget Authority				$351,023,000		$387,153,000

NATIONAL INSTITUTES OF HEALTH
National Library of Medicine

Appropriations History

Fiscal Year	Budget Estimate to Congress	House Allowance	Senate Allowance	Appropriation
2003	$313,534,000	$313,534,000	$331,443,000	$302,099,000
Rescission				($1,964,000)
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	
Rescission				
2012	$387,153,000			

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 (BA):

	FY 2010 Actual	FY 2011 CR	FY 2012 Budget Request	FY 2012 +/- FY 2010
BA	$351,023,000	$365,716,000	$387,153,000	+$36,130,000
FTE	800	804	804	+4

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

Director's Overview

Celebrating its 175th anniversary this year, the National Library of Medicine (NLM) is the world's largest biomedical library and the producer of electronic information services used by millions of users around the globe to obtain trillions of bytes of data every day. Scientists, health professionals, and the public search the Library's resources more than two billion times each year. A pioneer and innovator in information technology, NLM plays a pivotal role in supporting the translation of basic science into new treatments, improved practice, and decision support for health professionals and patients. Today, the Library:

- Acquires, organizes, and works to preserve the world's scholarly biomedical literature and to address the challenges of making digital information permanent;
- Provides nationwide access to biomedical and health information in partnership with the 5,800-member National Network of Libraries of Medicine;
- Serves as a leading international resource for building, curating, and providing sophisticated access to molecular biology and genomic databases via its National Center for Biotechnology Information (NCBI);
- Creates high quality information services on toxicology, environmental health, health services research, public health, and disaster management;
- Aids national disaster management efforts by developing relevant information systems and resources, ensuring uninterrupted access to critical health information resources when disasters occur;
- Supports and conducts advanced research and development in biomedical informatics and health information technology;
- Develops and supports health data standards for electronic health records in coordination with Office of the National Coordinator for Health Information Technology (ONC) to enable efficient health information exchange and support health care reform; and
- Is the primary supporter of university-based research training in biomedical informatics.

NLM continues to focus on the goals of its 2006-2016 Long Range Plan, including key activities to support interoperable health information technology, development of a robust knowledge base

for personalized health care, advanced information access for accelerated discovery, more effective response to disasters and emergencies, reduction of health disparities, and improved health literacy.

Support of NIH Director's Key Initiatives

Initiative: Technologies to Accelerate Discovery

NLM's NCBI promotes scientific discovery by organizing and providing rapid access to the flood of genetic sequence data resulting from new high throughput sequencing technologies that allow complete genomes to be sequenced in days rather than years. Advanced computational tools provide the means for sophisticated analysis of complex molecular biology data to accelerate discovery of the genetic role in health and disease . NCBI's database of Genotypes and Phenotypes (dbGaP) links genomic and clinical data for the same patients to help identify genetic variations that may affect predisposition to disease or response to therapy.

Initiative: Re-engineering the Therapeutic Development Pipeline

NLM stands at the center of biomedical research: receiving, storing, disseminating, and connecting the biomedical literature - including articles deposited in PubMed Central in response to the NIH Public Access Policy - with biological, biochemical, genomic and clinical research data. Clinical trials play a critical role in translating research discoveries into effective treatments. With information on approximately 100,000 research studies in 174 countries, NLM's ClinicalTrials.gov is the most comprehensive source of information about clinical trials, serving researchers, health professionals, and the public. In accordance with provisions of the Food and Drug Administration (FDA) Amendments Act of 2007, ClinicalTrials.gov now accommodates summary results data. By the end of FY 2010, summary results information (including adverse event information) had been submitted for more than 2,500 completed trials. Results generally appear in ClinicalTrials.gov long before they are available anywhere else.

