

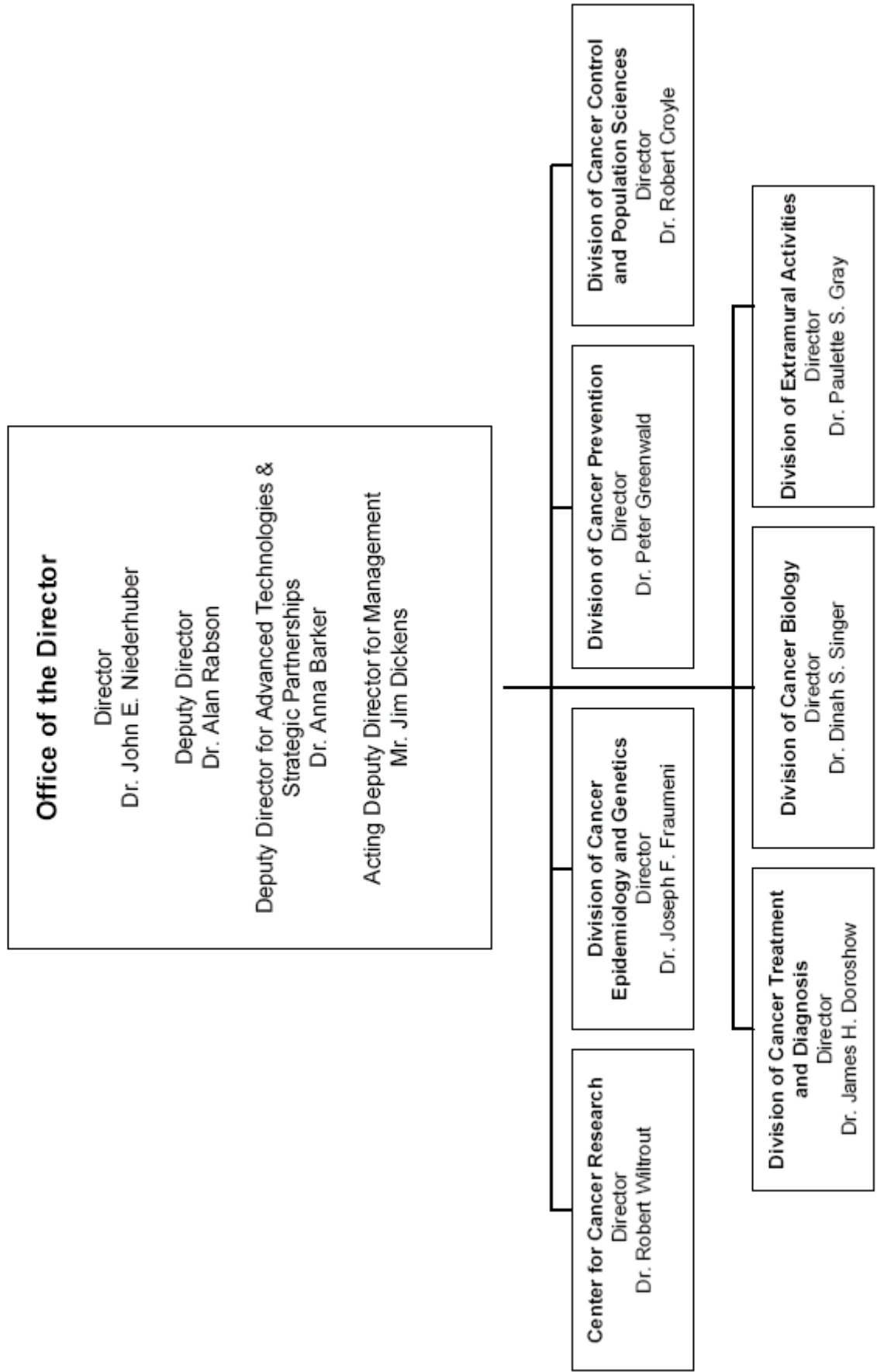
DEPARTMENT OF HEALTH AND HUMAN SERVICES

NATIONAL INSTITUTES OF HEALTH

National Cancer Institute

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NATIONAL INSTITUTES OF HEALTH
National Cancer Institute
Organization Chart



