

DEPARTMENT OF HEALTH AND HUMAN SERVICES

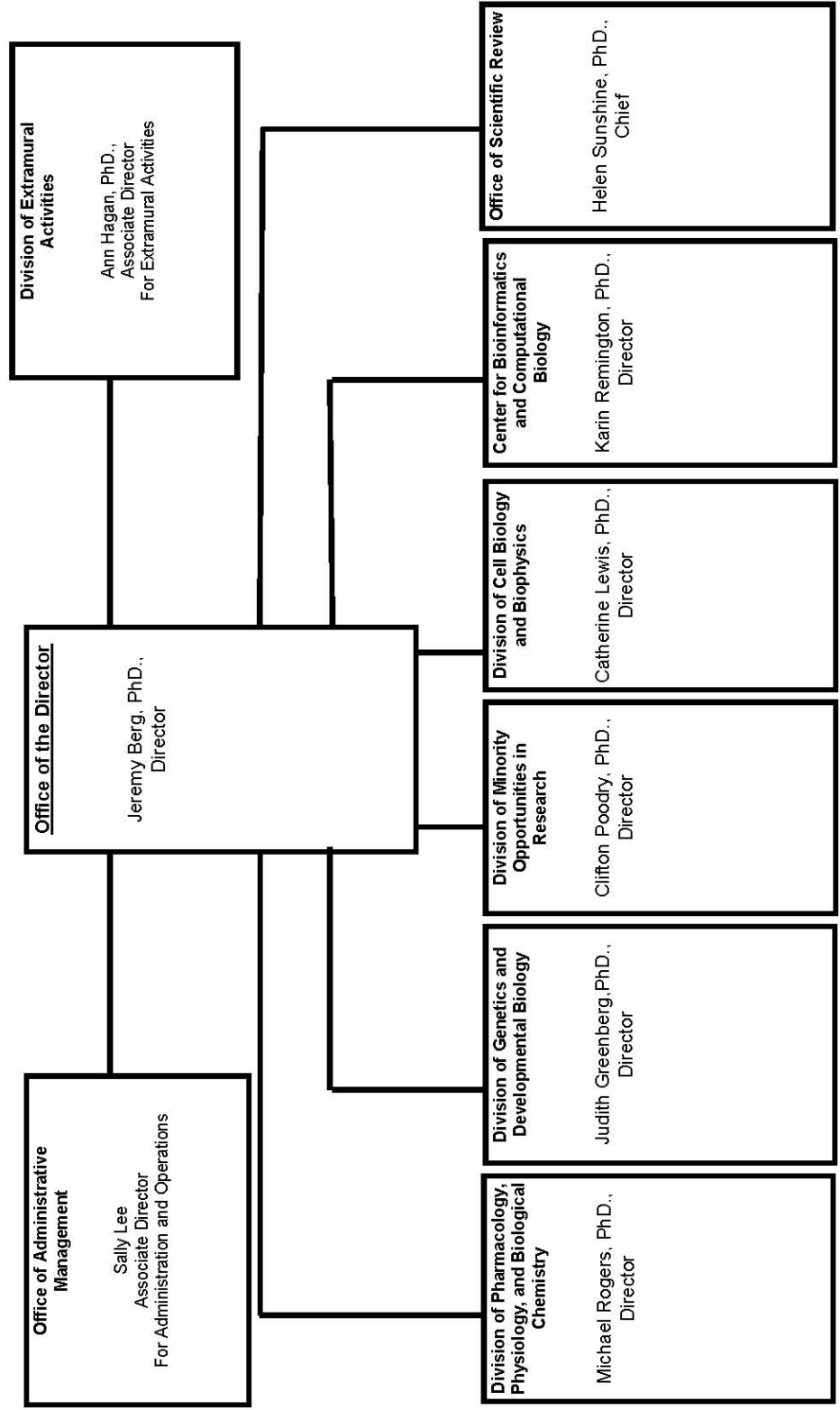
NATIONAL INSTITUTES OF HEALTH

National Institute of General Medical Sciences

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NATIONAL INSTITUTES OF HEALTH
National Institute of General Medical Sciences

Organization Structure



NATIONAL INSTITUTES OF HEALTH

National Institute of General Medical Sciences

For carrying out section 301 and title IV of the Public Health Services Act with respect to general medical sciences \$2,102,300,000.

NATIONAL INSTITUTES OF HEALTH
National Institute of General Medical Sciences

Amounts Available for Obligation ¹
(Dollars in Thousands)

Source of Funding	FY 2010 Actual	FY 2011 CR	FY 2012 PB
Appropriation	2,051,798	2,051,798	2,102,300
Type 1 Diabetes	0	0	0
Rescission	0	0	0
Supplemental	0	0	0
Subtotal, adjusted appropriation	2,051,798	2,051,798	2,102,300
Real transfer under Director's one-percent transfer authority (GEI)	(3,228)	0	0
Real transfer under Secretary's one-percent transfer authority	(307)	0	0
Comparative Transfers to NLM for NCBI and Public Access	(910)	(1,745)	0
Comparative transfer under Director's one-percent transfer authority (GEI)	3,228	0	0
Subtotal, adjusted budget authority	2,050,581	2,050,053	2,102,300
Unobligated balance, start of year	0	0	0
Unobligated balance, end of year	0	0	0
Subtotal, adjusted budget authority	2,050,581	2,050,053	2,102,300
Unobligated balance lapsing	(151)	0	0
Total obligations	2,050,430	2,050,053	2,102,300

¹ Excludes the following amounts for reimbursable activities carried out by this account:
FY 2010 - \$1,188 FY 2011 - \$5,000 FY 2012 - \$5,000

