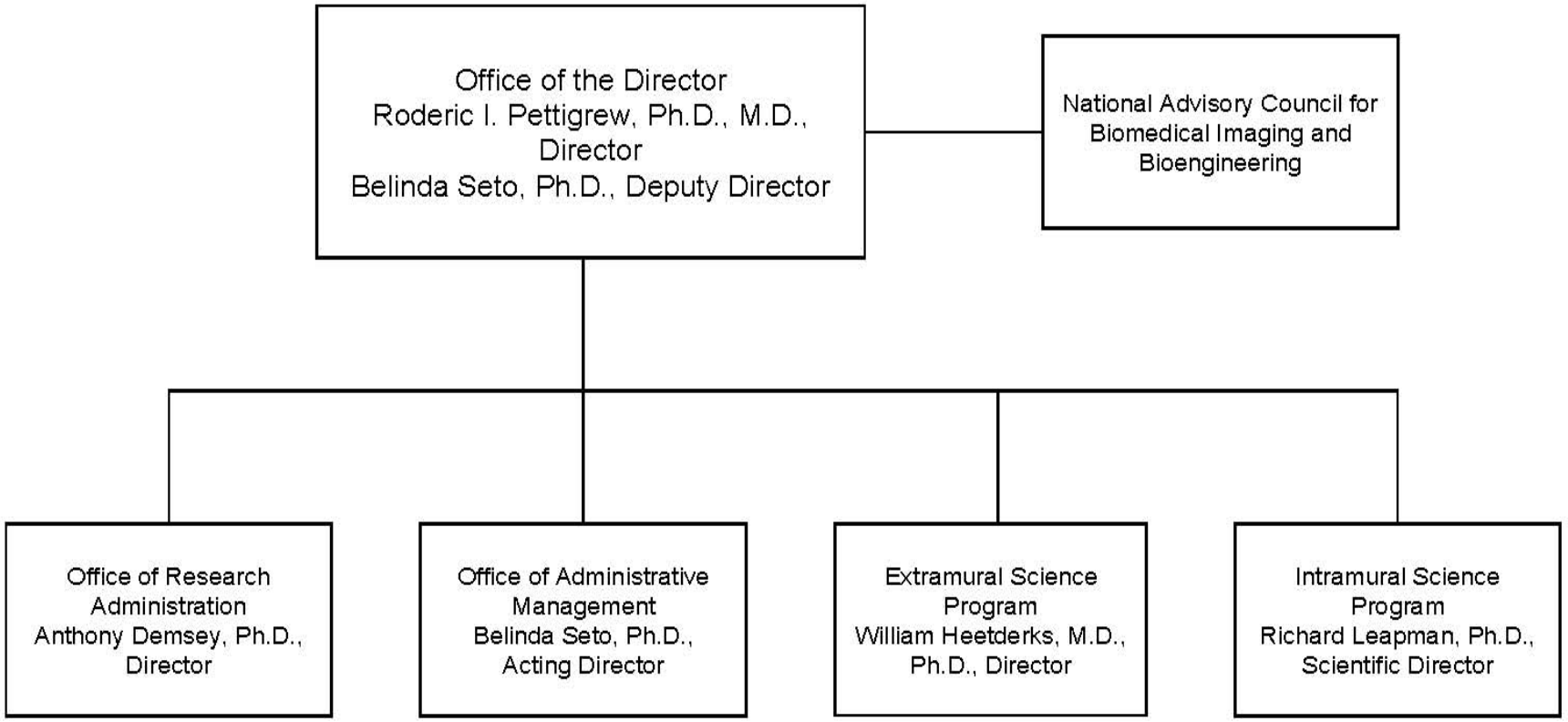
DEPARTMENT OF HEALTH AND HUMAN SERVICES

NATIONAL INSTITUTES OF HEALTH

National Institute of Biomedical Imaging and Bioengineering

NIBIB ORGANIZATIONAL CHART



NATIONAL INSTITUTES OF HEALTH

National Institute of Biomedical Imaging and Bioengineering

For carrying out section 301 and title IV of the Public Health Service Act with respect to biomedical imaging and bioengineering research, [$308,208,000] *$312,687,000*

(Department of Health and Human Services Appropriations Act, 2009)

National Institutes of Health
National Institute of Biomedical Imaging and Bioengineering

Amounts Available for Obligation 1/

Source of Funding	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
Appropriation	$303,955,000	$308,208,000	$312,687,000
Rescission	-5,310,000	0	0
Supplemental	1,588,000	0	0
Subtotal, adjusted appropriation	300,233,000	308,208,000	312,687,000
Real transfer under Director's one-percent transfer authority (GEI)	-507,000	0	0
Comparative transfer under Director's one-percent transfer authority (GEI)	507,000	0	0
Subtotal, adjusted budget authority	300,233,000	308,208,000	312,687,000
Unobligated balance, start of year	0	0	0
Unobligated balance, end of year	0	0	0
Subtotal, adjusted budget authority	300,233,000	308,208,000	312,687,000
Unobligated balance lapsing	0	0	0
Total obligations	300,233,000	308,208,000	312,687,000

1/ Excludes the following amounts for reimbursable activities carried out by this account:
FY 2008 - $3,962,000 FY 2009 Estimate - $3,962,000 FY 2010 Estimate - $3,962,000
Excludes $7,854 Actual in FY 2008, Estimate $75,000 in FY 2009 and Estimate $75,000 in FY 2010 for royalties.

