

DEPARTMENT OF HEALTH AND HUMAN SERVICES

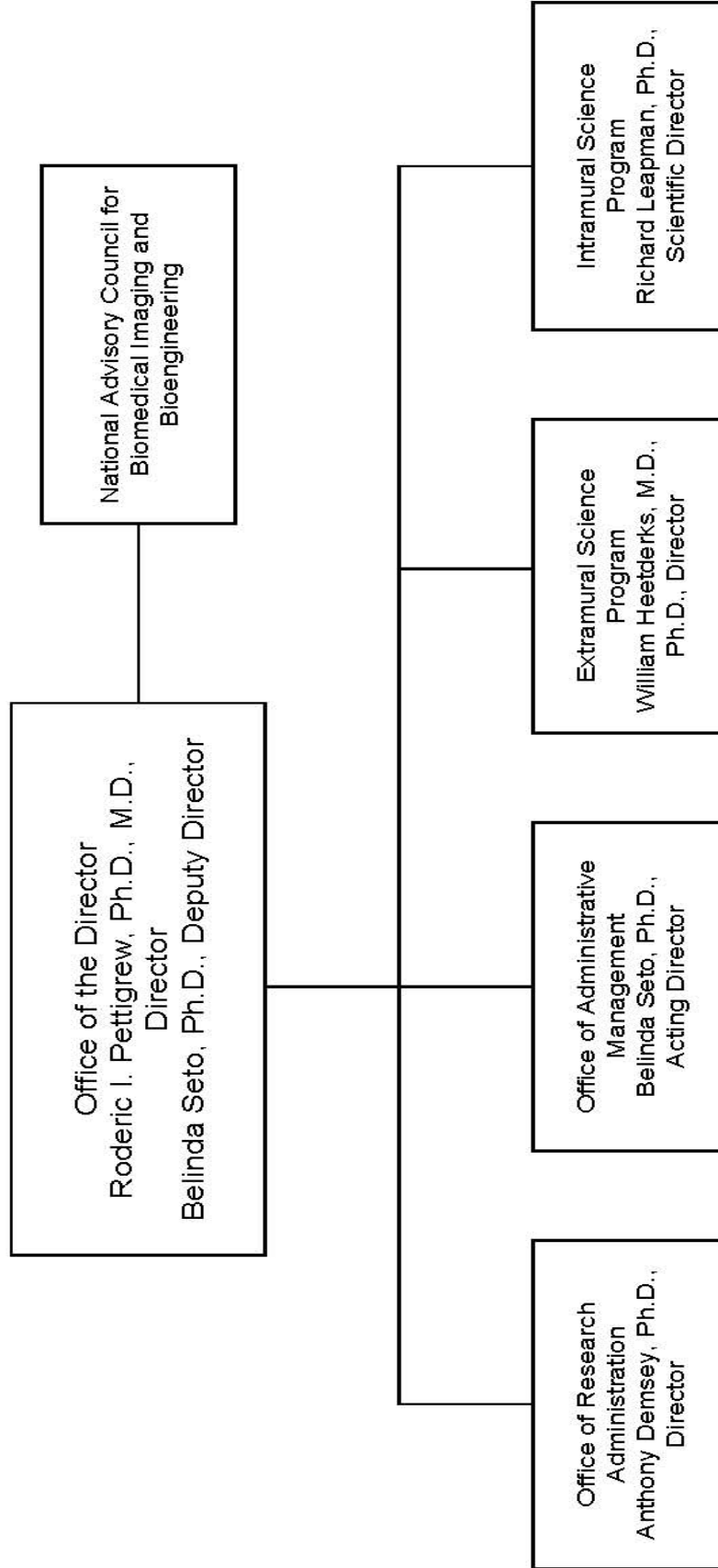
NATIONAL INSTITUTES OF HEALTH

National Institute of Biomedical Imaging and Bioengineering

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NIBIB ORGANIZATIONAL CHART



FY 2009 Proposed Appropriation Language

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, [~~\$303,955,000~~] **\$300,254,000** (Department of Health and Human Services Appropriations Act, 2008)

**National Institutes of Health
National Institute of Biomedical Imaging and Bioengineering**

Amounts Available for Obligation 1/

Source of Funding	FY 2007 Actual	FY 2008 Enacted	FY 2009 Estimate
Appropriation	\$296,810,000	\$303,955,000	\$300,254,000
Pay cost add-on	77,000	0	0
Rescission	0	-5,310,000	0
Subtotal, adjusted appropriation	296,887,000	298,645,000	300,254,000
Real transfer under Director's one-percent transfer authority (GEI)	-507,000	0	0
Comparative transfer to NIBIB	1,528,000	0	0
Comparative transfer to OD	-3,000	0	0
Comparative transfer to NCRR	-21,000	0	0
Comparative transfer under Director's one-percent transfer authority (GEI)	507,000	0	0
Subtotal, adjusted budget authority	298,391,000	298,645,000	300,254,000
Unobligated balance, start of year	0	0	0
Unobligated balance, end of year	0	0	0
Subtotal, adjusted budget authority	298,391,000	298,645,000	300,254,000
Unobligated balance lapsing	0	0	0
Total obligations	298,391,000	298,645,000	300,254,000