NATIONAL INSTITUTES OF HEALTH
National Institute of General Medical Sciences
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	2,873	\$1,034,101	2,722	\$996,929	2,777	\$1,033,155	(96)	(\$946)
Administrative Supplements	<i>(173)</i>	13,678	<i>(226)</i>	17,878	<i>(226)</i>	18,057	<i>(53)</i>	4,379
Competing:								
Renewal	442	178,004	487	200,495	474	197,083	32	19,079
New	447	157,986	456	163,251	436	157,433	(11)	(553)
Supplements	2	239	1	122	1	123	(1)	(116)
Subtotal, Competing	891	\$336,229	944	\$363,868	911	\$354,639	20	\$18,410
Subtotal, RPGs	3,764	\$1,384,008	3,666	\$1,378,675	3,688	\$1,405,851	(76)	\$21,843
SBIR/STIR	140	\$48,839	136	\$47,317	139	\$48,533	(1)	(\$306)
Research Project Grants	3,904	\$1,432,847	3,802	\$1,425,992	3,827	\$1,454,384	(77)	\$21,537
Research Centers								
Specialized/Comprehensive	50	\$167,903	52	\$167,893	52	\$169,576	2	\$1,673
Clinical Research	0	0	0	0	0	0	0	0
Biotechnology	0	1,000	0	1,000	0	1,000	0	0
Comparative Medicine	0	309	0	319	0	328	0	19
Research Centers in Minority Institutions	0	0	0	0	0	0	0	0
Research Centers	50	\$169,212	52	\$169,212	52	\$170,904	2	\$1,692
Other Research								
Research Careers	98	\$21,436	104	\$21,436	105	\$21,650	7	\$214
Cancer Education	0	0	0	0	0	0	0	0
Cooperative Clinical Research	0	0	0	0	0	0	0	0
Biomedical Research Support	0	0	0	0	0	0	0	0
Minority Biomedical Research Support	353	100,878	353	100,878	357	101,887	4	1,009
Other	133	34,209	145	34,209	145	34,551	12	342
Other Research	584	\$156,523	602	\$156,523	607	\$158,088	23	\$1,565
Total Research Grants	4,538	\$1,758,582	4,456	\$1,751,727	4,486	\$1,783,376	(52)	\$24,794
Research Training								
Individual Awards	<u>FTIPs</u> 456	\$20,388	<u>FTIPs</u> 456	\$20,717	<u>FTIPs</u> 456	\$21,131	0	\$743
Institutional Awards	3,885	177,169	3,885	178,816	3,885	182,392	0	5,223
Total Research Training	4,341	\$197,557	4,341	\$199,533	4,341	\$203,523	0	\$5,966
Research & Development Contracts <i>(SBIR/STTR)</i>	27	\$33,089	27	\$35,839	27	\$51,818	0	\$18,729
	<i>0</i>	<i>(\$96)</i>	<i>0</i>	<i>(\$96)</i>	<i>0</i>	<i>(\$96)</i>	<i>0</i>	<i>\$0</i>
Intramural Research	<u>FIEs</u> 9	\$2,816	<u>FIEs</u> 9	\$2,816	<u>FIEs</u> 9	\$2,844	<u>FIEs</u> 0	\$28
Research Management and Support	133	58,537	133	60,138	133	60,739	0	2,202
Construction	0	0	0	0	0	0	0	0
Buildings and Facilities	0	0	0	0	0	0	0	0
Total, NIGMS	142	\$2,050,581	142	\$2,050,053	142	\$2,102,300	0	\$51,719

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 briefly 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 NIGMS, which is \$51.719 million more than the FY 2010 Actual Budget, for a total of \$2,102.300 million.

Research Project Grants (+\$21.843 million; total \$1,405.851 million): NIGMS will continue to maintain an adequate number of competing RPGs—911 awards in FY 2012, an increase of 20 awards from FY 2010. About 2,777 noncompeting RPGs awards, totaling \$1,033.155 million also will be made in FY 2012. The NIH budget policy for RPGs in FY 2012 is to provide for a 1% inflationary increase in noncompeting awards and a 1% increase in average cost for competing RPGs.

Research and Development Contracts (+\$18.729 million; total \$51.818 million): NIGMS will continue to support in FY2012 development of a state-of-the-art National Synchrotron Light Source-II (NSLS-II) at the Brookhaven National Laboratory. Synchrotron radiation is a critical tool for biomedical researchers and will support the research of investigators from at least 20 NIH Institutes/Centers.

NATIONAL INSTITUTES OF HEALTH
National Institute of General Medical Sciences
Summary of Changes
(Dollars in Thousands)

FY 2010 Actual				\$2,050,581
FY 2012 Estimate				2,102,300
Net change				\$51,719
CHANGES	2012 Estimate		Change from FY 2010	
	FTEs	Budget Authority	FTEs	Budget Authority
A. Built-in:				
1. Intramural Research:				
a. Annualization of January 2010 pay increase				
		\$1,488		9
b. January FY 2012 pay increase				
		1,488		0
c. One less day of pay (n/a for 2011)				
		1,488		(6)
d. Payment for centrally furnished services				
		155		2
e. Increased cost of laboratory supplies, materials, and other expenses				
		1,201		11
Subtotal				\$16
2. Research Management and Support:				
a. Annualization of January 2010 pay increase				
		\$19,707		119
b. January FY 2012 pay increase				
		19,707		0
c. One less day of pay (n/a for 2011)				
		19,707		(76)
d. Payment for centrally furnished services				
		14,632		145
e. Increased cost of laboratory supplies, materials, and other expenses				
		26,400		259
Subtotal				\$447
Subtotal, Built-in				\$463