NATIONAL INSTITUTES OF HEALTH

National Cancer Institute

For carrying out Section 301 and title IV of the Public Health Service Act with respect to cancer, [\$5,101,666,000] \$5,264,643,000, of which up to \$8,000,000 may be used for facilities repairs and improvements at the National Cancer Institute-Frederick Federally Funded Research and Development Center in Frederick, Maryland (Public Law 111-117, Consolidated Appropriations Act, 2010).

**National Institutes of Health
National Cancer Institute**

Amounts Available for Obligation 1/

Source of Funding	FY 2009 Actual	FY 2010 Enacted	FY 2011 PB
Appropriation	\$4,968,973,000	\$5,103,388,000	\$5,264,643,000
Type 1 Diabetes	0	0	0
Rescission	0	0	0
Supplemental	0	0	0
Subtotal, adjusted appropriation	4,968,973,000	5,103,388,000	5,264,643,000
Real transfer under Director's one-percent transfer authority (GEI)	-2,042,000	0	0
Real transfer to the Global Fund to fight HIV/AIDS, Malaria and Tuberculosis	0	0	0
Comparative transfer to NLM	-1,259,000	-1,722,000	0
Comparative transfer under Director's one-percent transfer authority (GEI)	2,042,000	0	0
Comparative transfer to the Global Fund to fight HIV/AIDS, Malaria and Tuberculosis	0	0	0
Comparative transfer from DHHS for Autism	0	0	0
Subtotal, adjusted budget authority	4,967,714,000	5,101,666,000	5,264,643,000
Unobligated balance, start of year	0	0	0
Unobligated balance, end of year	0	0	0
Subtotal, adjusted budget authority	4,967,714,000	5,101,666,000	5,264,643,000
Unobligated balance lapsing	-4,000	0	0
Total obligations	4,967,710,000	5,101,666,000	5,264,643,000

1/ Excludes the following amounts for reimbursable activities carried out by this account:
FY 2009 - \$18,739,000 FY 2010 - \$25,000,000 FY 2011 - \$25,000,000
Excludes \$43,133,931 in FY 2009 and \$39,166,968 in FY 2010 for royalties
Excludes \$3,403,204 of revenue collected in FY 2009 from the Breast Cancer Stamp