1/ Excludes the following amounts for reimbursable activities carried out by this account:
FY 2007 - \$4,038,000 FY 2008 - \$5,575,000 FY 2009 - \$5,575,000

NATIONAL INSTITUTES OF HEALTH
National Institute of Biomedical Imaging and Bioengineering
(Dollars in Thousands)

Budget Mechanism - Total

MECHANISM	FY 2007 Actual		FY 2008 Enacted		FY 2009 Estimate		Change	
	No.	Amount	No.	Amount	No.	Amount	No.	Amount
Research Grants:								
<u>Research Projects:</u>								
Noncompeting	398	\$134,337	422	\$148,648	409	\$153,039	(13)	\$4,391
Administrative supplements	(13)	851	(5)	851	(5)	851	(0)	0
Competing:								
Renewal	36	15,133	27	11,273	24	9,893	(3)	-1,380
New	208	65,001	154	48,058	135	42,178	(19)	-5,880
Supplements	0	0	0	700	0	700	0	0
Subtotal, competing	244	80,134	181	60,031	159	52,771	(22)	-7,260
Subtotal, RPGs	642	215,322	603	209,530	568	206,661	(35)	-2,869
SBIR/STTR	46	7,543	46	7,366	46	7,341	0	-25
Subtotal, RPGs	688	222,865	649	216,896	614	214,002	(35)	-2,894
<u>Research Centers:</u>								
Specialized/comprehensive	5	7,561	5	7,611	5	7,611	0	0
Clinical research	0	0	0	0	0	0	0	0
Biotechnology	19	19,120	17	17,129	17	17,129	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
Subtotal, Centers	24	26,681	22	24,740	22	24,740	0	0
<u>Other Research:</u>								
Research careers	32	4,298	35	4,765	40	5,215	5	450
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	13	1,170	22	2,016	22	2,016	0	0
Subtotal, Other Research	45	5,468	57	6,781	62	7,231	5	450
Total Research Grants	757	255,014	728	248,417	698	245,973	(30)	-2,444
<u>Research Training:</u>	<u>FTEs</u>		<u>FTEs</u>		<u>FTEs</u>			
Individual awards	36	1,368	41	1,562	41	1,570	0	8
Institutional awards	199	8,820	173	7,661	218	9,699	45	2,038
Total, Training	235	10,188	214	9,223	259	11,269	45	2,046
Research & development contracts (SBIR/STTR)	19 (3)	11,571 (17)	25 (2)	15,512 (18)	25 (2)	15,837 (18)	0 (0)	325 (0)
Intramural research	31	5,793	33	9,431	33	10,872	0	1,441
Research management and support	54	15,825	55	16,062	55	16,303	0	241
Construction		0		0		0		0
Buildings and Facilities		0		0		0		0
Total, NIBIB	85	298,391	88	298,645	88	300,254	0	1,609

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 2005		FY 2006		FY 2007		FY 2007		FY 2008		FY 2009		Change	
	Actual	Actual	Actual	Actual	Actual	Actual	Enacted	Enacted	Estimate	Estimate	Estimate	Estimate		
<u>Detail:</u>	<u>FTEs</u>	<u>Amount</u>	<u>FTEs</u>	<u>Amount</u>	<u>FTEs</u>	<u>Amount</u>	<u>FTEs</u>	<u>Amount</u>	<u>FTEs</u>	<u>Amount</u>	<u>FTEs</u>	<u>Amount</u>	<u>FTEs</u>	<u>Amount</u>
Applied Science and Technology		\$175,656		\$160,734		\$153,819		\$160,082		\$159,443		-\$639		
Discovery Science and Technology		\$91,077		\$100,331		\$100,331		\$90,738		\$90,111		-\$627		
Technological Competitiveness - Bridging the Sciences		\$12,938		\$16,249		\$22,137		\$22,332		\$23,525		\$1,193		
Subtotal, Extramural		279,671		277,314		276,287		273,152		273,079		-73		
Intramural research	5	3,981	5	3,802	5	4,265	33	9,431	33	10,872	0	1,441		
Res. management & support	41	14,557	43	15,490	54	15,828	55	16,062	55	16,303	0	241		
TOTAL	46	298,209	48	296,606	59	296,380	88	298,645	88	300,254	0	1,609		

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

Major Changes in the Fiscal Year 2009 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 2009 budget request for NIBIB, which is +\$1.609 million more than the FY 2008 Enacted, for a total of \$300.254 million.