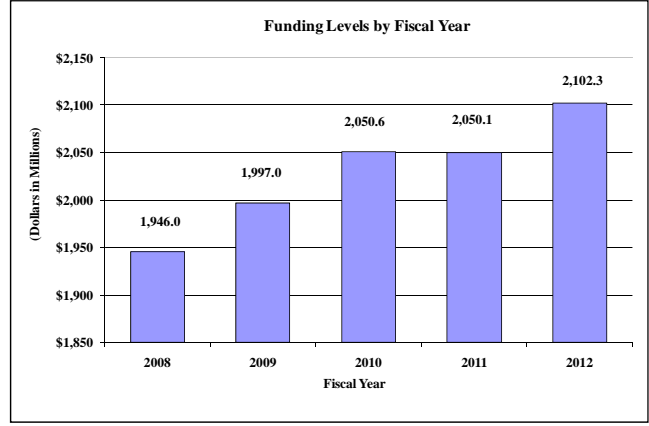
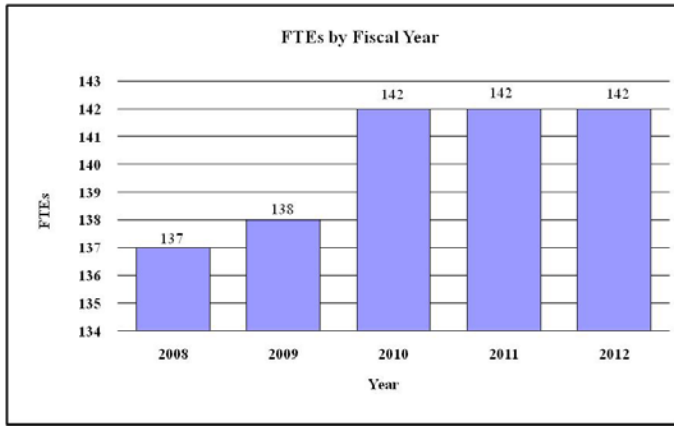
NATIONAL INSTITUTES OF HEALTH
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Summary of Changes--continued

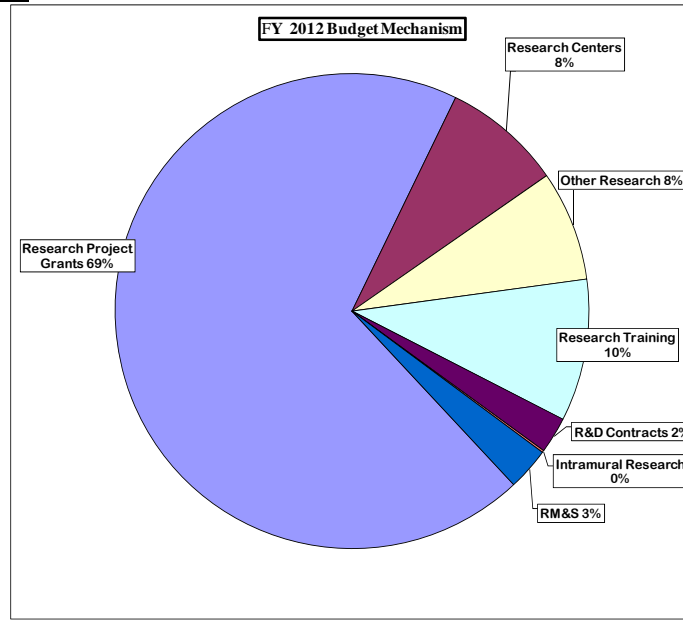
CHANGES	2012 Estimate		Change from FY 2010	
	No.	Amount	No.	Amount
B. Program:				
1. Research Project Grants:				
a. Noncompeting	2,777	\$1,051,212	(96)	\$3,433
b. Competing	911	354,639	20	18,410
c. SBIR/STTR	139	48,533	(1)	(306)
Total	3,827	\$1,454,384	(77)	\$21,537
2. Research Centers	52	\$170,904	2	\$1,692
3. Other Research	607	158,088	23	1,565
4. Research Training	4,341	203,523	0	5,966
5. Research and development contracts	27	51,818	0	18,729
Subtotal, Extramural		\$2,038,717		\$49,489
6. Intramural Research	<u>FTEs</u> 9	\$2,844	<u>FTEs</u> 0	\$12
7. Research Management and Support	133	60,739	0	\$1,755
8. Construction		0		0
9. Buildings and Facilities		0		0
Subtotal, program	142	\$2,102,300	0	\$51,256
Total changes			0	\$51,719

Fiscal Year 2012 Budget Graphs

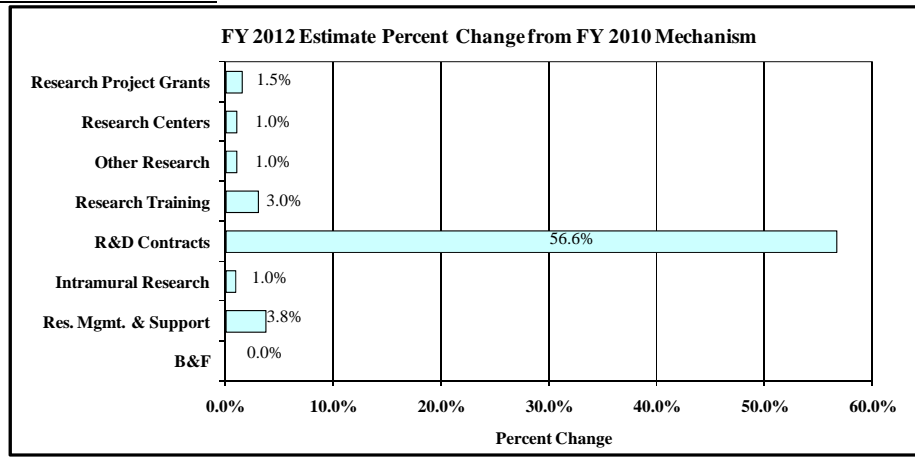
History of Budget Authority and FTEs:



Distribution by Mechanism:



Change by Selected Mechanisms:



NATIONAL INSTITUTES OF HEALTH
National Institute of General Medical Sciences
Budget Authority by Activity
(Dollars in thousands)

	FY 2010 Actual		FY 2011 CR		FY 2012 PB		Change vs. FY 2010	
	FTEs	Amount	FTEs	Amount	FTEs	Amount	FTEs	Amount
Extramural Research								
<u>Detail:</u>								
Cell Biology and Biophysics		\$566,283		\$564,772		\$579,770		\$13,487
Genetics and Developmental Biology		540,110		538,976		552,973		\$12,863
Pharmacology, Physiology and Biological Biological Chemistry		415,059		413,952		424,944		\$9,885
Bioinformatics and Computational Biology		132,380		132,027		135,533		\$3,153
Minority Opportunities in Research		137,839		137,839		141,974		\$4,135
Training		197,557		199,533		203,523		\$5,966
Subtotal, Extramural		\$1,989,228		\$1,987,099		\$2,038,717		\$49,489
Intramural Research	9	\$2,816	9	\$2,816	9	\$2,844	0	\$28
Research Management & Support	133	\$58,537	133	\$60,138	133	\$60,739	0	\$2,202
TOTAL	142	\$2,050,581	142	\$2,050,053	142	\$2,102,300	0	\$51,719