Initiative: Enhancing the Evidence Base for Health Care Decisions

NLM's services are a primary source of the results of comparative effective research, providing access to evidence on the best practices to improve patient safety and health care quality. NLM's program of Extramural grants supports informatics research to enhance electronic health records, to support integration and mining of large data sets from health care and basic biomedical research, and to organize and present evidence that helps health care providers, patients and consumers make sound health decisions. NLM's intramural research program on personal health records, building on more than two decades of NLM work on standard medical terminologies in the Unified Medical Language System, explores methods to help individuals use evidence to manage their own health, convey important information to their health care teams, and also generate standardized data that can speed scientific discovery. As the Department of Health and Human Services central coordinating body for clinical terminologies, NLM works closely with ONC to support and enhance standards to enable meaningful use of electronic health records as a means for improving health care quality and efficiency and generating better evidence as a by-product of health care.

Equally important, NLM provides accurate, understandable information to help patients and the public play an active role in managing their health. NLM's heavily used Web-based information services in English and Spanish are now available in a mobile-friendly format and are directly linkable to electronic health records via the new MedlinePlus Connect feature. The NIH MedlinePlus magazine, also in English and Spanish, makes the latest research findings available in lay language to those who may not have electronic access. Working with libraries and other partners across the country, NLM develops and tests new methods for increasing awareness and use of NIH information services, especially among populations with significant health disparities. NLM employs different kinds of social media such as Twitter and Facebook, mobile technology, specialized Web services, information prescriptions, and travelling exhibitions to ensure that everyone in the U.S. has a known, accessible and understandable source of high quality health information.

NLM's information services encompass the world's biomedical research output, including data on global infectious diseases. Because the Library uses the Internet and the World Wide Web as the primary means of delivering its information services and tools within the US, the Library's databases and tools are also readily accessible and heavily used by researchers, health professionals, and members of the public in virtually every country in the world.   Innovative partnerships and applications of mobile technologies developed and tested by NLM to aid disaster response in the US have been quickly adapted and deployed in international situations, including earthquakes in Haiti and Chile, floods in Pakistan, and community research in Uganda.

Initiative: New Investigators, New Ideas

NLM is the principal supporter of training for informatics research careers at 18 universities across the country. The Library 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, and use of high-school peer tutors in health information outreach projects.

Overall Budget Policy: The FY 2012 request for NLM is $387.153 million, an increase of $36.130 million or 10.3 percent over the FY 2010 Enacted Level. 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 77 percent of the NLM budget. Funds are allocated to cover most of the inflationary increases associated with NLM services and processing some of the deluge of data from high throughput technologies. Funds for extramural grants remain relatively level in FY 2012 and the Library will continue to support the National Network of Libraries of Medicine and its role in improving US-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 reflect NLM's share of NIH-wide funding required to support several trans-NIH initiatives, such as the Therapies for Rare and Neglected Diseases program (TRND) and the Basic Behavioral and Social Sciences Opportunity Network (OppNet).

INTRAMURAL PROGRAMS

NLM's intramural programs acquire, organize, preserve, and provide access to the world's biomedical literature. 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 researchers, health professionals, patients and the general public.

Delivering Reliable, High Quality Biomedical and Health Information Services: At the core of the National Library of Medicine (NLM) are the world's largest, continually expanding collection of biomedical literature and a broad array of authoritative databases for health professionals, researchers, 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 2010, NLM greatly expanded the quantity and range of high quality information readily available to researchers, health professionals, and the general public. Major advances included: enhancements to the Sequence Read Archive, which enables researchers to access and compute on the enormous quantities of data coming from genomic studies which employ next-generation sequencing platforms; a significant increase in the number of full text articles in PubMed Central, which now provides public access to more than 2 million research articles, including those produced by NIH-funded researchers; new sources of information and search tools to improve access to the results of comparative 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 these resources.

Budget Policy: The FY 2012 Budget request is $121.202 million, an increase of $2.377 million or 2.0 percent from the FY 2010 level of $118.825 million. In FY 2012, the Library will concentrate on maintaining its current level of services and enhancing and expanding some of 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 2012. NLM will support the expansion of ClinicalTrials.gov in FY 2012 to accommodate increasing submissions of summary results in accordance with the Food and Drug Administration Amendments Act of 2007.