NATIONAL INSTITUTES OF HEALTH

National Institute of Biomedical Imaging and Bioengineering

(Dollars in Thousands)

Budget Mechanism - Total

MECHANISM	FY 2008 Actual		FY 2009 Estimate		FY 2010 Estimate		Change	
Research Grants:	No.	Amount	No.	Amount	No.	Amount	No.	Amount
Research Projects:								
Noncompeting	427	$150,434	402	$159,421	349	$148,088	(53)	-$11,333
Administrative supplements	(15)	923	(15)	923	(15)	923	(0)	0
Competing:								
Renewal	43	24,002	34	19,358	43	24,853	9	5,495
New	131	39,734	101	31,585	127	40,549	26	8,964
Supplements	0	0	0	0	0	0	0	0
Subtotal, competing	174	63,736	135	50,943	170	65,402	35	14,459
Subtotal, RPGs	601	215,093	537	211,287	519	214,413	(18)	3,126
SBIR/STTR	44	7,598	43	7,498	44	7,599	1	101
Subtotal, RPGs	645	222,691	580	218,785	563	222,012	(17)	3,227
Research Centers:								
Specialized/comprehensive	6	8,823	6	9,105	6	9,242	0	137
Clinical research	0	0	0	0	0	0	0	0
Biotechnology	17	17,814	18	18,384	18	18,660	0	276
Comparative medicine	0	0	0	0	0	0	0	0
Research Centers in Minority Institutions	0	0	0	0	0	0	0	0
Subtotal, Centers	23	26,637	24	27,489	24	27,902	0	413
Other Research:								
Research careers	35	4,587	36	4,734	37	4,805	1	71
Cancer education	0	0	0	0	0	0	0	0
Cooperative clinical research	0	0	0	0	0	0	0	0
Biomedical research support	0	0	0	0	0	0	0	0
Minority biomedical research support	0	0	0	0	0	0	0	0
Other	15	1,039	15	1,072	15	1,088	0	16
Subtotal, Other Research	50	5,626	51	5,806	52	5,893	1	87
Total Research Grants	718	254,954	655	252,080	639	255,807	(16)	3,727
Research Training:	FTTPs		FTTPs		FTTPs			
Individual awards	34	1,194	34	1,206	34	1,218	0	12
Institutional awards	182	7,979	252	11,059	255	11,170	3	111
Total, Training	216	9,173	286	12,265	289	12,388	3	123
Research & development contracts	16	12,113	22	16,519	22	16,696	0	177
(SBIR/STTR)	(3)	(18)	(3)	(18)	(3)	(18)	(0)	(0)
	FTEs		FTEs		FTEs		FTEs	
Intramural research	26	7,931	26	10,913	27	11,077	1	164
Research management and support	59	16,062	60	16,431	61	16,719	1	288
Construction		0		0		0		0
Buildings and Facilities		0		0		0		0
Total, NIBIB	85	300,233	86	308,208	88	312,687	2	4,479

Includes FTEs which are reimbursed from the NIH Roadmap for Medical Research

NATIONAL INSTITUTES OF HEALTH
National Institute of Biomedical Imaging and Bioengineering
BA by Program
(Dollars in thousands)

Extramural Research	FY 2006 Actual FTEs	FY 2006 Actual Amount	FY 2007 Actual FTEs	FY 2007 Actual Amount	FY 2008 Actual FTEs	FY 2008 Actual Amount	FY 2008 Comparable FTEs	FY 2008 Comparable Amount	FY 2009 Estimate FTEs	FY 2009 Estimate Amount	FY 2010 Estimate FTEs	FY 2010 Estimate Amount	Change FTEs	Change Amount
Detail:														
Applied Science and Technology		$160,734		$153,819		$160,047		$160,554		$162,712		$164,471		1,758
Discovery Science and Technology		100,331		100,331		96,793		96,793		95,081		96,139		1,059
Technological Competitiveness - Bridging the Sciences		16,249		22,137		18,893		18,893		23,071		24,281		1,210
Subtotal, Extramural		277,314		276,287		275,733		276,240		280,864		284,891		4,027
Intramural research	5	3,802	5	4,265	26	7,931	26	7,931	26	10,913	27	11,077	1	164
Res. management & support	43	15,490	54	15,828	59	16,062	59	16,062	60	16,431	61	16,719	1	288
TOTAL	48	296,606	59	296,380	85	299,726	85	300,233	86	308,208	88	312,687	2	4,479

Includes FTEs which are reimbursed from the NIH Roadmap for Medical Research

Major Changes in the Fiscal Year 2010 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 2010 budget request for NIBIB, which is +$4.479 million more than the FY 2009 Enacted, for a total of $312.687 million.

Research Project Grants (+$3.126 million, total $214.413 million): NIBIB will support a total of 519 Research Project Grant (RPG) awards in FY 2010 (excluding SBIR/STTR). The number of noncompeting awards will decrease by 53 and the funding level will decrease by $11.333 million. The number of competing RPGs will increase by 35 and the funding level will increase by $14.459 million. The NIH budget policy for RPGs in FY 2010 provides a 2% inflationary increase in noncompeting awards and a 2% increase in the average cost for competing RPGs.

Technological Competitiveness - Bridging the Sciences (+$1.210 million; total $24.281 million): In FY 2010 NIBIB will commence the second phase of the Quantum Grant program with $6.000 million, an increase of $1.000 million over the FY 2009 costs of phase one awards. The goal of the Quantum program is to profoundly improve the detection, diagnosis, prevention or treatment of major diseases or national public health problems with new technologies.