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 Institute of General Medical Sciences**

Authorizing Legislation

	PHS Act/ Other Citation	U.S. Code Citation	2010 Amount Authorized	FY 2010 Estimate	2012 Amount Authorized	FY 2012 PB
Research and Investigation	Section 301	42§241	Indefinite	\$2,050,581,000	Indefinite	\$2,102,300,000
National Institute of General Medical Sciences	Section 401(a)	42§281	Indefinite		Indefinite	
Total, Budget Authority					\$2,050,581,000	\$2,102,300,000

NATIONAL INSTITUTES OF HEALTH
National Institute of General Medical Sciences

Appropriations History

Fiscal Year	Budget Estimate to Congress	House Allowance	Senate Allowance	Appropriation
2003	\$1,874,243,000	\$1,874,243,000	\$1,853,584,000	\$1,859,084,000
Rescission				(\$12,084,000)
2004	\$1,923,133,000	\$1,923,133,000	\$1,917,033,000	\$1,916,333,000
Rescission				(\$11,495,000)
2005	\$1,959,810,000	\$1,959,810,000	\$1,975,500,000	\$1,959,810,000
Rescission				(\$15,743,000)
2006	\$1,955,170,000	\$1,955,170,000	\$2,002,622,000	\$1,955,170,000
Rescission				(\$19,552,000)
2007	\$1,923,481,000	\$1,923,481,000	\$1,934,888,000	\$1,935,618,000
Rescission				\$0
2008	\$1,941,462,000	\$1,966,019,000	\$1,978,601,000	\$1,970,228,000
Rescission				(\$34,420,000)
Supplemental				\$10,296,000
2009	\$1,937,690,000	\$2,004,295,000	\$1,991,609,000	\$1,997,801,000
Rescission				\$0
2010	\$2,023,677,000	\$2,069,156,000	\$2,031,886,000	\$2,051,798,000
Rescission				\$0
2011	\$2,125,090,000		\$2,121,783,000	
Rescission				
2012	\$2,102,300,000			

Justification of Budget Request

National Institute for General Medical Sciences

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

Budget Authority (BA):

	FY 2010 Actual	FY 2011 Continuing Resolution	FY 2012 Budget Request	FY 2012 +/- FY 2010
BA	\$2,050,581,000	\$2,050,053,000	\$2,102,300,000	\$51,719,000
FTE	142	142	142	0

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

Director's Overview

For nearly 50 years, the National Institute of General Medical Sciences (NIGMS) has been a powerful engine of discovery. As NIH's "basic research institute," NIGMS has built a strong foundation of knowledge about health and disease. The NIGMS mission is appropriately broad to enable discovery in many areas of study--ranging from the properties and behavior of molecules and cells to the spread of disease within entire communities. NIGMS is proud to have supported the research of numerous Nobel Prize winners in Physiology or Medicine. This past year was no different, with an NIGMS-supported scientist sharing a Nobel for his discovery of a groundbreaking chemistry method that is used routinely in the medical, electronic, and agricultural industries.

Tools for Faster Discovery

The Institute's investment in enabling technologies continues to be robust. One of NIGMS' signature efforts for the support of rapid, high-volume technology is its Protein Structure Initiative (PSI). In July 2010, the Institute launched PSI:BiologY. This new program supports research partnerships between groups of biologists and high-throughput structure determination centers to solve medically important problems.

In 2010, NIGMS also enhanced its support of systems biology, by adding two new National Centers for Systems Biology. As with the 10 other currently funded centers, the new centers will integrate approaches from engineering, genomics, systems biology, and synthetic biology to identify mechanisms and structural features involved in common cellular behaviors, including the response to disease-causing microorganisms, poisons, and metabolic imbalances.

Basic Science for Better Health Care

The basis of sound health care is solid scientific evidence for making treatment-related decisions. A long-standing interest area within the NIGMS research portfolio is pharmacogenomics, which seeks to understand how medication response varies among individuals because of inherited differences. NIGMS leads the trans-NIH Pharmacogenomics Research Network (PGRN), a nationwide collaboration of scientists (see page 18 for Program Portrait). Over the next five years, this effort will expand our understanding of medication response through the use of cutting-edge DNA sequencing methods and statistical analyses, as well as pilot studies to learn about medication response from de-identified medical records in health care systems.

In a compelling advance from 2010, scientists at Stanford and Harvard teamed up to use a healthy person's complete genome sequence to generate a first-of-its-kind personalized risk report. The researchers accomplished this feat by comparing the individual's genetic signatures against several databases of disease-related gene variants, and then also factored in the patient's medical and family history and statistical disease risks. This tailored "risk report" is a potential model for truly personalized medicine.

Feeding the Therapeutic Pipeline

NIGMS-funded discoveries continue to pave the way toward new ways to treat illness and injury. This past year researchers discovered important new information about how wounds heal in the skin. They learned that skin cells that travel to a severe wound go into a cellular "holding pattern" called senescence and instead of dividing, the cells secrete substances that help remodel the surrounding skin, effectively preventing scar formation. This new knowledge may inform therapies to slow or prevent the formation of scar tissue in critical organs--such as the liver after hepatitis infection. Scar tissue in organs can impair their function.

Another 2010 example of NIGMS-funded basic research directly relevant to disease is a large, gene-scanning project that looked for potential, non-inherited interactions between the environment and our genes. In this research, an NIGMS-funded physician scientist (a combined pediatrician/computer modeler) examined hundreds of environmental factors for their potential role in causing type 2 diabetes. The search turned up 226 factors that appear to contribute to the onset of disease. These included known toxins like polychlorinated biphenyls and also new suspects such as a pesticide product and a common form of vitamin E. The results offer important new clues for diabetes researchers to follow.