**NATIONAL INSTITUTES OF HEALTH
National Cancer Institute
(Dollars in Thousands)**

Budget Mechanism - Total

MECHANISM	FY 2009 Actual		FY 2009 Recovery Act Actual		FY 2010 Recovery Act Estimated		FY 2010 Enacted		FY 2011 PB		Change	
	No.	Amount	No.	Amount	No.	Amount	No.	Amount	No.	Amount	No.	Amount
Research Grants:												
Research Projects:												
Noncompeting	3,679	\$1,548,553			477	\$181,567	3,578	\$1,547,481	3,898	\$1,714,979	320	\$167,498
Administrative supplements	(265)	33,130	487	141,375		700	(276)	35,000	(198)	25,000	(78)	(10,000)
Competing:												
Renewal	328	160,182	98	35,476			541	246,487	366	220,492	(175)	-25,995
New	900	295,191	384	151,798			884	292,583	853	249,925	(31)	-42,658
Supplements	1	67	61	43,551			1	67	1	67	0	0
Subtotal, competing	1,229	455,440	543	230,825	0	0	1,426	539,137	1,220	470,484	(206)	(68,653)
Subtotal, RPGs	4,908	2,037,123	543	372,200	477	182,267	5,004	2,121,618	5,118	2,210,463	114	88,845
SBIR/STTR	261	91,954	1	6,906		2,861	297	97,439	297	97,439	0	0
Subtotal, RPGs	5,169	2,129,077	544	379,106	477	185,128	5,301	2,219,057	5,415	2,307,902	114	88,845
Research Centers:												
Specialized/comprehensive	210	560,255	21	97,083	16	33,060	211	568,887	211	574,589	0	5,702
Clinical research	0	0					0	0	0	0	0	0
Biotechnology	0	1,198					0	1,216	0	1,216	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	210	561,453	21	97,083	16	33,060	211	570,103	211	575,805	0	5,702
Other Research:												
Research careers	499	79,120	0	11,360		0	500	80,345	500	81,148	0	803
Cancer education	83	31,945	1	1,292			83	32,438	83	32,762	0	324
Cooperative clinical research	134	234,531		19,821		1,372	134	238,150	134	240,532	0	2,382
Biomedical research support	0	0				0	0	0	0	0	0	0
Minority biomedical research support	1	889				0	1	902	1	929	0	27
Other	146	70,809	1	11,201		0	146	71,893	146	72,612	0	719
Subtotal, Other Research	863	417,294	2	43,674	0	1,372	864	423,728	864	427,983	0	4,255
Total Research Grants	6,242	3,107,824	567	519,863	493	219,560	6,376	3,212,888	6,490	3,311,690	114	98,802
Research Training:												
Individual awards	201	8,654					203	8,776	203	9,303	0	527
Institutional awards	1,291	61,480	10	1,109			1,310	62,438	1,310	66,184	0	3,746
Total, Training	1,492	70,134	10	1,109	0	0	1,513	71,214	1,513	75,487	0	4,273
Research & development contracts (SBIR/STTR)												
	448	617,173		318,458		180,592	454	626,267	454	641,347	0	15,080
	(54)	(16,665)					(42)	(13,251)	(46)	(15,579)	(4)	(2,328)
Intramural research												
Research management and support	1,882	780,554		143		6,000	1,912	792,575	2,001	817,937	89	25,362
Construction	1,074	384,109		6,023		4,769	1,080	390,802	1,126	410,342	46	19,540
Buildings and Facilities		7,920						7,920		7,840		(80)
Total, NCI	2,956	4,967,714		845,596		410,921	2,992	5,101,666	3,127	5,264,643	135	162,977

NATIONAL INSTITUTES OF HEALTH
National Cancer Institute
BA by Program
(Dollars in thousands)

	FY 2007 Actual		FY 2008 Actual		FY 2009 Actual		FY 2009 Comparable		FY 2010 Enacted		FY 2011 PB		Change	
	FTEs	Amount	FTEs	Amount	FTEs	Amount	FTEs	Amount	FTEs	Amount	FTEs	Amount	FTEs	Amount
Extramural Research														
<u>Detail:</u>														
Understand the Mechanisms of Cancer		\$796,449		\$810,147		\$820,468		\$820,468		\$845,207		\$871,973		26,766
Understand the Causes of Cancer		1,094,106		1,082,098		1,117,490		1,118,939		1,147,592		1,173,436		25,844
Improve Early Detection and Diagnosis		410,618		387,125		407,637		407,637		422,864		432,737		9,873
Develop Effective and Efficient Treatments		1,146,272		1,186,919		1,216,395		1,216,268		1,245,107		1,291,490		46,383
Cancer Prevention and Control		333,224		325,222		298,901		298,901		313,828		317,746		3,918
Cancer Centers, Specialized Centers and SPOREs		471,669		477,034		532,273		532,273		544,349		569,682		25,333
Research Workforce Development		179,155		179,518		181,199		181,199		183,997		189,397		5,400
Buildings and Facilities		7,920		7,920		7,920		7,920		7,920		7,840		-80
Subtotal, Extramural*		4,439,413		4,455,983		4,582,283		4,583,605		4,710,864		4,854,301		143,437
Intramural research	1,811	706,179	1,841	724,086	1,882	781,389	1,882	780,554	1,912	792,575	2,001	817,937	89	25,362
Res. management & support	1,017	353,211	1,041	371,573	1,074	384,644	1,074	384,109	1,080	390,802	1,126	410,342	46	19,540
TOTAL	2,828	4,792,624	2,882	4,827,556	2,956	4,966,927	2,956	4,967,714	2,992	5,101,666	3,127	5,264,643	135	188,339

Includes FTEs which are reimbursed from the NIH Roadmap for Medical Research
*The detail programs listed above include both extramural and intramural funding.