Promoting Public Awareness and Access to Information: The NLM has extensive outreach programs to make biomedical researchers, health professionals, librarians, patients, and the public aware of NLM's diverse information services. NLM makes heavy use of the National Network of Libraries of Medicine and other formal partnerships, including the 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, to improve access to high quality health information. 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. As part of its outreach efforts, NLM continually solicits feedback from users on how existing resources can be improved. In FY 2010, 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. This past year, the NLM and the NIH partnered with the National Hispanic Medical Association, the American Diabetes Association, the Peripheral Arterial Disease (P.A.D.) Coalition, among others, to extend the distribution of the magazine to the audiences they serve. The magazine 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. Depending on the issue, between 300,000 to 600,000 copies of each quarterly magazine currently reach a readership of over 5 million Americans. NLM expanded its successful traveling exhibitions program as another means of highlighting the Library's collections and services and promoting interest in careers in science and medicine in public libraries and other venues across the country. Two recent additions include: *Harry Potter's World: Renaissance Science, Magic, and Medicine*, already fully booked through 2012 and *Binding Wounds, Pushing Boundaries: African Americans in Civil War Medicine.*

Budget Policy: The FY 2012 Budget request is $5.123 million, an increase of $0.051 million or 1.0 percent from the FY 2010 level of $5.072 million. In FY 2012, NLM will continue its outreach programs with a special emphasis on those aimed at underserved and minority populations. As recommended by the 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 development (R&D) programs. The Library has two organizations that conduct advanced R&D on different aspects of biomedical communication—the Lister Hill National Center for Biomedical Communications (LHC) and the National Center for Biotechnology Information (NCBI). The 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. The NCBI, created in 1988, conducts research and development 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. In FY 2010, imaging tools developed by NLM's LHC became integral to training and testing proficiency in colposcopy in medical schools and residency programs across the country. LHC also made advances that will facilitate health information exchange and meaningful use of EHRs in addition to continuing ground-breaking research in natural language processing and medical image processing. 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. NLM's NCBI continued to expand its resource of over 40 integrated biomedical databases that supports 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 associated NCBI databases, such dbGaP, PubChem, and numerous other protein and gene databases, all 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.

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

FY 2010 Level: $97.914 million
FY 2012 Level: $116.234 million
Change: +$18.323 million

With the dramatic developments in next generation sequencing technologies there is now a unique opportunity to apply genomics to a better understanding of basic biological processes and to discovering the causes of specific diseases. New sequencing, microarray, and small molecule screening technologies are resulting in exponential increases in the genomic data analyzed, stored and distributed at NCBI. This explosive growth in sequencing data is expected to continue as sequencing gets less expensive, a greater proportion of research focuses on genomics, and as additional resources become available for the support of new genetic research. NCBI's role in organizing, analyzing and making this voluminous data accessible represents a critical link in the discovery chain that detects important new associations between genes and then translates that information into better diagnoses and treatments. NCBI bridges the basic research and medical communities by organizing and integrating genomics data for developing new diagnostic and therapeutic strategies. An example of the type of NCBI information resource that integrates genetic information for health practitioners is the planned NIH's Genetic Testing Registry, which will offer a central location for genetic testing laboratories to submit test information voluntarily. Users will be able to find comprehensive listings of tests quickly as well as information about a test's scientific basis.

With over a million users a day accessing NCBI's databases and downloading over 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.

Budget Policy: The FY 2012 Budget request is $173.570 million, an increase of $27.157 million or 18.5 percent from the FY 2010 level of $146.413 million. The majority of the additional funds will be used by NCBI and replaces the amount of funding that must be 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 the 2006-2016 Long Range Plan, NLM's research divisions will engage in critical research and development 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 US-wide use key clinical vocabularies, including SNOMED CT®; and to develop and test tools and subsets to promote meaningful use of electronic health records.

EXTRAMURAL PROGRAMS

NLM's Extramural programs focus on three priority areas: (1) the creation and enhancement of information infrastructure and knowledge resources for biomedicine; (2) biomedical informatics research to develop and test sophisticated computational approaches for acquiring, integrating, managing, mining and presenting biomedical data, information and knowledge; and (3) training for research careers in biomedical informatics. To accomplish its extramural goals in 2012, NLM will offer grants in five categories: training support; career transition awards; research project grants; resource grants; and SBIR/STTR grants. In FY 2010, NLM made 170 grant awards, of which 25% were new awards, using its base appropriation. In addition, NLM made 18 new grants and 18 new supplements to existing grants in FY 2010 using funds from the American Recovery and Reinvestment Act (ARRA).