The Wide Reach of Basic Research

Computational modeling is a powerful tool for understanding disease outbreaks and predicting the implications of specific public health measures. The NIGMS-funded Models of Infectious Disease Agent Study (MIDAS) program develops computational models for conducting virtual experiments to test how emerging pathogens might spread in the presence and absence of interventions. Using data from real populations and geographical locations, interdisciplinary MIDAS researcher teams have created computer simulations that help predict a range of public health outcomes for epidemics of flu and other diseases in the United States, Mexico, and India.

NIGMS-supported research related to HIV/AIDS also has significant global health relevance. In 2010, scientists solved the three-dimensional structure of a molecule involved in HIV infection and in many forms of cancer. The research shed light on CXCR4, a molecule that acts as cellular gateway for HIV and harmful substances. While scientists have known about CXCR4 for 15 years, until now they have lacked detailed information about how it functions. Knowing the structure has helped scientists understand the molecular properties and features of this previously enigmatic molecule.

The Future of Discovery

NIGMS has a long-standing commitment to fostering a highly capable biomedical and behavioral research workforce. Science and the conduct of research continue to evolve, though, as do workforce needs. For this reason, this past year, NIGMS completed an intensive process to develop a strategic plan for future research training and career development. Through a series of regional meetings across the country, the Institute gathered information and data, as well as input from the scientific community. This enabled us to prioritize the steps necessary to create and sustain a healthy and productive research training environment that mirrors the composition of America. A key theme in the plan, released in early 2011, is the importance of putting the needs of trainees first--by focusing on mentoring, career guidance, and diversity.

Overall Budget Policy: The FY 2012 request for NIGMS is \$2,102.300 million, an increase of \$51.719 million or +2.5 percent over the FY 2010 Actual Budget.

Investigator-initiated research projects and early career investigator research are the Institute's highest priorities. NIGMS will continue to support new investigators and to maintain an adequate number of competing RPGs. Developing a strong scientific workforce is a core element of the NIGMS mission. In FY 2012, NIGMS will continue to emphasize the support new investigators.

In addition to our research funding activities, we support this goal through a range of training programs. NIGMS will provide an across-the-board increase of four percent for stipend levels under the Ruth L. Kirschstein National Research Service Award training program to continue efforts to attain stipend levels recommended by the National Academy of Sciences. This will build on the two percent increase in stipend levels for FY 2011. Stipend levels were largely flat for several years, and the requested increase will help to sustain the development of a highly qualified biomedical research workforce.

Funds are included in R&D contracts to reflect NIGMS's share of NIH-wide funding required to support several trans-NIH initiatives, such as the Therapies for Rare and Neglected Diseases program (TRND), the Basic Behavioral and Social Sciences Opportunity Network (OppNet), and support for a new synchrotron at the Brookhaven National Laboratory. For example, each IC that will benefit from the new synchrotron will provide funding to total NIH's commitment to support this new technology--\$10 million.

Intramural Research and Research Management and Support receive modest increases predominantly to support inflationary increases.

Program Descriptions and Accomplishments

Cell Biology and Biophysics: The Cell Biology and Biophysics (CBB) program fosters the study of cells and their components. Physics- and chemistry-based technological advances, driven by new types of microscopy, structural biology tools, and many other novel imaging techniques have deepened understanding of life at the level of molecules and atoms. This critical basic research promotes the development of precise, targeted therapies, as well as diagnostics for a range of diseases. In FY 2010, the program launched PSI:Biology, the third phase of the Protein Structure Initiative (PSI), which is aimed at making protein structure determination faster, cheaper and easier. PSI:Biology, which will extend through FY 2015, will make PSI-generated technologies and other resources available to the broad scientific community to solve a range of biomedical relevant problems, while developing technology to tackle increasingly complex protein structures.

Budget Policy: The FY 2012 budget estimate for this program is \$579.770 million, an increase of \$13.487million and 2.4 percent over the FY 2010 Actual Budget. The majority of CBB funds will be used to support investigator-initiated research projects in cell biology, biophysics, cellular imaging, and structural biology. In FY 2012, CBB will support PSI:Biology, which will make Protein Structure Initiative (PSI)-generated technologies and other resources available to the broad scientific community. CBB will also use FY 2012 funds to support programs in single-molecule technologies and an AIDS-related structural biology program.

Program Portrait: Investigator-Initiated Research in Microbial Community Dynamics

FY 2010 level: \$0
FY 2012 level: \$2.5 million
Change: \$2.5 million

Microorganisms account for over 90 percent of the cells that make up the human body. Each of us has our own “microbiome” that forms communities that adapt precisely to the different local environments of our many organs and tissues. Recent studies have demonstrated clearly that these microbial communities foster health and prevent infection, but very little is known about the details. The Human Microbiome Project (HMP), launched in December 2007 as part of the NIH Roadmap for Medical Research, is currently cataloguing comprehensively the genome sequences of these hundreds of microbial species that play a role in human health and disease. However, although the HMP gathers massive amounts of DNA sequencing information, researchers know that DNA sequence alone does not explain fully what drives microbial communities to assemble and thrive in humans. Aiming to build upon this growing body of knowledge, NIGMS convened a meeting in November 2008 to consider basic research avenues that may deepen biological understanding of the dynamic interactions between humans and the microorganisms that live on and within our bodies. Conference attendees, representing leaders in the emerging field of host-associated microbial community ecology, identified critical questions and approaches needed to advance science in this intriguing area of biomedicine. In fall 2009, NIGMS issued a funding solicitation entitled “Dynamics of Host-Associated Microbial Communities,” which attracted a large number of high-quality applications for R01 grants from scientists wishing to use genetic, physiological, and ecological methods to study mixed microbial communities and their internal dynamics, as well as to investigate how those dynamics affect the host organism. NIGMS will fund six such research projects in FY 2011. These projects will employ a variety of model systems, including mice, fruit flies, medicinal leeches, zebrafish, and lung cells from people with cystic fibrosis. Although this NIGMS-sponsored research program is just getting off the ground, it is timed perfectly to complement the ongoing efforts of the NIH-wide HMP, as well as to provide critical insights for new ways to diagnose, treat, and prevent the wide array of human diseases and conditions influenced by the human microbiome.