Major Changes in the Fiscal Year 2011 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 2011 budget request for NCI, which is \$162.977 million more than the FY 2010 Enacted level, for a total of \$5,264.643 million.

Research Project Grants (RPGs; +\$88.845 million; total \$2,210.463 million): NCI will continue to support competing RPGs—1,220 awards in FY 2011, a decrease of 206 from FY 2010. About 3,898 noncompeting RPGs awards, totaling \$1,714.979 million also will be made in FY 2011.

**NATIONAL INSTITUTES OF HEALTH
National Cancer Institute
Summary of Changes**

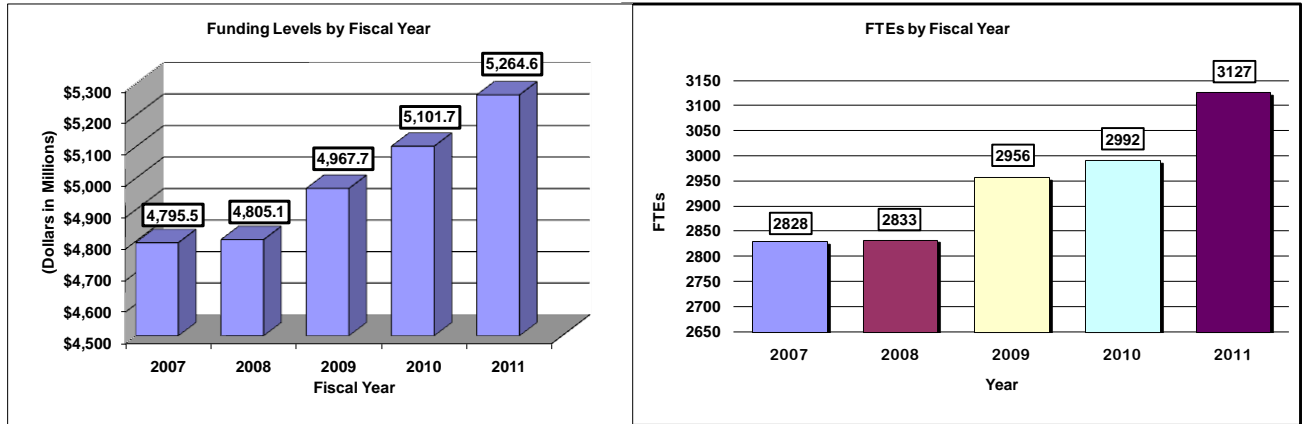
FY 2010 estimate		\$5,101,666,000	
FY 2011 estimated budget authority		5,264,643,000	
Net change		162,977,000	
CHANGES	2010 Current		
	Estimate Base	Change from Base	
	Budget		Budget
	Authority	FTEs	Authority
FTEs			
A. Built-in:			
1. Intramural research:			
a. Annualization of January 2010 pay increase	\$315,259,000		\$1,907,000
b. January FY 2011 pay increase	315,259,000		3,310,000
c. Zero less days of pay (n/a for 2011)	315,259,000		0
d. Payment for centrally furnished services	115,578,000		2,312,000
e. Increased cost of laboratory supplies, materials, and other expenses	361,738,000		5,982,000
Subtotal			13,511,000
2. Research management and support:			
a. Annualization of January 2010 pay increase	\$158,562,000		\$959,000
b. January FY 2011 pay increase	158,562,000		1,665,000
c. Zero less days of pay (n/a for 2011)	158,562,000		0
d. Payment for centrally furnished services	25,282,000		506,000
e. Increased cost of laboratory supplies, materials, and other expenses	206,958,000		3,396,000
Subtotal			6,526,000
Subtotal, Built-in			20,037,000