NATIONAL INSTITUTES OF HEALTH
National Institute of Biomedical Imaging and Bioengineering
Summary of Changes

FY 2009 enacted				$308,208,000
FY 2010 estimated budget authority				312,687,000
Net change				4,479,000
	FY 2009 Enacted Base		Change from Base	
CHANGES	FTEs	Budget Authority	FTEs	Budget Authority
A. Built-in:				
1. Intramural research:				
a. Annualization of January 2009 pay increase		$1,593,000		$19,000
b. January FY 2010 pay increase		1,593,000		24,000
c. Payment for centrally furnished services		1,186,000		24,000
d. Increased cost of laboratory supplies, materials, and other expenses		8,134,000		131,000
Subtotal				198,000
2. Research management and support:				
a. Annualization of January 2009 pay increase		$8,165,000		$98,000
b. January FY 2010 pay increase		8,165,000		122,000
c. Payment for centrally furnished services		2,778,000		56,000
d. Increased cost of laboratory supplies, materials, and other expenses		5,488,000		94,000
Subtotal				370,000
Subtotal, Built-in				568,000

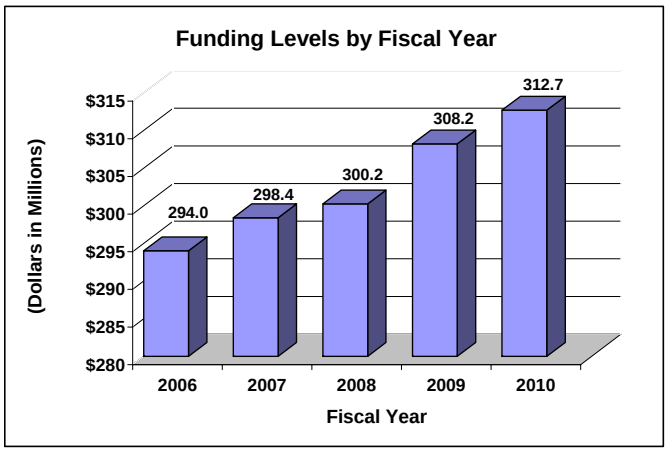
NATIONAL INSTITUTES OF HEALTH
National Institute of Biomedical Imaging and Bioengineering

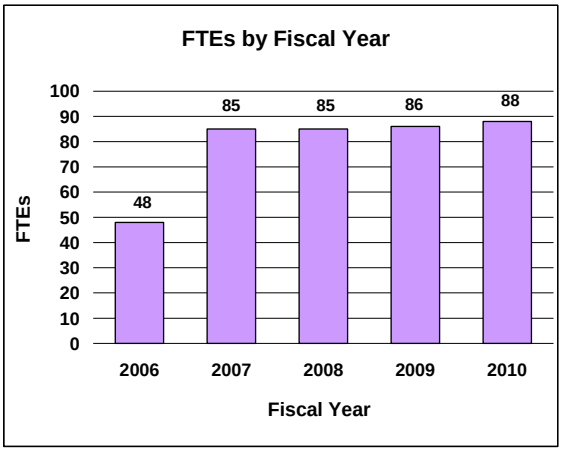
Summary of Changes--continued

CHANGES	FY 2009 Enacted Base No.	FY 2009 Enacted Base Amount	Change from Base No.	Change from Base Amount
B. Program:				
1. Research project grants:				
a. Noncompeting	402	$160,344,000	(53)	($11,333,000)
b. Competing	135	50,943,000	35	14,459,000
c. SBIR/STTR	43	7,498,000	1	101,000
Total	580	218,785,000	(17)	3,227,000
2. Research centers	24	27,489,000	0	413,000
3. Other research	51	5,806,000	1	87,000
4. Research training	286	12,265,000	3	123,000
5. Research and development contracts	22	16,519,000	0	177,000
Subtotal, extramural				4,027,000
	FTEs		FTEs	
6. Intramural research	26	10,913,000	1	(34,000)
7. Research management and support	60	16,431,000	1	(82,000)
Subtotal, program		308,208,000		3,911,000
Total changes	86		2	4,479,000

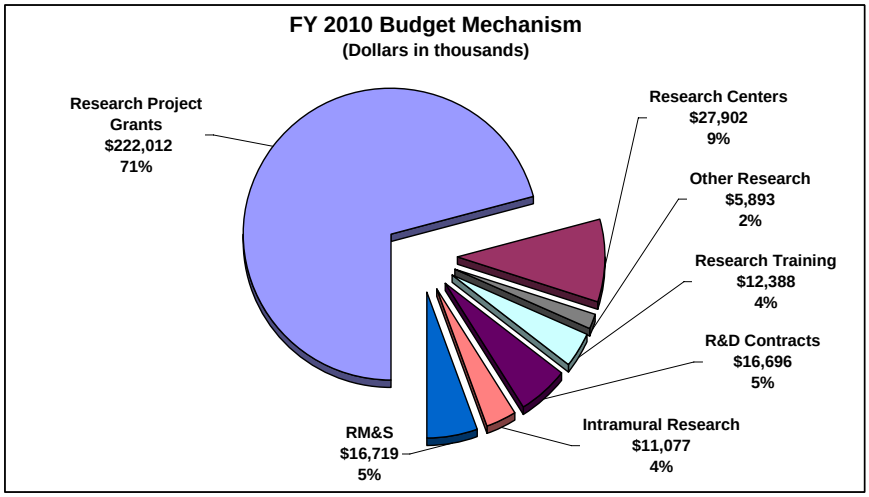
Fiscal Year 2010 Budget Graphs

History of Budget Authority and FTEs:

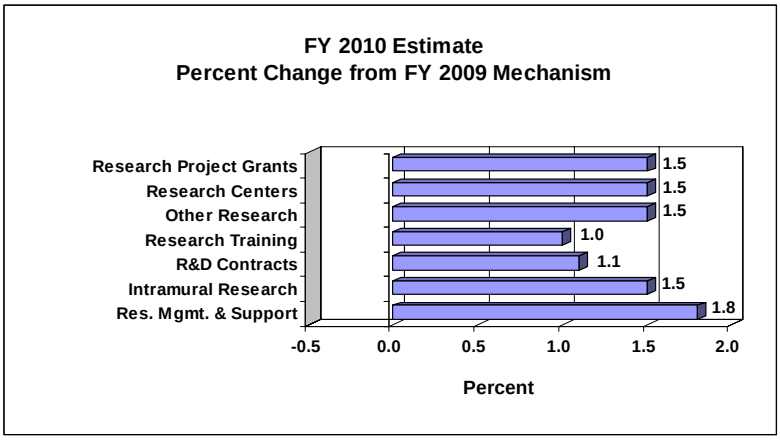




Distribution by Mechanism:



Change by Selected Mechanisms:



Justification
National Institute of Biomedical Imaging and Bioengineering

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

	FY 2008 Appropriation	FY 2009 Omnibus	FY 2009 Recovery Act	FY 2010 President's Budget	FY 2010 +/- FY 2009 Omnibus
BA	$300,233,000	$308,208,000	$77,937,000	$312,687,000	$4,479,000
FTE	85	86	0	88	2

This document provides justification for the Fiscal Year (FY) 2010 activities of the National Institute of Biomedical Imaging and Bioengineering (NIBIB), including HIV/AIDS activities. Details of the FY 2010 HIV/AIDS activities are in the "Office of AIDS Research (OAR)" Section of the Overview, Volume One. Program funds are allocated as follows: Competitive Grants/Cooperative Agreements; Contracts; Direct Federal/Intramural and Other.

In FY 2009, a total of $77,937,000 American Recovery and Reinvestment Act (ARRA) funds were transferred from the Office of the Director. These funds will be used to support scientific research opportunities that help support the goals of the ARRA. The ARRA allows NIH to execute these funds via any NIH funding mechanism. Funds are available until September 30, 2010. These funds are not included in the FY 2009 Omnibus amounts reflected in this document.

Director's Overview

The mission of the NIBIB is to improve human health by leading the development and accelerating the application of biomedical technologies. By focusing on improving health care through technology, NIBIB fills a unique niche at NIH. NIBIB invests its resources in scientific and technological opportunities not only to improve health, but also to support the next generation of researchers.

Biomedical imaging and bioengineering have revolutionized the way Americans receive health care, as well as the quality of care. For example, radiologists often use computer-assisted diagnosis to read mammograms when screening for breast cancer, and utilize ultrasound or MRI to evaluate abnormal findings. Surgical biopsy of non-palpable masses has been replaced with needle biopsy under image or ultrasound guidance. Biopsy of sentinel lymph nodes is aided with optical or radioisotope imaging techniques. While these and other technologies have improved current health care, NIBIB is at the forefront of the development of a number of *new* technologies that will dramatically transform the future of health care with the promise of earlier diagnosis of disease, enabling more effective and less costly treatments, quality care delivered to the entire community in the local setting, and more rapid diagnosis and delivery of therapy at the initial visit to a health care provider.

The NIBIB Quantum Grant program is an example of the potential to transform the future of health care. The Institute is supporting five projects including the development of: an implantable artificial kidney to replace dialysis treatment; tissue engineered pancreatic beta cells to restore glucose control in diabetic individuals and replace insulin therapy; a cell sorter to identify one circulating cancer cell in a billion normal cells to eliminate the possibility of metastasis; a labeling methodology to tag brain tumor cells for surgical resection and optical destruction of remaining cells to replace incomplete surgical resection; and techniques to permit brain cells to regrow following stroke to replace the current therapy which involves retraining other parts of the brain. As this research progresses, NIBIB plans to increase support for the most promising Quantum approaches as they move from the discovery phase to the first in-human phase. NIBIB also supports the Blueprint for neurosciences which includes research on autism.

In addition to research on diagnosis and treatment of major health problems like cancers, NIBIB is also supporting research to make diagnosis and treatment of common problems more rapid, cost effective, and widely available in underserved areas. The Institute supports the development of technologies that enable the delivery of diagnostic services at the time of initial doctor contact or at the “point-of-care” (POC). NIBIB supports research to speed the translation of technology to the clinic, as well as to provide the foundation for the application of technologies such as lab-on-a-chip devices, non-invasive monitoring, and imaging and telehealth technologies. A network of centers is structured to link promising technologies with clinical needs and opportunities. POC technologies will be used in primary and home health care, emergency medicine, and in underserved rural populations. NIBIB is partnering with the Department of Biotechnology of the Ministry of Science and Technology of the Republic of India to engage U.S. and Indian researchers on a common mission to develop low-cost health care technologies to improve global health.