Research Project Grants (-\$2.9 million, total \$206.7 million): NIBIB will support a total of 568 Research Project Grant (RPG) awards in FY 2009. For noncompeting awards, the number funded will decrease by 13 awards while the funding level increases by \$4.4 million. Competing RPGs will decrease by 22 awards as funding for competing RPGs decreases by \$7.3 million. The NIH budget policy for RPGs in FY 2009 is to provide no inflationary increases in noncompeting awards and no increase in the average cost for competing RPGs. While FY 2009 RPGs reflect a net decrease due to major changes in other mechanisms of support – as well as a modest increase in Research Management and Support to help offset pay and other increases – NIBIB remains committed to supporting new investigators and funding an adequate number of competing RPGs.

Research Training (+\$2.0 million; total \$11.3 million): Funding will support NIBIB's commitment to competitively fund Phase II of the high priority Howard Hughes Medical Institute (HHMI)-NIBIB Interfaces Initiative. HHMI funded Phase I awards. Also in FY 2009, all predoctoral and postdoctoral NRSA trainees will receive a 1% stipend increase.

Technological Competitiveness - Bridging the Sciences (+\$1.2 million; total \$23.5 million): As the Research Training Mechanism comprises a large portion of this program, the above explanation of the increase for that mechanism equally applies to this program. Partially offsetting the increase for Research Training is the decrease in funding for Quantum Grants, with one Phase I award ending in FY 2008.

Intramural Research (+\$1.4 million; total \$10.9 million): This increase includes funding for a new intramural research laboratory aimed at translational radiologic research, and funding 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
Summary of Changes

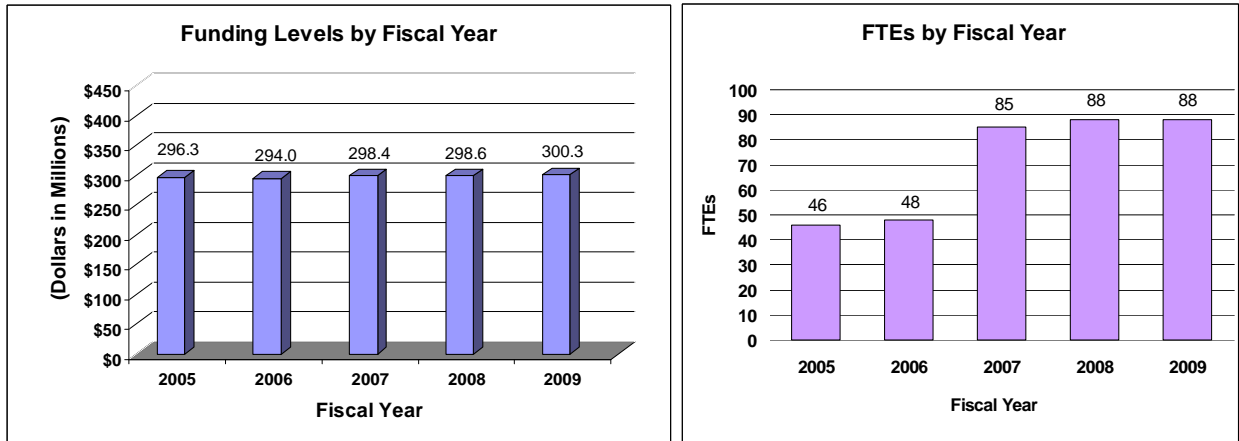
FY 2008 enacted		\$298,645,000	
FY 2009 estimated budget authority		300,254,000	
Net change		1,609,000	
CHANGES	FY 2008 Enacted Base		Change from Base
	FTEs	Budget Authority	FTEs Budget Authority
A. Built-in:			
1. Intramural research:			
a. Annualization of January 2008 pay increase			
		\$1,849,000	\$20,000
b. January FY 2009 pay increase			
		1,849,000	42,000
c. One less day of pay			
		1,849,000	(7,000)
d. Payment for centrally furnished services			
		1,034,000	16,000
e. Increased cost of laboratory supplies, materials, and other expenses			
		6,548,000	131,000
Subtotal			202,000
2. Research management and support:			
a. Annualization of January 2008 pay increase			
		\$7,112,000	\$78,000
b. January FY 2009 pay increase			
		7,112,000	162,000
c. One less day of pay			
		7,112,000	(28,000)
d. Payment for centrally furnished services			
		3,377,000	52,000
e. Increased cost of laboratory supplies, materials, and other expenses			
		5,573,000	107,000
Subtotal			371,000
Subtotal, Built-in			573,000