Informatics Infrastructure for Biomedicine and Health: For more than 40 years the NLM has funded programs to develop the U.S. biomedical informatics infrastructure, including the informatics research workforce, advanced telecommunications capabilities, and cutting edge information resources. Many of today's Health IT leaders are graduates of NLM-funded university-based informatics research training programs, which annually trains 200 people at 18 institutions across the country. In years past, NLM grants supported the first Internet connections for many health sciences libraries, hospitals, local public health departments, and community organizations. In FY 2010, NLM funding supported 120 predoctoral and 80 postdoctoral informatics trainees. Three new career transition awards are planned in FY 2012, along with five new awards for knowledge management or scholarly works.

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

FY 2010 Level: $12.946 million
FY 2012 Level: $11.143 million
Change: +$1.803 million

For more than 30 years, NLM's Extramural Programs Division has been the principal source of NIH support for research training in biomedical informatics, which encompasses research areas from the application of high throughput sequencing technologies to individual patient genomes to the enhancement of electronic health records (EHR) to the use of aggregated data from individual patients for population health. Developing a cadre of cross-trained researchers is especially important as rapid advancement of health care and biomedical research requires investigators who understand biomedicine as well as fundamental problems of knowledge representation, decision support, translational research, human-computer interface, and social and organizational factors that influence effective adoption of health information technology.

NLM supports eighteen five-year institutional training grants for biomedical informatics across the US, which in recent years has supported approximately 200 pre-doctoral and post-doctoral trainees each year. Other NIH institutes often provided funds to support additional trainees in these programs. NLM plans to provide summer research experiences for up to five high school or college students to work on research with faculty at NLM-funded training programs.

Budget Policy: The FY 2012 Budget request includes $16.746 million, a $4.309 million decrease compared to the FY 2010 appropriation of $21.055 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 2012, NLM will continue extramural support for its research grants, 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 and information sciences with medicine, public health, and biological/behavioral sciences. Biomedical informatics research is fundamental to the sophisticated systems in which biological research and health data are stored, managed, and displayed. For example, NLM-funded research provided the foundation for the Microsoft Health Vault and Google Health personally controlled health record systems. NLM grant programs support both basic and applied research; both large and small projects, ranging from major research resources to small business innovation research; and investigator-initiated projects as well as focused requests for applications in target areas important to NLM's mission. These grant programs also include funds for small business innovation research (SBIR/STTR) grants in informatics areas. In FY 2010, NLM issued 30 new research awards to organizations, including small businesses. NLM also awarded 18 new research grants and made supplements to 18 existing research grants projects using ARRA funds. Among the newly funded research awards made with appropriated funds are projects on modeling the global impact of climate change on infectious disease, teaching neurology using virtual patients, discovering temporal relations in clinical notes, and improving access to multi-lingual health information through machine translation. Other new research awards funded with ARRA funds aim to explore the use of virtual reality in managing diabetes, assess the impact of an 'information prescription' on medication adherence, and build a chemical biology network for personalized medicine.

Budget Policy: The FY 2012 Budget request is $43.795 million, an increase of $9.772 million, or 28.7 percent, over the FY 2010 appropriation of $34.023 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 RFAs in advanced informatics focus areas such as computational data mining, natural language understanding, and intelligent personal health records, and by participating in multi-IC initiatives on topics of interest to NLM, such as health literacy, pharmacovigilance, and comparative effectiveness research. NLM will continue to accept investigator-initiated grants through NIH parent grant FOAs for R01 and R21. These grant programs also include funds for support small business innovation research (SBIR/STTR) grants in informatics areas. In FY 2012, NLM will support new investigators on R01 equivalent awards at success rates equivalent to those of established investigators submitting new R01 equivalent 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 2012 Budget request is $14.398 million, an increase of $0.349 million or 2.5 percent above the FY 2010 appropriation of $14.049 million. 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. NLM is a key participant in the NIH Roadmap's Molecular Libraries initiative through its development and distribution of the PubChem small-molecule database (ML2-1). This activity is supported in its entirety by the NIH Common Fund.