Even the best medical care will fail to have the desired outcome if it arrives after a disease has become too advanced. In FY 2010, NIBIB will support research proposals that address new techniques to image diseased tissue with sensitivity and selectivity that permits identification of cancer or other diseases at the molecular or cellular level before clinical symptoms appear. This ‘molecular imaging’ technology targets the early disease processes, from cancer to heart disease, making treatment more effective and available much earlier than currently possible. The possibility of combining molecular diagnostics with therapy, “theranostics”, represents the next frontier in a targeted approach for disease diagnosis and treatment.

Early identification of disease is necessary but not sufficient to transform the outcome for a patient. Equally important is the ability to treat disease exactly where it occurs. The use of real-time imaging to plan and precisely execute surgical and minimally-invasive procedures is an area of great promise. In FY 2010, NIBIB plans to advance the current state-of-the-technology on minimally-invasive image-guided interventions (IGI) that are faster, safer, and less expensive than traditional approaches. In the next phase of this program, we plan to focus on clinical applications of IGI technologies.

The cost of health care has been increasing in the U.S. In FY 2009 NIBIB is partnering with professional organizations to hold a summit to discuss duplicative and/or unnecessary imaging orders in hospitals. NIBIB is also partnering with industry, academia, and professional organizations to support research on internet-based patient-controlled sharing of clinical or research images across hospitals and across the country in a secure environment that provides image information to the physician while maintaining patient privacy. Biomedical informatics is an important component of the NIBIB research portfolio as it provides tools that enable data sharing and interoperability of databases. Another approach to addressing health care costs reduction is to provide evidence of the comparative effectiveness of various technologies to diagnose or treat disease. We plan to support technology assessment studies to identify technologies that are cost-effective and produce optimal outcomes.

The return of U.S. military personnel from active duty abroad has created an immediate need to address combat injuries. NIBIB is leading a group of three NIH Institutes working in conjunction with the Department of Defense on the development of the Armed Forces Institute of Regenerative Medicine (AFIRM). AFIRM is dedicated to repairing battlefield injuries through regenerative medicine.

A central theme of the research approaches described above is the integration of physical and life sciences. NIBIB reinforces this important theme by giving special consideration to grant applicants who conduct research at the nexus of the life, physical, and quantitative sciences. NIBIB continues to support the Bioengineering Research Partnership Grants that partner a biomedical engineer with a clinical or life scientist to tackle a biological or medical research question.

Overall Budget Policy: NIBIB has adopted a funding policy that gives special consideration to grant applications that bridge and integrate the life and physical sciences. NIBIB will also focus on enhancing support for new investigators.

Justification of the FY 2010 Budget by Activity Detail

Program Descriptions and Accomplishments

Applied Science and Technology (AST): This program supports the development and application of new biomedical imaging and bioengineering devices and the enhancement of existing imaging and bioengineering modalities. The promise of these efforts is earlier diagnosis, better management of chronic diseases, and more effective treatment of acute disorders. The program also supports the feasibility testing and validation of novel biomedical imaging and health care technologies. Research is supported through grants, cooperative agreements, and research and development contracts. Upon development and validation, these technologies are integrated into specific clinical applications in collaboration with disease-specific NIH Institutes.

NIBIB is currently supporting an initiative in image-guided interventions. The research aims to develop new approaches to biopsy and surgical treatment that are image guided and thus are more precise and less invasive than current procedures. AST is

also supporting an initiative to develop and accelerate the implementation of innovative ultrasound technologies that have traditionally been used for diagnostics but have the potential to enhance, or provide new therapeutic approaches. Projects funded through this initiative could provide novel treatments for tumors, stroke, coronary thrombosis, neurodegeneration and other important diseases. Finally, AST is supporting a new initiative that will encourage the development of novel molecular imaging approaches to probe physiological and biological processes and disease mechanisms in order to detect disease early and to develop "theranogstics" for combining treatment with diagnosis and detection.

Budget Policy: The FY 2010 budget estimate for the AST program is $164.471 million, a $1.758 million increase (1.1%) over the FY 2009 estimate. Highest priority is given to new investigators, early career investigators, and research initiatives that bridge the physical and life sciences. High priority will be given to molecular imaging, image-guided interventions, and investigator-initiated research - including exploratory research grants and Bioengineering Research Partnerships.

Program Portrait: New Technologies for Clinical Molecular Imaging Applications

FY 2010 Level $24.700 million
FY 2009 Level: $24.300 million
Change: +$0.400 million

An important goal of medical research is developing novel imaging techniques to detect and characterize disease where treatment can be most effective - at an early stage. Early detection does not occur in standard radiological imaging because the techniques are not sensitive to the subtle biochemical and physiological changes that take place early in disease. These early changes can be detected by novel "molecular imaging" approaches. To date, most of the approaches have been developed for use in small animals, and are difficult to extend to humans. Extending these applicable technologies to human medicine is an important component of NIBIB's research portfolio.

The NIBIB supports a number of research teams that are developing novel molecular imaging and engineering approaches for human clinical studies. One example involves "theranostics" – the use of molecular imaging approaches to visualize and guide the targeted delivery of therapeutic agents to specific disease sites, e.g., tumors. Theranostics can enhance treatment efficacy by reducing dosage while minimizing systemic circulation of toxic compounds through healthy tissue. Another research project is making highly specific, dye-loaded nanoparticles capable of delivering targeted photosensitizers to improve the survival of brain tumor patients. Patients will have tumor cells nanolabelled with dye which will allow surgeons to visualize the margins of brain tumors for maximal removal of the bulk tumor. The remaining tumor cells will be killed through a process known as photodynamic therapy. Other theranostic-type research projects include *(i)* nanostructured, optical probes and multifunctional, targeted drug delivery systems that control the delivery and release of therapeutic agents, and *(ii)* photoactivable probes that can be used for cellular diagnostics and therapeutics due to their ability to convert optical energy into heat and ultimately kill deleterious cells.