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

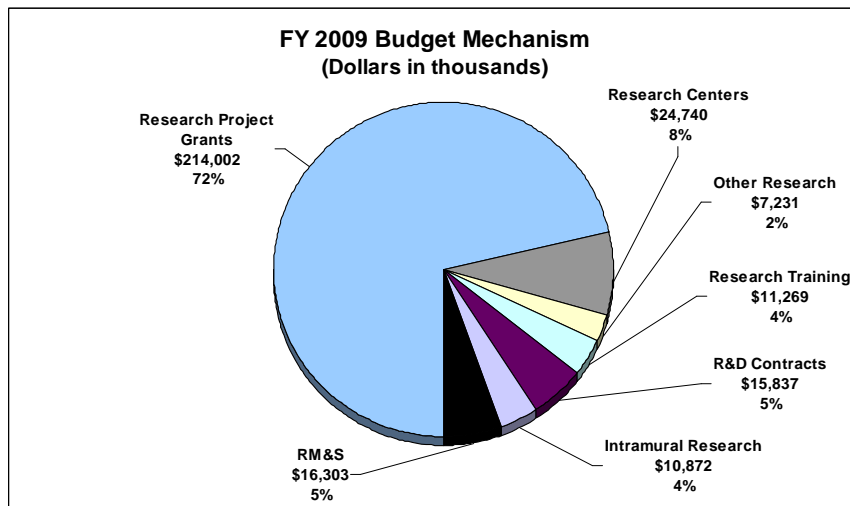
CHANGES	FY 2008 Enacted Base		Change from Base	
	No.	Amount	No.	Amount
B. Program:				
1. Research project grants:				
a. Noncompeting	422	\$149,499,000	(13)	\$4,391,000
b. Competing	181	60,031,000	(22)	(7,260,000)
c. SBIR/STTR	46	7,366,000	0	(25,000)
Total	649	216,896,000	(35)	(2,894,000)
2. Research centers	22	24,740,000	0	0
3. Other research	57	6,781,000	5	450,000
4. Research training	214	9,223,000	45	2,046,000
5. Research and development contracts	25	15,512,000	0	325,000
Subtotal, extramural				(73,000)
	<u>FTEs</u>		<u>FTEs</u>	
6. Intramural research	33	9,431,000	0	1,239,000
7. Research management and support	55	16,062,000	0	(130,000)
Subtotal, program		298,645,000		1,036,000
Total changes	88		0	1,609,000

Fiscal Year 2009 Budget Graphs

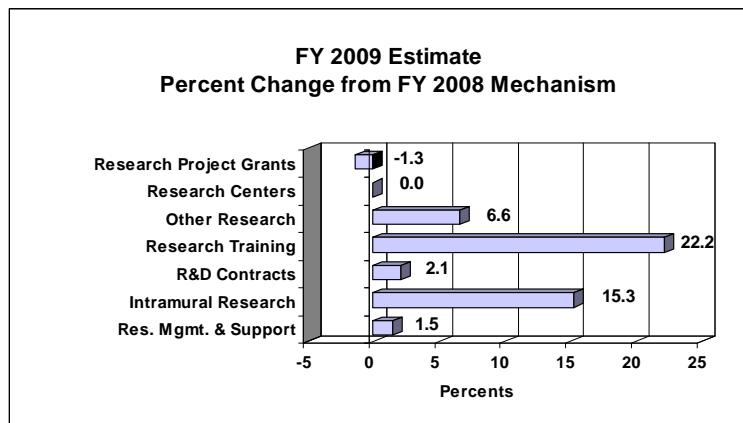
History of Budget Authority and FTEs:



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.

Budget Authority:

FY 2007 Actual		FY 2008 Enacted		FY 2009 Estimate		Increase or Decrease	
<u>FTE</u>	<u>BA</u>	<u>FTE</u>	<u>BA</u>	<u>FTE</u>	<u>BA</u>	<u>FTE</u>	<u>BA</u>
82	\$298,391,000	88	\$298,645,000	88	\$300,254,000	0	1,609,000

This document provides justification for the Fiscal Year (FY) 2009 activities of the National Institute of Biomedical Imaging and Bioengineering (NIBIB), including HIV/AIDS activities. Details of the FY 2009 HIV/AIDS activities are in the “Office of AIDS Research (OAR)” Section of the Overview. Details on the Common Fund are located in the Overview, Volume One. Program funds are allocated as follows: Competitive Grants/Cooperative Agreements; Contracts; Direct Federal/Intramural and Other.

Director’s Overview

The mission of the National Institute of Biomedical Imaging and Bioengineering (NIBIB) is to improve human health by leading the development and accelerating the application of biomedical technologies. NIBIB is the newest of the NIH Institutes, having recently celebrated its fifth anniversary, and fills a unique niche at NIH with its technological focus. An important component of the Institute's stewardship involves strategic planning to identify research areas and training opportunities that NIBIB is uniquely positioned to address. In collaboration with other NIH Institutes and other Federal and non-Federal partners, NIBIB is committed to pursuing high-priority initiatives linked to national needs as outlined in our Strategic Plan.

NIBIB was created specifically to bridge the physical and the life sciences to improve human health, and several important actions have been taken by NIBIB in support of this mission. NIBIB led a multi-agency “Conference on Research at the Interface of the Life and Physical Sciences: Bridging the Sciences.” Subsequently, NIBIB adopted a policy to give special consideration to grant applicants that conduct research at the nexus of the life and quantitative sciences. The NIH Reform Act of 2006 charged NIH with identifying and developing demonstration projects specifically at the interface of the life and physical sciences to benefit the nation’s health care. In FY 2007, NIBIB took the lead to jointly develop such interdisciplinary projects with the National Science Foundation and the Department of Energy.