**NATIONAL INSTITUTES OF HEALTH
National Cancer Institute
Summary of Changes--continued**

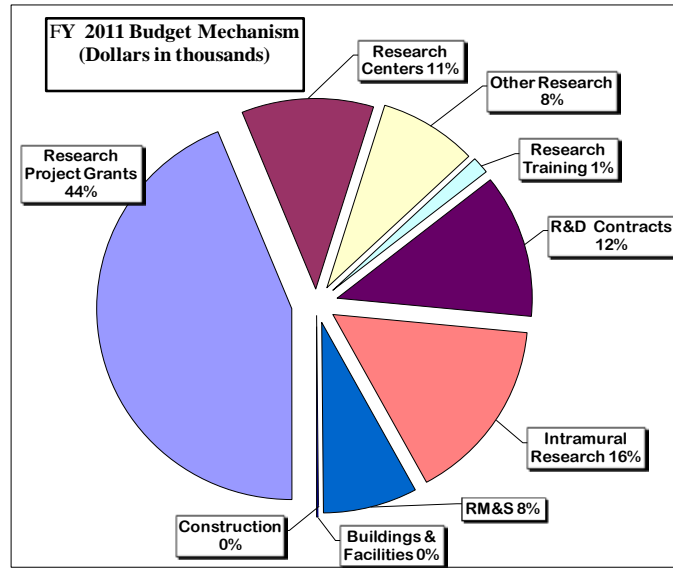
CHANGES	2010 Current Estimate Base		Change from Base	
	No.	Amount	No.	Amount
B. Program:				
1. Research project grants:				
a. Noncompeting	3,578	\$1,582,481,000	320	\$157,498,000
b. Competing	1,426	539,137,000	(206)	(68,653,000)
c. SBIR/STTR	297	97,439,000	0	0
Total	5,301	2,219,057,000	114	88,845,000
2. Research centers	211	570,103,000	0	5,702,000
3. Other research	864	423,728,000	0	4,255,000
4. Research training	1,513	71,214,000	0	4,273,000
5. Research and development contracts	454	626,267,000	0	15,080,000
Subtotal, extramural				118,155,000
	<u>FTEs</u>		<u>FTEs</u>	
6. Intramural research	1,912	792,575,000	89	11,851,000
7. Research management and support	1,080	390,802,000	46	13,014,000
8. Construction		0		0
9. Buildings and Facilities		7,920,000		(80,000)
Subtotal, program		5,101,666,000		142,940,000
Total changes	2,992		135	162,977,000

Fiscal Year 2011 Budget Graphs

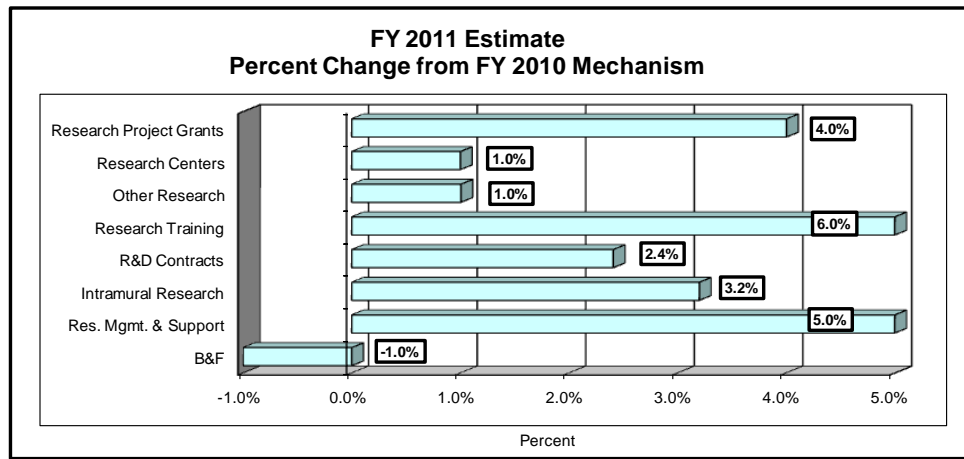
History of Budget Authority and FTEs:



Distribution by Mechanism:



Change by Selected Mechanism:



Justification

National Cancer Institute

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

Budget Authority:

	FY 2009 <u>Omnibus</u>	FY 2010 <u>Appropriation</u>	FY 2011 President's <u>Budget</u>	FY 2011+/- 2010 <u>Appropriation</u>
BA	\$4,967,714,000	\$5,101,666,000	\$5,264,643,000	\$162,977,000
FTE	2,956	2,992	3,127	135

This document provides justification for the Fiscal Year (FY) 2011 activities of the National Cancer Institute (NCI), including HIV/AIDS activities. Details of the FY 2011 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

As we gain a greater understanding of the inherited and acquired genomic changes that underlie the development and metastasis of cancer, we have grown increasingly aware of the immense complexity of cancer and the considerable barriers that must be overcome in order to cure or control its progression. This continuous expansion of knowledge is giving us deeper insight into the relationship of a tumor to its microenvironment (normal tissues supporting tumor growth), the role of cancer stem cells, the intra- and inter-cellular communication pathways, and the mechanisms driving metastasis. This expansion of information is rapidly informing new means by which cancer can be prevented, diagnosed, and treated.

The National Cancer Institute (NCI) is committed to an extensive drug development platform that takes our understanding of the cancer process and moves those discoveries into therapeutic interventions for the cancer patient. Advanced genome sequencing technology will soon make it possible to completely sequence both normal and disease tissue of individual patients. The progress that is being made using this growing knowledge is opening up a vision for a future of personalized cancer medicine; a time when doctors will determine risk for disease, prognosis if disease occurs, and treatment options that are pharmacogenetically based on identified molecular targets unique to each patient.

The Cancer Genome Atlas (TCGA) is cataloguing the array of genomic alterations in specific cancers that allows them to grow without regard for control mechanisms that

exist in normal cells. Using aggregate genomic data, researchers studying the functional biology associated with the genetic changes will be able to identify the pathways or networks of pathways associated with these genomic changes that result in cancer. These cancer-related pathways will be further interrogated using probes and specific assays to find “druggable” targets. High-throughput screening technologies of comprehensive, large chemical and natural product libraries will be used to identify small molecules or biologic agents against those unique targets. Scientists working at the interface of chemistry and biology will optimize the agents to be more effective and less toxic with the goal to move the most promising agents into first-in-man studies.

NCI’s cancer Human Biobank (caHUB) initiative is a vital resource that ensures an adequate and continuous supply of human biospecimens and associated data—acquired within an ethical framework—in order to support important genome sequencing programs such as TCGA. NCI is creating new bioinformatics infrastructures that allow researchers to share data, resources, and tools; to employ advanced technologies, like subcellular imaging to map molecular interactions and pathways associated with disease; and to bring new advances in cancer treatment to the patients in the communities where they live and work.

NCI is facilitating research teams, not just biologists, but also mathematicians and physical scientists to work on innovative and integrated approaches to understand the emergence and behavior of cancer in order to drive the development of the new generation of targeted interventions. NCI is not only a leader, but at times is the unifying force for innovative partnerships and programs, bringing together the public, private and academic sectors, diverse scientific disciplines, and stakeholders, to hasten the pace of our scientific progress and dramatically alter the impact of cancer.

The ability to use genetically profiled tumors to match patients to highly specific targeted therapies will not only improve patient outcomes, it has the potential to reduce healthcare costs through more streamlined patient care and reduced drug development costs because patients will not be receiving expensive therapies that would not be of benefit.