Preliminary results from these approaches strongly suggest that they can be used to target treatment of diseases at an early stage, thus substantially improving the effectiveness of treatments.

Discovery Science and Technology (DST): This program supports the development of innovative biomedical engineering and imaging technologies and related research in the biological, engineering, physical, computational, and mathematical sciences. The

DST program portfolio is broad in scope and includes innovative and revolutionary research focused on the development of new technologies in the areas of biomaterials; biomedical informatics; biomechanics; drug and gene delivery devices; image processing; visual perception and display; mathematical modeling; simulation and analysis; medical devices and implant science; molecular imaging agents; nanotechnology; rehabilitation engineering; sensors and microsystems; surgical tools, techniques, and systems; telehealth; and tissue engineering. Research in the DST program is supported by investigator-initiated grants, contracts, and cooperative agreements.

Budget Policy: The FY 2010 budget estimate for the DST program is $96.139 million, a $1.059 million increase (1.1%) over the FY 2009 estimate. DST will give the highest priority to supporting new and early-career investigators. Priority will be given to investigator-initiated research grants as this is the foundation on which future advances in new biomedical technologies and improved patient care will be developed. Large grants and Center programs will continue to receive support as will investment in other scientific opportunities and high priority areas. The research program in biomedical informatics will receive increased resources.

Program Portrait: Predictive Models for Understanding Health and Disease

FY 2010 Level: $5.900 million
FY 2009 Level: $5.800 million
Change: +$0.100 million

Computational models provide the tools for predictive, preemptive, and personalized (PPP) medicine. These PPP medicine models utilize biological, physiological, mathematical, and clinical research to simulate disease conditions and predict how, when, and in whom diseases will develop. Disease models can be personalized for the individual (e.g. based on a person's medical history, environment, and genetic makeup) to provide treatment for the particular circumstances of the individual. Beyond the individual's immediate circumstance, models can also investigate the impact of potential harmful conditions and can help create solutions to preempt diseases before symptoms and damage occurs. The use of models for research and clinical practice embodies the philosophy of a proactive approach in designing research experiments or providing clinical decision support.

The NIBIB mathematical modeling program currently supports 14 research teams. Examples include:

- models to support personalized drug therapy and dosing;
- models to predict the operation of shunts in hydrocephalous patients;
- biomechanical models of obese subjects and the impact of obesity on motor injuries;
- models to understand patellofemoral pain;
- models to understand conditions surrounding aneurysms;
- models of sleep patterns, and;
- models of an AIDS epidemic.

The NIBIB research effort is integrated with a larger interagency federal research program, The Interagency Modeling and Analysis Group (IMAG). IMAG is lead by NIBIB.

Technological Competitiveness - Bridging the Sciences: This program has two principal aims. The first is to develop an interdisciplinary environment for training physical and life scientists and engineers to conduct research at the interface of the

biological and physical sciences. The second aim is to develop multi-disciplinary research programs and environments to bring scientists and engineers from the biological and physical sciences together to address biomedical and health- related questions. This unites the needed expertise and knowledge from many disciplines to solve problems related to improving human health. The Howard Hughes Medical Institute (HHMI)-NIBIB Interfaces Initiative, a public-private partnership, is an example of interdisciplinary training. NIBIB has launched several efforts to address technological competitiveness. The Quantum Grant program seeks to accelerate the application of innovative biomedical technologies to the national health care system with the goal of reducing the burden of a major disease or public health problem. Bioengineering Research Partnerships partner an engineer with a life scientist to approach a problem that neither could address alone. An NIBIB-led interagency program on bridging the sciences is identifying demonstration projects to explore new approaches to bridging the biological, computational, and physical science. In this endeavor we are working cooperatively with other NIH Institute and Centers, Federal agencies, and private organizations.

Budget Policy: The FY 2010 budget estimate for the Technological Competitiveness – Bridging the Sciences program is $24.281 million, a $1.210 million increase (5.3%) over the FY 2009 estimate. High priorities in FY 2010 include developing interdisciplinary training programs such as Phase II of the HHMI-NIBIB Interfaces Initiative and continued support for the Quantum Grant program.

Program Portrait: The Quantum Grants Program

FY 2010 Level: $6.000 million
FY 2009 Level: $5.000 million
Change: +$1.000 million

NIBIB Quantum grants are designed to profoundly improve the detection, diagnosis, prevention or treatment of a major disease or national public health problem with new technologies. This year, the Quantum Grant program begins its second phase. This phase will emphasize on the accelerated translation of early phase results to achieve a first-in-human demonstration in an ambitious five-year period. The phase two program will be interdisciplinary, milestone driven, multi-organizational, and cooperatively managed. Phase two will support multiple high-risk projects that share the potential to have a profound impact.

Examples of the profound impacts that could be achieved are to:

- Develop an implantable artificial kidney that could eliminate the need for dialysis.
- Develop pancreatic islet replacement cells with the goal of eliminating the need for insulin use in diabetes.
- Detect individual metastatic lung cancer cells as they circulate in the blood to prevent the development of metastatic disease.
- Fully remove inoperable brain tumors with light-activated nanotechnology.
- Develop engineered brain tissue to serve as a source of neural and vascular cells, leading to the repair of stroke-injured tissue.