NIBIB demonstrated its commitment to integrate the physical and life sciences by releasing a second Request for Applications for its innovative Quantum Grant (QG)

program. An elite group of researchers funded under this program has been selected for large-scale, interdisciplinary research projects aimed at developing technologies that will realize substantial advances in the preemptive treatment of diabetes, stroke, and kidney failure; as well as the early detection and personalized treatment of brain and lung cancers.

Recently, the return of United States military personnel from active duty abroad has created an urgent 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 the use of regenerative medicine. This discipline offers approaches for the treatment of damaged tissues or organs by using personalized therapies that prompt the self-regenerative capacity of the body and by integrating cells with biomaterials for the creation of engineered tissues or organs for therapy. Technologies and therapies developed through this program for the military will be translated into applications for the civilian population as well.

The use of real-time imaging to help plan and more precisely execute surgical and minimally invasive procedures is a new area of great promise. In FY 2007, NIBIB launched an initiative with the National Cancer Institute to develop technologies for Image-Guided Interventions (IGI). The purpose of the initiative is to replace invasive treatments with minimally invasive IGI techniques that are faster, safer, and less expensive than traditional, more invasive approaches. This program leverages the work NIBIB already supports to develop faster and more interactive 3-D images using MRI, x-ray, ultrasound, and nuclear technologies, which further enable predictive medicine.

As part of our commitment to improving healthcare accessibility, NIBIB supports the development of technologies that enable delivering diagnostic services at the time of initial doctor contact or the “point-of-care” (POC). In FY 2007, NIBIB launched an initiative to establish a POC Technologies Research Network. The goals of this initiative are to bridge the gap between technology development and translation to the clinic, and to provide the foundation for the application of technologies such as lab-on-a-chip devices, noninvasive monitoring, and imaging technologies. The centers comprising the network are structured around themes that link promising technologies with clinical needs and opportunities to enhance the development of participatory, preemptive medicine. Some examples include primary care, home healthcare, emergency medicine, and healthcare for underserved rural populations. More information about this initiative can be found in the Program Portrait.

In FY 2007, NIBIB entered into a bilateral agreement with the Department of Biotechnology (DBT) of the Ministry of Science and Technology of the Republic of India to develop low-cost healthcare technologies aimed at the medically underserved. The agreement is based on a shared commitment to improve the health and well-being of the people of both India and the United States. The agreement further underscores our commitment to the promise of POC technologies and the impact they can have in addressing global health disparities to diagnose and treat illness and injury across

geographic and economic borders. In FY 2008, NIBIB and the DBT will hold workshops and meetings to link appropriate Centers of Excellence and NIH Institutes; engage in bilateral cooperation on the assessment and application of new diagnostic technologies; and generate collaborations among scientists and engineers, and facilitate collaborative research training, and technology development.

Going forward, a principal challenge will be to support new and promising science with resources for which competition continues to increase. Through FY 2009, NIBIB plans to give special emphasis to those areas of technology that have the greatest promise of making a positive impact on the lives of all of our citizens. These plans include further development of POC technologies; optical imaging; nanomedicine; and greater clinical translation of minimally invasive robotic assisted IGI technologies. Because addressing health disparities is critical to improving the nation's health, NIBIB is collaborating with the National Center on Minority Health and Health Disparities (NCMHD) on a Small Business Innovation Research initiative for new technologies to reduce health disparities. NIBIB will also continue to support and expand utilization of the most advanced imaging technologies in the Jackson Heart Study, jointly funded with the National Heart Lung and Blood Institute and NCMHD.

The NIBIB participates in the support of the following initiatives funded through the NIH Common Fund: Molecular Libraries and Imaging, Interdisciplinary Research, Epigenomics, and Bioinformatics and Computational Biology.

Justification of the FY 2009 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 disease, 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 that aspires 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.

Budget Policy: The FY 2009 budget estimate for the AST program is \$159.4 million, a \$0.6 million decrease (-0.4%) from the FY 2008 estimate. AST will continue to support research for image-guided interventions and innovative therapeutic ultrasound

technologies. High priority will also continue to be given in FY 2009 to funding investigator-initiated research including exploratory research grants and Bioengineering Research Partnerships. The highest priority is given to new investigators and to research initiatives that bridge the physical and life sciences. While maintaining a strong commitment for the AST program in FY 2009, a portion of these resources has been shifted to other high priority programs in FY 2009.