NCI recognizes cancer as not just a U.S. problem but as a worldwide health crisis. NCI is committed to expanding its international research program, particularly in developing nations where the majority of new cancer cases are occurring.

Overall Budget Policy: NCI’s highest priorities for FY 2011 are to operationalize an extensive strategic program based upon patient characterization and a drug development platform that takes our rapidly expanding knowledge of the genomic changes that underlie the development and metastasis of cancer and moves those discoveries into preventive, diagnostic and therapeutic interventions for the cancer patient. The progress that is being made is opening up a vision and creating an opportunity for personalized cancer medicine; a time when doctors will determine risk for disease, prognosis if disease occurs, and treatment options that are pharmacogenetically based on the understanding of each individual patient’s unique

genetic makeup and the genetic aberrations that have led to his or her cancer. At the same time, NCI will continue to support a critical need for our country--the training and mentoring of new investigators, who will invigorate our country's scientific capacity for years to come. In FY 2011, NCI plans to support new investigators on R01 equivalent awards at success rates equivalent to those of established investigators submitting new R01 equivalent applications.

The major portion of NCI's budget is allocated to support scientists within the nation's research community at universities, teaching hospitals, and cancer centers dispersed throughout the country. These extramural investigators submit proposals that contain their best scientific thinking that address all aspects of the cancer research continuum. The NCI Intramural Research Program also encompasses laboratory investigation, epidemiologic and genetics studies, translational research, and clinical research. The excellence of NCI scientists and the intramural infrastructure enable the Institute to conduct high-risk and distinctive research, broadly distribute advanced technologies, and forge partnerships with public, private and academic institutions. Cancer patients benefit from access to clinical research protocols and treatments conducted at the Sen. Mark Hatfield NIH Clinical Research Center.

NCI will continue to support new investigators and to maintain an adequate number of competing RPGs. NCI is providing a 2 percent inflationary increase for non-competing and competing grants. Intramural Research and Research Management and Support receive an increase to help cover the cost of pay and other increases.

Funds are included in R&D contracts 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, as well as increased support for other HHS agencies through the program evaluation set-aside.

Scientific Opportunities

Supported by funds from FY2011, dramatic advances in genomic technology will make it possible to produce a detailed catalogue of all the reasons why normal cells become malignant for twenty of the most common cancers including prostate, breast, and pancreatic. Expansion of The Cancer Genome Atlas will enable precise diagnosis of cancer subtypes with different prognoses, as well as identification of at least ten new drug targets based on the detailed understanding of what pathways within the cell have gone awry. To shorten the timeline for development of new cancer drugs and get promising new treatments into human clinical trials as quickly as possible, 30 new clinical studies in FY2011 to rapidly test the effectiveness of molecularly-targeted cancer therapies will be initiated and build upon the ACTNOW program begun with ARRA funds.

Furthermore, in major efforts to improve cancer prevention, NCI will conduct critical research in FY2011 to improve the effectiveness of smoking cessation interventions and

reduce the use of smokeless tobacco. New programs will aim to improve cessation approaches for low-income adults and hospitalized patients and to help state and community tobacco control programs better target their efforts.

FY2011 dollars will also create the first nationwide-collection of data on diagnosis, treatment, and outcomes from millions of cancer patients over time, and make those data available for research. This will enable treating physicians to use treatment outcomes in order to customize interventions and enable researchers to access data from across the nation to accelerate new discoveries to advance personalized medicine.

The combination of powerful new DNA sequencing technologies together with new computational tools and electronic medical records will provide an unprecedented opportunity in FY2011 to make real strides to reduce cancer and the toll it takes on individuals, families, and communities.