Genetics and Developmental Biology: The Genetics and Developmental Biology (GDB) program promotes basic research on fundamental mechanisms of inheritance and development. This research provides a strong foundation for more targeted projects supported by other NIH components. Although much of GDB's investigator-initiated research is performed in model organisms, GDB also plans to expand its support for human research that applies systematic approaches to better understand health and disease. A workshop on this topic will be convened in FY 2011, which may lead to a call for research grant applications in FY 2012. Also in FY 2010, the Program continued to support research on the basic biology of embryonic stem cells by continuing to fund five program project grants. In FY 2011, GDB plans to fund several new program project grants focused on understanding the fundamental biology of pluripotency and genetic reprogramming of induced pluripotent stem cells.

Budget Policy: The FY 2012 budget estimate for this program is \$552.973 million, an increase of \$12.863 million and 2.4 percent over the FY 2010 Actual Budget. As with FY 2011, most GDB expenditures will support individual investigators seeking fundamental knowledge about life processes. In FY 2012, GDB will continue its support for collaborative research for molecular and genomic studies of behavior in animal models.

Pharmacology, Physiology, and Biological Chemistry: The Pharmacology, Physiology, and Biological Chemistry (PPBC) program supports fundamental research in chemistry, biochemistry, pharmacology, and physiology that contributes to understanding human biology in health and disease and that generates knowledge for new ways to diagnose and treat disease. The program also funds research that explores clinical issues involving whole-body responses in important public health areas such as traumatic injury, burns, wound healing, and anesthesia. In FY 2010, PPBC sponsored a workshop in Quantitative and Systems Pharmacology to stimulate research that integrates traditional drug pharmacology with modern genomic/proteomic technologies and computational modeling and analysis. In FY 2010, PPBC staff also participated in an effort to coordinate research in emergency medicine across NIH.

Budget Policy: The FY 2012 budget estimate for this program is \$424.944 million, an increase of \$9.885 million and 2.4 percent over the FY 2010 Actual Budget. PPBC will continue to emphasize the support of investigator-initiated research grants. In FY 2012, the Pharmacogenetics Research Network, which is working toward promoting the goal of personalized medicine, will advance into new trans-NIH areas of research while supporting training of the next generation of clinician-scientists. (See the Program Portrait)

Program Portrait: The NIH Pharmacogenomics Research Network

FY2010 level: \$22.3 million

FY2012 level: \$21.6 million

Change: -\$0.7 million

In 2000, NIGMS launched the NIH Pharmacogenomics Research Network (PGRN), a partnership of research groups that studies how genetic information can predict and improve outcomes for drug therapies. In time, this research aims to use DNA-based information to personalize medicine in routine clinical practice. Since its inception, the PGRN has garnered substantial interest across NIH, and the program now enjoys the participation of nine NIH components that fund nearly 200 researchers across the nation. To date, the PGRN has conducted and published more than 1,000 basic and clinical research studies, which have contributed substantially to the foundation of knowledge about this important area of modern biomedicine. Because the PGRN is trans-NIH in nature, it has been able to address the study of drugs used to treat a wide array of diseases and conditions, including heart disease, asthma, various cancers, depression, and addiction. Other PGRN-focused research has examined the cellular and molecular steps that define how the body absorbs, distributes, metabolizes, and gets rid of medicines. The PGRN has made important inroads in defining gene-drug interactions, and this progress has made its way to the Food and Drug Administration, adding to re-labeling efforts toward improving drug safety and effectiveness. In addition to performing individual research studies, PGRN members also work cooperatively and strategically. In past years, they have built alliances with key stakeholders outside the network to assure that the endeavor is more than the sum of its parts. One example is the International Warfarin Pharmacogenetics Consortium, a data-sharing study in which investigators pooled genetic and clinical information to arrive at consensus for DNA-guided dosing. Another is a global alliance between the PGRN and the Japanese RIKEN Center for Genomic Medicine, which involves a series of collaborative projects studying medication response across several disease areas, using state-of-the-art genome sequencing methods. NIH recently decided to renew the PGRN program for an additional five years, beginning in 2010. The newly expanded network will continue its ongoing research, and will also move into new areas of study, including rheumatoid arthritis and bipolar disorder. The PGRN, working together with NIH's Clinical and Translational Science Award program, will also support training for the next generation of clinician-scientists, so that they are well-prepared to address implementation of pharmacogenomics into practice.

Bioinformatics and Computational Biology: The Center for Bioinformatics and Computational Biology (CBCB) supports research that draws expertise from mathematics, statistics, computer science, engineering, and physics to solve problems in biomedicine. CBCB emphasizes integrated systems approaches that combine computational studies with laboratory-based investigations that authenticate models. Other projects create virtual laboratories that address questions that for a variety of reasons may be difficult to tackle in the laboratory. CBCB also encourages the development of tools and techniques to acquire, store, analyze and visualize data. In FY 2010, CBCB funded two new National Centers for Systems Biology to advance the study of the complexity of biology and to train more scientists in this emerging field. This national effort, launched in 2002 and now totaling 12 centers, continues to broaden and enhance our understanding of the complex interactions between cells, tissues, and organisms.

Budget Policy: The FY 2012 budget estimate for this program is \$135.533 million, an increase of \$3.153million and 2.4 percent over the FY 2010 Actual Budget. Highest priority will be given to investigator-initiated research, since this research will continue to yield information and tools for exploring complex biological systems. Two major initiatives employing FY 2012 funds are the Models of Infectious Disease Agent Study (MIDAS), which models the spread of infectious diseases, and the Centers for Systems Biology program, which currently funds 12 centers.