Program Portrait: New Technologies for Clinical Molecular Imaging Applications

FY 2009 Level: \$24.3 million

FY 2008 Level: \$24.2 million

Change: +\$0.1 million

An important goal of medical research is the development of novel imaging techniques to detect and characterize disease at an early stage, where treatment can be most effective. The problem is that standard radiological imaging techniques are not sensitive to the subtle biochemical and physiological changes that take place early in disease. While novel “molecular imaging” approaches can detect these subtle changes, most of the approaches are for use in small animals and are difficult to extend to humans. Filling this void of applicable technologies is an important component of NIBIB’s research portfolio.

This program supports approximately two dozen research teams to develop novel molecular imaging approaches for clinical studies of human patients. One approach involves “tracking” immune cells as they migrate to different regions of the body. This approach could allow early diagnosis of autoimmune diseases such as type 1 diabetes. Another involves imaging the “expression” of specific genes that are characteristic for early stages of disease. These approaches may allow clinicians to take advantage of the large number of new genomic “targets” that are being identified for specific diseases, such as atherosclerosis and cancer. Finally, a third study involves the development of novel imaging technologies that can provide unique clinical information like the development of “hyperpolarized contrast agent” MRI techniques that are far more sensitive than conventional MRI and could allow early detection of prostate cancer.

Preliminary results from these molecular imaging approaches strongly suggest they can be used clinically to preempt or detect diseases at an early stage where treatment can be more effective.

Discovery Science and Technology (DST): This program supports the discovery of innovative biomedical engineering and imaging principles and supports related research in the engineering, physical, and mathematical sciences. The DST program leads the development of revolutionary approaches through the advancement and cultivation of new technologies in the areas of biomaterials, biomedical informatics, biomechanics, drug and gene delivery, mathematical modeling, simulation and analysis, molecular imaging agents, platform technologies, sensors, telemedicine, and tissue engineering. Research in the DST program is supported by investigator-initiated grants, contracts, and cooperative agreements.

The program works to harness the synergy that comes from joining together the engineering and physical sciences with the life sciences. This integration will yield new disciplines, new ways of thinking, and stimulate the next generation of researchers to accelerate discovery and technology development. In 2007 NIBIB released a Funding

Opportunity Announcement calling for the development of enabling technologies for tissue engineering.

Budget Policy: The FY 2009 budget estimate for the DST program is \$90.1 million, a \$0.6 million decrease (-0.7%) from the FY 2008 estimate. DST will give the highest priority to supporting investigator-initiated research grants. Particular emphasis will be given to new investigators. Investigator-initiated research is recognized as the foundation on which future advances in new biomedical technologies and improved patient care will be developed. Large grants, such as the Bioengineering Research Partnerships (BRP), and Center programs, such as the Biomedical Technology Resource Centers, will continue to receive support as will investment in other scientific opportunities and high priority areas. Support will also continue for development of point-of-care technologies and enabling technologies for tissue engineering and regenerative medicine. While maintaining a strong commitment for the DST program in FY 2009, a portion of these resources have been shifted to other high priority programs in FY 2009.

Program Portrait: Translation of Point-of-Care Technologies for the Diagnosis and Treatment of Diseases and Conditions

FY 2009 Level: \$17.1 million
FY 2008 Level: \$17.0 million
Change: +\$0.1 million

A significant challenge for the future of healthcare is making predictive, preemptive, preventive and personalized care accessible to everyone. These goals require the ability to provide diagnostic testing and therapy at the point-of-care. The development of low-cost technologies that can easily and reliably be used by a range of healthcare providers or by patients themselves is needed. This Point-of-Care Technologies Research Network can drive the development of appropriate diagnostic technologies through collaborative efforts that merge scientific and technological capabilities with clinical needs.

The research network will address pressing needs in point-of-care testing, such as diagnosis of infectious diseases for global health, detection of pathogens for disaster response and critical care, diagnosis of acute neurological emergencies, and diagnosis of sexually transmitted diseases. The research will also develop reliable and diagnostic tests that can be used by untrained patients in a home care or other primary care setting. The established centers will work together as a network to leverage expertise and to facilitate development of partnerships with industry and clinical research networks. Additionally, the network will provide educational activities to advance evidence-based medical practice in a variety of health care settings.

Technological Competitiveness - Bridging the Sciences: This program has two principal aims. The first is to train scientists and engineers at the interface of the biological and physical sciences in an interdisciplinary environment. This will facilitate the integration of expertise from each of these fields to solve problems related to improving human health. The second aim is to create 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.

The Howard Hughes Medical Institute (HHMI)-NIBIB Interfaces Initiative is focused on the first aim. This initiative commenced in FY 2006, with HHMI awarding Phase I awards to ten interdisciplinary training programs. Phase II of this initiative will be competitively funded by NIBIB beginning in FY 2009 and will sustain outstanding training programs at the interface of the physical and life sciences.

The second aim is being addressed by several efforts. An example is an NIBIB-led interagency program, commenced in 2007, which identifies demonstration projects to explore new approaches to bridging the biological, computational, and physical sciences. In this endeavor we are working cooperatively with other NIH Institutes and Centers, Federal agencies, and private organizations. As another example of fully leveraging the interdisciplinary approach, NIBIB's 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.