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Budget Authority by Object
(Dollars in Thousands)

	FY 2010 Actual	FY 2012 PB	Increase or Decrease	Percent Change
Total compensable workyears:				
Full-time employment	800	804	4	0.5%
Full-time equivalent of overtime and holiday hours	4	4	0	0.0%
Average ES salary	$169	$169	$0	0.0%
Average GM/GS grade	11.1	11.1	0.0	0.0%
Average GM/GS salary	$87	$87	$0	0.0%
Average salary, grade established by act of				
July 1, 1944 (42 U.S.C. 207)	$83	$85	$2	2.4%
Average salary of ungraded positions	125	125	0	0.0%

OBJECT CLASSES	FY 2010 Actual	FY 2012 Estimate	Increase or Decrease	Percent Change
Personnel Compensation:				
11.1 Full-time permanent	$43,448	$43,558	$110	0.3%
11.3 Other than full-time permanent	30,268	30,263	(5)	0.0%
11.5 Other personnel compensation	2,468	2,476	8	0.3%
11.7 Military personnel	82	87	5	6.1%
11.8 Special personnel services payments	2,145	2,144	(1)	-4.7%
Total, Personnel Compensation	**$78,411**	**$78,528**	**$117**	**0.1%**
12.0 Personnel benefits	$19,433	$19,456	$23	11.8%
12.2 Military personnel benefits	37	37	0	0.0%
13.0 Benefits for former personnel	0	0	0	0.0%
Subtotal, Pay Costs	**$97,881**	**$98,021**	**$140**	**14.3%**
21.0 Travel and transportation of persons	$1,386	$1,418	$32	2.3%
22.0 Transportation of things	146	149	3	2.1%
23.1 Rental payments to GSA	0	0	0	0.0%
23.2 Rental payments to others	102	104	2	2.0%
23.3 Communications, utilities and				
miscellaneous charges	1,092	1,118	26	2.4%
24.0 Printing and reproduction	477	488	11	2.3%
25.1 Consulting services	35,347	34,037	(1,310)	-3.7%
25.2 Other services	44,315	44,968	653	1.5%
25.3 Purchase of goods and services from				
government accounts	65,715	98,840	33,125	50.4%
25.4 Operation and maintenance of facilities	6,391	6,539	148	2.3%
25.5 Research and development contracts	10,586	12,319	1,733	16.4%
25.6 Medical care	213	218	5	2.3%
25.7 Operation and maintenance of equipment	13,276	13,585	309	2.3%
25.8 Subsistence and support of persons	0	0	0	0.0%
25.0 Subtotal, Other Contractual Services	**$175,843**	**$210,506**	**$34,663**	**19.7%**
26.0 Supplies and materials	$2,149	$2,200	$51	2.4%
31.0 Equipment	22,371	22,891	520	2.3%
32.0 Land and structures	0	0	0	0.0%
33.0 Investments and loans	0	0	0	0.0%
41.0 Grants, subsidies and contributions	49,575	50,257	682	1.4%
42.0 Insurance claims and indemnities	0	0	0	0.0%
43.0 Interest and dividends	1	1	0	0.0%
44.0 Refunds	0	0	0	0.0%
Subtotal, Non-Pay Costs	**$253,142**	**$289,132**	**$35,990**	**14.2%**
Total Budget Authority by Object	**$351,023**	**$387,153**	**$36,130**	**10.3%**

Includes FTEs which are reimbursed from the NIH Common Fund for Medical Research

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Salaries and Expenses
(Dollars in Thousands)