Intramural Research: The Intramural Program supports the mission to integrate bioengineering with the life and physical sciences and develops new technologies ranging in scale from near atomic to intact organisms. Interdisciplinary training opportunities will be supported for both clinical and basic scientists through a variety of NIH programs as well as inter-agency programs. The Intramural Program is expanding our research activity in Positron Emission Tomography (PET) Radiochemistry Program. This program provides exciting opportunities to expand the development of innovative molecular imaging probes to diagnose early stages of cancer and other disease. Emphasis will be placed on achieving high sensitivity and specificity through advances in targeting, delivery, and nanomedicine.

NIBIB is leading a trans-NIH activity in molecular imaging. This will be important in discovering fundamental molecular mechanisms relevant to obesity, cancer, brain development and function of the immune system.

Budget Policy: The FY 2010 budget estimate for the Intramural Research Program is $11.077 million, a $0.164 million increase (1.5%) over the FY 2009 estimate.

Research Management and Support (RMS): NIBIB RMS activities provide administrative, budgetary, logistical, and scientific support in the review, award, and monitoring of research grants, training awards and research and development contracts. RMS functions also encompass strategic planning, coordination, and evaluation of the Institute's programs, regulatory compliance, international coordination, and liaison with other Federal agencies, Congress, and the public.

Budget Policy: The FY 2010 budget estimate for RMS is $16.719 million, a $0.288 million increase (1.8%) over the FY 2009 estimate. This increase reflects NIH policy for RMS in FY 2010 and will be used to help offset increases for pay costs, centrally furnished services, and supplies and materials.

NATIONAL INSTITUTES OF HEALTH
National Institute of Biomedical Imaging and Bioengineering

Budget Authority by Object

	FY 2009 Estimate	FY 2010 Estimate	Increase or Decrease
Total compensable workyears:			
Full-time employment	86	88	2
Full-time equivalent of overtime and holiday hour	0	0	0
Average ES salary	$0	$0	$0
Average GM/GS grade	12.7	12.7	0.0
Average GM/GS salary	$103,774	$106,571	$2,797
Average salary, grade established by act of July 1, 1944 (42 U.S.C. 207)	$103,774	$106,571	$2,797
Average salary of ungraded positions	127,975	131,814	3,839

OBJECT CLASSES	FY 2009 Estimate	FY 2010 Estimate	Increase or Decrease
Personnel Compensation:			
11.1 Full-time permanent	$5,660,000	$6,046,000	$386,000
11.3 Other than full-time permanent	1,601,000	1,724,000	123,000
11.5 Other personnel compensation	184,000	196,000	12,000
11.7 Military personnel	0	0	0
11.8 Special personnel services payments	516,000	572,000	56,000
Total, Personnel Compensation	7,961,000	8,538,000	577,000
12.0 Personnel benefits	1,797,000	1,925,000	128,000
12.2 Military personnel benefits	0	0	0
13.0 Benefits for former personnel	0	0	0
Subtotal, Pay Costs	**9,758,000**	**10,463,000**	**705,000**
21.0 Travel and transportation of persons	408,000	380,000	(28,000)
22.0 Transportation of things	20,000	18,000	(2,000)
23.1 Rental payments to GSA	11,000	10,000	(1,000)
23.2 Rental payments to others	66,000	66,000	0
23.3 Communications, utilities and miscellaneous charges	88,000	80,000	(8,000)
24.0 Printing and reproduction	23,000	21,000	(2,000)
25.1 Consulting services	280,000	270,000	(10,000)
25.2 Other services	2,945,000	2,825,000	(120,000)
25.3 Purchase of goods and services from government accounts	21,759,000	21,777,000	18,000
25.4 Operation and maintenance of facilities	2,805,000	2,791,000	(14,000)
25.5 Research and development contracts	3,963,000	4,082,000	119,000
25.6 Medical care	0	0	0
25.7 Operation and maintenance of equipment	344,000	341,000	(3,000)
25.8 Subsistence and support of persons	0	0	0
25.0 Subtotal, Other Contractual Services	**32,096,000**	**32,086,000**	**(10,000)**
26.0 Supplies and materials	562,000	552,000	(10,000)
31.0 Equipment	831,000	816,000	(15,000)
32.0 Land and structures	0	0	0
33.0 Investments and loans	0	0	0
41.0 Grants, subsidies and contributions	264,345,000	268,195,000	3,850,000
42.0 Insurance claims and indemnities	0	0	0
43.0 Interest and dividends	0	0	0
44.0 Refunds	0	0	0
Subtotal, Non-Pay Costs	**298,450,000**	**302,224,000**	**3,774,000**
Total Budget Authority by Object	**308,208,000**	**312,687,000**	**4,479,000**

Includes FTEs which are reimbursed from the NIH Roadmap for Medical Research

NATIONAL INSTITUTES OF HEALTH
National Institute of Biomedical Imaging and Bioengineering