Budget Policy: The FY 2009 budget estimate for the Technological Competitiveness – Bridging the Sciences program is \$23.5 million, a \$1.2 million increase (+5.3%) over the FY 2008 estimate. High priorities in FY 2009 include developing interdisciplinary training programs such as the HHMI-NIBIB Interfaces Initiative and continued support for the Quantum Grants Program, which supports the establishment of interdisciplinary research teams to address major health care problems.

Program Portrait: The Quantum Grants Program

FY 2009 Level: \$5.0 million
FY 2008 Level: \$6.3 million
Change: -\$1.3 million

The Quantum Grants program supports multi-organizational, interdisciplinary, large-scale research on targeted projects that will develop new technologies and modalities with the potential impact on the detection, diagnosis, prevention or treatment of a major disease or national public health problem. The concept stems directly from a goal outlined in our inaugural strategic plan entitled “Targeted research programs in areas of special opportunity or need that take advantage of novel technological advances and scientific discoveries.” In these “bench to bedside” partnerships, a team of multidisciplinary scientists will conduct collaborative research that will result in a prototype technology that can be translated into clinical practice in a two-phase approach. Phase I awards are three years in length. One Phase I award was made in FY 2006 and four more were awarded in FY 2007. Phase II, the final phase, commences in FY 2010.

The goals of the Quantum Grants program 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: In October 2006, the NIBIB appointed a Scientific Director to lead the Intramural Research Program. The program provides exciting opportunities to develop innovative imaging and bioengineering technologies related to both clinical and basic biomedical sciences. It serves as a focal point for the current trans-NIH research initiative, "Imaging from Molecules to Cells," as well as a natural hub for new initiatives involving interdisciplinary research, such as nanotechnology and nanomedicine, and research training.

At the beginning of FY 2008, the Division of Bioengineering and Physical Science (DBEPS) was integrated into the Intramural Research Program as the Laboratory of Bioengineering and Physical Science. The transfer has brought to NIBIB new expertise that spans technologies ranging in scale from near-atomic resolution to intact organisms, and supports the mission to integrate bioengineering with the life and physical sciences.

Budget Policy: The FY 2009 budget estimate for the Intramural Research Program is \$10.9 million, a \$1.4 million increase (+15.3%) over the FY 2008 estimate. This increase includes funding for a new intramural research laboratory aimed at translational radiologic research, and funding to help offset increases for pay costs, centrally furnished services, and supplies and materials.

Research Management and Support: 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. The Institute currently oversees more than 700 research project grants and centers.

Budget Policy: The FY 2009 budget estimate for Research Management and Support is \$16.3 million, a \$0.2 million increase (+1.5%) over the FY 2008 estimate. This increase reflects NIH policy for Research Management and Support in FY 2009 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 2008 Enacted	FY 2009 Estimate	Increase or Decrease
Total compensable workyears:			
Full-time employment	88	88	0
Full-time equivalent of overtime and holiday hours	0	0	0
Average ES salary	\$0	\$0	\$0
Average GM/GS grade	12.4	12.4	0.0
Average GM/GS salary	\$98,491	\$103,022	\$4,531
Average salary, grade established by act of July 1, 1944 (42 U.S.C. 207)	\$0	\$0	\$0
Average salary of ungraded positions	136,725	143,014	6,289
OBJECT CLASSES	FY 2008 Enacted	FY 2009 Estimate	Increase or Decrease
Personnel Compensation:			
11.1 Full-time permanent	\$5,600,000	\$5,855,000	\$255,000
11.3 Other than full-time permanent	1,500,000	1,570,000	70,000
11.5 Other personnel compensation	180,000	187,000	7,000
11.7 Military personnel	0	0	0
11.8 Special personnel services payments	186,000	195,000	9,000
Total, Personnel Compensation	7,466,000	7,807,000	341,000
12.0 Personnel benefits	1,495,000	1,565,000	70,000
12.2 Military personnel benefits	0	0	0
13.0 Benefits for former personnel	0	0	0
Subtotal, Pay Costs	8,961,000	9,372,000	411,000
21.0 Travel and transportation of persons	355,000	365,000	10,000
22.0 Transportation of things	27,000	29,000	2,000
23.1 Rental payments to GSA	22,000	24,000	2,000
23.2 Rental payments to others	0	0	0
23.3 Communications, utilities and miscellaneous charges	153,000	170,000	17,000
24.0 Printing and reproduction	57,000	62,000	5,000
25.1 Consulting services	980,000	1,065,000	85,000
25.2 Other services	1,217,000	1,291,000	74,000
25.3 Purchase of goods and services from government accounts	24,620,000	25,442,000	822,000
25.4 Operation and maintenance of facilities	15,000	17,000	2,000
25.5 Research and development contracts	2,574,000	2,698,000	124,000
25.6 Medical care	0	0	0
25.7 Operation and maintenance of equipment	446,000	496,000	50,000
25.8 Subsistence and support of persons	0	0	0
25.0 Subtotal, Other Contractual Services	29,852,000	31,009,000	1,157,000
26.0 Supplies and materials	710,000	810,000	100,000
31.0 Equipment	868,000	1,171,000	303,000
32.0 Land and structures	0	0	0
33.0 Investments and loans	0	0	0
41.0 Grants, subsidies and contributions	257,640,000	257,242,000	(398,000)
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	289,684,000	290,882,000	1,198,000
Total Budget Authority by Object	298,645,000	300,254,000	1,609,000