Minority Opportunities in Research: The Minority Opportunities in Research (MORE) program aims to increase diversity within the biomedical and behavioral research workforce. Efforts target diversity broadly, addressing groups underrepresented in biomedical and behavioral sciences, including certain racial and ethnic minorities, people with disabilities, and people from low-income families. The program provides research support for faculty at minority-serving institutions, and this support enhances opportunities for student participation in research projects. In FY 2010, MORE funded a workshop to promote greater collaboration between biomedical and social scientists, testing assumptions and hypotheses that undergird interventions for boosting careers in biomedical and behavioral research. The program held several regional technical assistance workshops to help institutions develop stronger student development programs. The MORE program also hosted a technical assistance workshop on how to provide better skills development activities and support services for underrepresented students.

Budget Policy: The FY 2012 budget estimate for this program is \$141.974 million, an increase of \$4.135 million and 3.0 percent over the FY 2010 Actual Budget. In FY 2012, NIGMS program staff will continue to reorganize existing programs to comply with recommendations issued from a working group of the NAGMS Council. In FY 2012, MORE will also continue to examine the current state of research on interventions that influence the participation of underrepresented minorities in the biomedical and behavioral science.

Research Training: The Research Training program provides research training support for the next generation of biomedical and behavioral scientists. In addition to training Ph.D. and M.D.-Ph.D. students, the program supports postdoctoral fellows through advanced and specialized training in basic, translational, and clinical research. This program also features 12 pre-doctoral institutional training grant areas (T32s), which provide broad-based, multidisciplinary research training in several areas of biomedicine. Independent of institutional training grant activities, the program also supports the training of students and fellows working in individual-investigator laboratories, as well as mentored career development awards in five clinical areas. In FY 2010, the program continued the Community for Advanced Graduate Training, a Web-based tool to facilitate interactions and recruitment efforts between the NIGMS Minority Access to Research Careers (MARC) programs and the Institute's predoctoral T32 programs. NIGMS recently initiated a strategic planning process for training and career development: the Strategic Plan will be available in early 2011.

Budget Policy: The FY 2012 budget estimate for this program is \$203.523 million, an increase of \$5.966 million and 3.0 percent above the FY 2010 Actual Budget. Consistent with overall NIH policy, NIGMS will be providing a 4% stipend increase in FY2012. Maintaining a healthy pipeline of researchers is critical to maintaining the vibrancy of the scientific enterprise. NIGMS will continue to support rigorous research training programs that foster intellectual creativity, learning of quantitative skills, and exposure to topics in human health. In FY 2012, NIGMS will continue its new program supporting the research training of basic behavioral scientists and will promote strategies outlined in the NIGMS Strategic Plan for Biomedical and Behavioral Research Training.

Intramural: The Institute has a small, but unique intramural research program, the NIGMS Pharmacology Research Associate program, which supports postdoctoral research fellows for up

to three years. Fellows pursue research under the guidance of a scientist from either an NIH or FDA laboratory, and they also receive specialized training and career mentoring from NIGMS staff. The program is intended for basic or clinical scientists seeking advanced training in pharmacology, or for pharmacology trainees who wish to broaden their skill sets in another area of biomedicine. A number of former program participants have gone on to distinguished careers in academia, industry, and government, and one has won a Nobel Prize.

Budget Policy: The FY 2012 budget estimate for the Intramural Research program is \$2.844 million, an increase of \$28 thousand and 1.0 percent over the FY 2010 Actual Budget. NIGMS will continue its PRAT program, which provides training for outstanding fellows who conduct research in intramural laboratories of other NIH institutes and centers or in FDA laboratories. After their NIH training, the PRAT fellows continue their careers as faculty at leading universities, in the pharmaceutical industry, or at government agencies, contributing pharmacology expertise and helping to meet national needs.

Research Management and Support: NIGMS Research Management and Support (RMS) activities provide administrative, budgetary, logistical, and scientific support in the review, award, and monitoring of research grants, training awards, and research and development contracts. The Program also encompasses strategic planning, coordination, and evaluation of the Institute's programs; regulatory compliance; and international coordination and liaison with other Federal agencies, Congress, and the public. The RMS program funds improvements in information technology tools to facilitate the peer review process, conduct portfolio analysis, and assist with document management. In FY 2012, RMS funds will be used to transform the NIGMS computing infrastructure into a virtual environment. One of the benefits will be a significant reduction in the Institute's energy utilization, as well as a more flexible and responsive information technology environment to better serve the business needs of NIGMS and its customers. The RMS program will also implement the Institute's information technology disaster recovery plans, which will enhance greatly NIGMS' ability to sustain mission-critical operations during a pandemic or other emergency

Budget Policy: The FY 2012 budget estimate for RMS is \$60.739 million, an increase of \$2.202 million and 3.76 percent over the FY 2010 Actual Budget. In FY 2012, RMS funds will continue to support development of the Institute's computing infrastructure to better serve the business needs of NIGMS and enhance security and emergency preparedness, while reducing energy consumption. RMS funds will also contribute to the administration of the NIH Basic Behavioral and Social Science Research Opportunity Network (OppNet).