Salaries and Expenses

OBJECT CLASSES	FY 2009 Estimate	FY 2010 Estimate	Increase or Decrease
Personnel Compensation:			
Full-time permanent (11.1)	$5,660,000	$6,046,000	$386,000
Other than full-time permanent (11.3)	1,601,000	1,724,000	123,000
Other personnel compensation (11.5)	184,000	196,000	12,000
Military personnel (11.7)	0	0	0
Special personnel services payments (11.8)	516,000	572,000	56,000
Total Personnel Compensation (11.9)	**7,961,000**	**8,538,000**	**577,000**
Civilian personnel benefits (12.1)	1,797,000	1,925,000	128,000
Military personnel benefits (12.2)	0	0	0
Benefits to former personnel (13.0)	0	0	0
Subtotal, Pay Costs	**9,758,000**	**10,463,000**	**705,000**
Travel (21.0)	408,000	380,000	(28,000)
Transportation of things (22.0)	20,000	18,000	(2,000)
Rental payments to others (23.2)	66,000	66,000	0
Communications, utilities and miscellaneous charges (23.3)	88,000	80,000	(8,000)
Printing and reproduction (24.0)	23,000	21,000	(2,000)
Other Contractual Services:			
Advisory and assistance services (25.1)	280,000	270,000	(10,000)
Other services (25.2)	2,945,000	2,825,000	(120,000)
Purchases from government accounts (25.3)	11,129,000	11,113,000	(16,000)
Operation and maintenance of facilities (25.4)	2,805,000	2,791,000	(14,000)
Operation and maintenance of equipment (25.7)	344,000	341,000	(3,000)
Subsistence and support of persons (25.8)	0	0	0
Subtotal Other Contractual Services	**17,503,000**	**17,340,000**	**(163,000)**
Supplies and materials (26.0)	562,000	552,000	(10,000)
Subtotal, Non-Pay Costs	18,670,000	18,457,000	(213,000)
Total, Administrative Costs	**28,428,000**	**28,920,000**	**492,000**

NATIONAL INSTITUTES OF HEALTH
National Institute of Biomedical Imaging and Bioengineering

Authorizing Legislation

	PHS Act/ Other Citation	U.S. Code Citation	2009 Amount Authorized	FY 2009 Enacted	2010 Amount Authorized	FY 2010 Estimate
Research and Investigation	Section 301	42§241	Indefinite	$308,208,000	Indefinite	$312,687,000
	Section 402(a)	42§281	Indefinite		Indefinite	
National Institute of Biomedical Imaging and Bioengineering						
Total, Budget Authority				308,208,000		312,687,000

NATIONAL INSTITUTES OF HEALTH
National Institute of Biomedical Imaging and Bioengineering

Appropriations History

Fiscal Year	Budget Estimate to Congress	House Allowance	Senate Allowance	Appropriation 1/
2002	40,206,000 2/	39,869,000	140,000,000	111,984,000
Rescission				(33,000)
2003	120,502,000	270,494,000	283,100,000	280,100,000
Rescission				(1,821,000)
2004	282,109,000	282,109,000	289,300,000	288,900,000
Rescission				(1,771,000)
2005	297,647,000	297,647,000	300,800,000	300,647,000
Rescission				(2,438,000)
2006	299,808,000	299,808,000	309,091,000	299,808,000
Rescission				(2,998,000)
2007	296,810,000	294,850,000	297,606,000	296,887,000
Rescission				0
2008	300,463,000	303,318,000	304,319,000	303,955,000
Rescission				(5,310,000)
Supplemental				1,588,000
2009	300,254,000	310,513,000	307,254,000	308,208,000
Rescission				0
2010	312,687,000			

1/ Reflects enacted supplementals, rescissions, and reappropriations.
2/ Excludes funds for HIV/AIDS research activities consolidated in the NIH Office of AIDS Research.

NATIONAL INSTITUTES OF HEALTH

National Institute of Biomedical Imaging and Bioengineering

Details of Full-Time Equivalent Employment (FTEs)

OFFICE/DIVISION	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
Office of the Director	6	6	6
Extramural Science Program	19	20	21
Office of Research Administration	17	17	17
Office of Administration Management	17	17	17
Intramural Science Program	26	26	27
Total	85	86	88
Includes FTEs which are reimbursed from the NIH Roadmap for Medical Research			
FTEs supported by funds from Cooperative Research and Development Agreements	(0)	(0)	(0)

FISCAL YEAR	Average GM/GS Grade
2006	12.5
2007	12.4
2008	12.7
2009	12.7
2010	12.7

NATIONAL INSTITUTES OF HEALTH
National Institute of Biomedical Imaging and Bioengineering

Detail of Positions

GRADE	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
Total, ES Positions			
Total, ES Salary			
GM/GS-15	10	10	10
GM/GS-14	23	23	23
GM/GS-13	13	14	16
GS-12	7	7	7
GS-11	3	3	3
GS-10	1	1	1
GS-9	7	7	7
GS-8	1	1	1
GS-7	1	1	1
GS-6			
GS-5	1	1	1
GS-4			
GS-3			
GS-2			
GS-1			
Subtotal	67	68	70
Grades established by Act of July 1, 1944 (42 U.S.C. 207):			
Assistant Surgeon General			
Director Grade			
Senior Grade			
Full Grade			
Senior Assistant Grade			
Assistant Grade			
Subtotal	0	0	0
Ungraded	25	25	25
Total permanent positions	64	65	67
Total positions, end of year	92	93	95
Total full-time equivalent (FTE) employment, end of year	85	86	88
Average ES salary			
Average GM/GS grade	12.7	12.7	12.7
Average GM/GS salary	99,080	103,774	106,571

Includes FTEs which are reimbursed from the NIH Roadmap for Medical Research.

NATIONAL INSTITUTES OF HEALTH
National Institute of Biomedical Imaging and Bioengineering

New Positions Requested

	FY 2010		
	Grade	Number	Annual Salary
Health Science Administrator	13	1	$101,000
Senior Scientist	13	1	$101,000
Total Requested		2	