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 2008 Enacted	FY 2009 Estimate	Increase or Decrease
Personnel Compensation:			
Full-time permanent (11.1)	\$5,600,000	\$5,855,000	\$255,000
Other than full-time permanent (11.3)	1,500,000	1,570,000	70,000
Other personnel compensation (11.5)	180,000	187,000	7,000
Military personnel (11.7)	0	0	0
Special personnel services payments (11.8)	186,000	195,000	9,000
Total Personnel Compensation (11.9)	7,466,000	7,807,000	341,000
Civilian personnel benefits (12.1)	1,495,000	1,565,000	70,000
Military personnel benefits (12.2)	0	0	0
Benefits to former personnel (13.0)	0	0	0
Subtotal, Pay Costs	8,961,000	9,372,000	411,000
Travel (21.0)	355,000	365,000	10,000
Transportation of things (22.0)	27,000	29,000	2,000
Rental payments to others (23.2)	0	0	0
Communications, utilities and miscellaneous charges (23.3)	153,000	170,000	17,000
Printing and reproduction (24.0)	57,000	62,000	5,000
Other Contractual Services:			
Advisory and assistance services (25.1)	950,000	1,035,000	85,000
Other services (25.2)	1,217,000	1,291,000	74,000
Purchases from government accounts (25.3)	15,733,000	16,461,000	728,000
Operation and maintenance of facilities (25.4)	15,000	17,000	2,000
Operation and maintenance of equipment (25.5)	446,000	496,000	50,000
Subsistence and support of persons (25.8)	0	0	0
Subtotal Other Contractual Services	18,361,000	19,300,000	939,000
Supplies and materials (26.0)	710,000	810,000	100,000
Subtotal, Non-Pay Costs	19,663,000	20,736,000	1,073,000
Total, Administrative Costs	28,624,000	30,108,000	1,484,000

**NATIONAL INSTITUTES OF HEALTH
National Institute of Biomedical Imaging and Bioengineering**

Authorizing Legislation

	PHS Act/ Other Citation	U.S. Code Citation	2007 Amount Authorized	FY 2008 Enacted	2008 Amount Authorized	FY 2009 Budget Estimate
Research and Investigation	Section 301	42§241	Indefinite	\$298,645,000	Indefinite	\$300,254,000
Imaging and Bioengineering	Section 402(a)	42§281	Indefinite		Indefinite	
Total, Budget Authority					298,645,000	300,254,000

NATIONAL INSTITUTES OF HEALTH
National Institute of Biomedical Imaging and Bioengineering

Appropriations History

Fiscal Year	Budget Estimate to Congress	House Allowance	Senate Allowance	Appropriation <u>1/</u>
2002	40,206,000 <u>2/</u>	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
2008	300,463,000	303,318,000	304,319,000	303,955,000
Rescission				(5,310,000)
2009	300,254,000			

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 2007 Actual	FY 2008 Enacted	FY 2009 Estimate
Office of the Director	5	5	5
Extramural Science Program	16	17	17
Office of Research Administration	16	16	16
Office of Administrative Management	17	17	17
Intramural Science Program	31	33	33
Total	85	88	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		
2005	12.8		
2006	12.5		
2007	12.4		
2008	12.4		
2009	12.4		

NATIONAL INSTITUTES OF HEALTH
National Institute of Biomedical Imaging and Bioengineering

Detail of Positions

GRADE	FY 2007 Actual	FY 2008 Enacted	FY 2009 Estimate
Total, ES Positions	0	0	0
Total, ES Salary	0	0	0
GM/GS-15	13	13	13
GM/GS-14	19	20	20
GM/GS-13	16	16	16
GS-12	12	13	13
GS-11	2	2	2
GS-10	1	1	1
GS-9	3	3	3
GS-8	2	2	2
GS-7	2	2	2
GS-6	0	0	0
GS-5	5	5	5
GS-4	2	2	2
GS-3	0	0	0
GS-2	1	1	1
GS-1	0	0	0
Subtotal	78	80	80
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	17	17	17
Total permanent positions	69	88	88
Total positions, end of year	98	105	105
Total full-time equivalent (FTE) employment, end of year	85	88	88
Average ES salary	0	0	0
Average GM/GS grade	12	12	12
Average GM/GS salary	92,916	98,491	103,022

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