NATIONAL INSTITUTES OF HEALTH
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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	142	142	0	0.0%
Full-time equivalent of overtime and holiday hours	0	0	0	0.0%
Average ES salary	\$0	\$0	\$0	0.0%
Average GM/GS grade	12.8	12.8	0.0	0.0%
Average GM/GS salary	\$109,361	\$109,361	\$0	0.0%
Average salary, grade established by act of July 1, 1944 (42 U.S.C. 207)	\$0	\$0	\$0	0.0%
Average salary of ungraded positions	143,233	143,233	0	0.0%
OBJECT CLASSES	FY 2010 Actual	FY 2012 Estimate	Increase or Decrease	Percent Change
Personnel Compensation:				
11.1 Full-time permanent	\$10,100	\$10,122	\$22	0.2%
11.3 Other than full-time permanent	5,894	5,906	12	0.2%
11.5 Other personnel compensation	515	516	1	0.2%
11.7 Military personnel	0	0	0	0.0%
11.8 Special personnel services payments	423	423	0	0.0%
Total, Personnel Compensation	\$16,932	\$16,967	\$35	0.2%
12.0 Personnel benefits	\$4,217	\$4,227	\$10	0.2%
12.2 Military personnel benefits	0	0	0	0.0%
13.0 Benefits for former personnel	0	0	0	0.0%
Subtotal, Pay Costs	\$21,149	\$21,194	\$45	0.2%
21.0 Travel and transportation of persons	\$502	\$502	\$0	0.0%
22.0 Transportation of things	25	25	0	0.0%
23.1 Rental payments to GSA	0	0	0	0.0%
23.2 Rental payments to others	0	0	0	0.0%
23.3 Communications, utilities and miscellaneous charges	242	242	0	0.0%
24.0 Printing and reproduction	829	830	1	0.1%
25.1 Consulting services	435	435	0	0.0%
25.2 Other services	7,894	9,466	1,572	19.9%
25.3 Purchase of goods and services from government accounts	100,504	132,303	31,799	31.6%
25.4 Operation and maintenance of facilities	2	2	0	0.0%
25.5 Research and development contracts	6,140	2,863	(3,277)	-53.4%
25.6 Medical care	0	0	0	0.0%
25.7 Operation and maintenance of equipment	114	114	0	0.0%
25.8 Subsistence and support of persons	0	0	0	0.0%
25.0 Subtotal, Other Contractual Services	\$115,089	\$145,183	\$30,094	26.1%
26.0 Supplies and materials	\$225	\$225	\$0	0.0%
31.0 Equipment	791	791	0	0.0%
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	1,911,729	1,933,308	21,579	1.1%
42.0 Insurance claims and indemnities	0	0	0	0.0%
43.0 Interest and dividends	0	0	0	0.0%
44.0 Refunds	0	0	0	0.0%
Subtotal, Non-Pay Costs	\$2,029,432	\$2,081,106	\$51,674	2.5%
Total Budget Authority by Object	\$2,050,581	\$2,102,300	\$51,719	2.5%

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

NATIONAL INSTITUTES OF HEALTH
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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)	\$10,100	\$10,122	\$22	0.2%
Other than full-time permanent (11.3)	5,894	5,906	12	0.2%
Other personnel compensation (11.5)	515	516	1	0.2%
Military personnel (11.7)	0	0	0	0.0%
Special personnel services payments (11.8)	423	423	0	0.0%
Total Personnel Compensation (11.9)	\$16,932	\$16,967	\$35	0.2%
Civilian personnel benefits (12.1)	\$4,217	\$4,227	\$10	0.2%
Military personnel benefits (12.2)	0	0	0	0.0%
Benefits to former personnel (13.0)	0	0	0	0.0%
Subtotal, Pay Costs	\$21,149	\$21,194	\$45	0.2%
Travel (21.0)	\$502	\$502	\$0	0.0%
Transportation of things (22.0)	25	25	0	0.0%
Rental payments to others (23.2)	0	0	0	0.0%
Communications, utilities and miscellaneous charges (23.3)	242	242	0	0.0%
Printing and reproduction (24.0)	829	830	1	0.1%
Other Contractual Services:				
Advisory and assistance services (25.1)	435	435	0	0.0%
Other services (25.2)	7,894	9,466	1,572	19.9%
Purchases from government accounts (25.3)	33,784	39,008	5,224	15.5%
Operation and maintenance of facilities (25.4)	2	2	0	0.0%
Operation and maintenance of equipment (25.7)	114	114	0	0.0%
Subsistence and support of persons (25.8)	0	0	0	0.0%
Subtotal Other Contractual Services	\$42,229	\$49,025	\$6,796	16.1%
Supplies and materials (26.0)	\$221	\$221	\$0	0.0%
Subtotal, Non-Pay Costs	\$44,048	\$50,845	\$6,797	15.4%
Total, Administrative Costs	\$65,197	\$72,039	\$6,842	10.5%

NATIONAL INSTITUTES OF HEALTH
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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
Office of the Director	13		13	13		13	13		13
Office of Scientific Review	11		11	11		11	11		11
Office of Administrative Management	25		25	25		25	25		25
Office of Extramural Activities	36		36	36		36	36		36
Division of Genetic and Developmental Biology	12		12	12		12	12		12
Division of Pharmacology, Physiology and Biological Chemistry	22		22	22		22	22		22
Division of Cell Biology and Biophysics	11		11	11		11	11		11
Division of Minority Opportunities in Research	6		6	6		6	6		6
Center of Bioinformatics and Computational Biology	6		6	6		6	6		6
Total	142	0	142	142	0	142	142	0	142
Includes FTEs which are reimbursed from the NIH Common Fund for Medical Research									
FTEs supported by funds from Cooperative Research and Development Agreements									
FISCAL YEAR	Average GS Grade								
2008	12.5								
2009	12.7								
2010	12.8								
2011	12.8								
2012	12.8								

**NATIONAL INSTITUTES OF HEALTH
National Institute of General Medical Sciences**

Detail of Positions

GRADE	FY 2010 Actual	FY 2011 CR	FY 2012 PB
Total, ES Positions	0	0	0
Total, ES Salary	0	0	0
GM/GS-15	15	15	15
GM/GS-14	37	37	37
GM/GS-13	21	21	21
GS-12	14	14	14
GS-11	11	11	11
GS-10	0	0	0
GS-9	5	5	5
GS-8	2	2	2
GS-7	2	2	2
GS-6	0	0	0
GS-5	0	0	0
GS-4	0	0	0
GS-3	0	0	0
GS-2	0	0	0
GS-1	1	1	1
Subtotal	108	108	108
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	0	0	0
Senior Assistant Grade	0	0	0
Assistant Grade	0	0	0
Subtotal	0	0	0
Ungraded	40	40	40
Total permanent positions	102	102	102
Total positions, end of year	148	148	148
Total full-time equivalent (FTE) employment, end of year	142	142	142
Average ES salary	0	0	0
Average GM/GS grade	12.8	12.8	12.8
Average GM/GS salary	109,361	109,361	109,361