OBJECT CLASSES	FY 2010 Actual	FY 2012 PB	Increase or Decrease	Percent Change
Personnel Compensation:				
Full-time permanent (11.1)	$43,448	$43,558	$110	0.3%
Other than full-time permanent (11.3)	30,268	30,263	(5)	0.0%
Other personnel compensation (11.5)	2,468	2,476	8	0.3%
Military personnel (11.7)	82	87	5	6.1%
Special personnel services payments (11.8)	2,145	2,144	(1)	0.0%
Total Personnel Compensation (11.9)	**$78,411**	**$78,528**	**$117**	**0.1%**
Civilian personnel benefits (12.1)	$19,433	$19,456	$23	0.1%
Military personnel benefits (12.2)	37	37	0	0.0%
Benefits to former personnel (13.0)	0	0	0	0.0%
Subtotal, Pay Costs	**$97,881**	**$98,021**	**$140**	**0.1%**
Travel (21.0)	$1,386	$1,418	$32	2.3%
Transportation of things (22.0)	146	149	3	2.1%
Rental payments to others (23.2)	102	104	2	2.0%
Communications, utilities and miscellaneous charges (23.3)	1,092	1,118	26	2.4%
Printing and reproduction (24.0)	477	488	11	2.3%
Other Contractual Services:				
Advisory and assistance services (25.1)	35,347	34,037	(1,310)	-3.7%
Other services (25.2)	44,315	44,968	653	1.5%
Purchases from government accounts (25.3)	57,140	86,251	29,111	50.9%
Operation and maintenance of facilities (25.4)	6,391	6,539	148	2.3%
Operation and maintenance of equipment (25.7)	13,276	13,585	309	2.3%
Subsistence and support of persons (25.8)	0	0	0	0.0%
Subtotal Other Contractual Services	**$156,469**	**$185,380**	**$28,911**	**18.5%**
Supplies and materials (26.0)	$2,149	$2,200	$51	2.4%
Subtotal, Non-Pay Costs	**$161,821**	**$190,857**	**$29,036**	**17.9%**
Total, Administrative Costs	**$259,702**	**$288,878**	**$29,176**	**11.2%**

Details of Full-Time Equivalent Employment (FTEs)

OFFICE/DIVISION	FY 2010 Actual			FY 2011 CR			FY 2012 PB		
	Civilian	Military	Total	Civilian	Military	Total	Civilian	Military	Total
Division of Library Operations	335		335	336		336	336		336
Lister Hill National Center for Biomedical Communications	68		68	68		68	68		68
National Center for Biotechnology Information	255	1	256	258	1	259	258	1	259
Division of Specialized Information Services	42		42	42		42	42		42
Office of the Director/Administration	84		84	84		84	84		84
Division of Extramural Programs	15		15	15		15	15		15
			0			0			0
			0			0			0
			0			0			0
Total	799	1	800	803	1	804	803	1	804

Includes FTEs which are reimbursed from the NIH Common Fund for Medical Research

FTEs supported by funds from Cooperative Research and
Development Agreements   0   0   0

FISCAL YEAR	Average GS Grade
2008	10.9
2009	10.9
2010	11.1
2011	11.1
2012	11.1

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Detail of Positions

GRADE	FY 2010 Actual	FY 2011 CR	FY 2012 PB
Total, ES Positions	4	5	5
Total, ES Salary	676	845	845
GM/GS-15	33	33	33
GM/GS-14	46	46	46
GM/GS-13	132	134	134
GS-12	128	129	129
GS-11	45	45	45
GS-10	1	1	1
GS-9	34	34	34
GS-8	57	57	57
GS-7	27	27	27
GS-6	4	4	4
GS-5	3	3	3
GS-4	15	15	15
GS-3	8	8	8
GS-2	5	5	5
GS-1	3	3	3
Subtotal	541	544	544
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	276	276	276
Total permanent positions	519	534	534
Total positions, end of year	822	841	838
Total full-time equivalent (FTE) employment, end of year	800	804	804
Average ES salary	169	169	169
Average GM/GS grade	11.1	11.1	11.1
Average GM/GS salary	87	87	87

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New Positions Requested

		FY 2012	
	Grade	**Number**	**Annual Salary**
Associate Director	SES	1	$169
Technical Information Specialist	GS-13	2	89
Technical Information Specialist	GS-12	1	75
Total Requested		4	$333