Additional longer-term scientific opportunities in cancer:

- Trials will be near completion that show that combining individualized prediction of risk for breast, prostate, or colon cancer, based on family history and specific DNA testing, will add greatly to the value of mammograms, PSA testing, and colonoscopy – allowing these screening procedures to be optimized in timing and frequency based on the individual’s likelihood of developing cancer.
- New technologies to assess environmental risk factors for cancer will add to the number of proven carcinogens.
- Cost of determining the complete genome sequence of a cancer will fall to less than \$1000 (currently ~\$20,000).
- Additional high throughput technologies will enable assessment of gene expression and epigenomic regulatory alterations of gene transcription and translation within a given cancer.
- Cancer diagnostics will evolve into a new paradigm, where classification is based upon what molecular pathways are abnormal in the tumor, not solely what organ it arose in or what the cells look like under the microscope. That classification will improve the ability to predict prognosis and potential response to therapy.
- Identification of pathways that could be therapeutically important in the cancer cell will be explored by a systematic “synthetic lethal” knockdown approach (utilizing a powerful new strategy involving siRNA) on a large panel of cancer cell lines and fresh tumor cell suspensions.
- There will be a substantial increase in new cancer drug targets.
- New promising compounds, based upon these new targets, will be under development in both the public and private sectors (and often as partnerships between the two).
- The majority of NCI-sponsored clinical trials will include complete genomic analysis of every tumor, in order to match genomic findings with the appropriate drug combination.

- This kind of personalized or prescriptive approach to the design of next generation therapy trials will make it possible to run smaller and less expensive drug clinical trials driving down the cost as well as the time for approval of new anti-cancer drugs. NCI will achieve its goal of cutting in half the cost and time of clinical trials.
- There will be a significant increase in the number of novel compounds in Phase 1 – 3 clinical trials for cancer.
- Trials of the nicotine vaccine will have shown substantial benefit in preventing relapse of former smokers.
- Large numbers of Americans will have their complete genome sequence determined and placed in their medical record, allowing reliable prediction of future risks of cancer.
- That information will allow individualized programs of prevention, focusing dietary recommendations, avoidance of environmental triggers, and screening programs on those who need them most.
- Complete genomic characterization of every cancer will be part of routine medical care.
- The inventory of FDA-approved targeted cancer therapeutics, aimed at specific molecular pathways that are known to be abnormal in certain cancer cells will be expanded.
- Cancer treatment will involve a careful and rational matching of the molecular characteristics of each patient's tumor with the available drugs.
- Pharmacogenomic information will then allow the right dose of the drug to be chosen for that particular person.

Understand the Mechanisms of Cancer

Expanding our knowledge of the genomic changes that underlie the development and metastasis of cancer is a keystone of NCI's research mission. Emerging technologies that enable comprehensive molecular analysis of tumors and the tumor environment will help researchers understand the processes involved in the initiation and progression of specific types of cancer. For example, NCI is expanding both the Cancer Genome Atlas (TCGA) in adult cancers and Therapeutically Applicable Research to Generate Effective Treatments (TARGET) in pediatric cancers. Both projects are comprehensively characterizing the genomic alterations and molecular pathways involved in the development of cancer.

Budget Policy: The FY 2011 budget request for the Understanding the Mechanisms of Cancer program is \$871.973 million, an increase of \$26.766 million, or 3.2 percent over the FY 2010 Enacted level. The highest priority will be to scale up The Cancer Genome Atlas (TCGA) from its pilot phase of three tumor types with an aggressive goal of comprehensively characterizing 20 tumor types. NCI will also extend its program in pediatric cancer genomics, Therapeutically Applicable Research to Generate Effective

Treatments (TARGET) which utilizes the TCGA approach to identify valid therapeutic targets in childhood cancers. The genomic analysis of all major tumors will be a key driver of future research as scientists develop this new knowledge into targeted therapies. A growing body of evidence suggests that some tumors are driven by a small number of cells that have properties similar to embryonic stem cells called “cancer stem cells” or “tumor-initiating cells.” NCI will support a new initiative to develop methods for isolating, culturing and characterizing these rare cells and their role in tumor initiation, metastasis and dormancy. The Tumor Microenvironment Network (TMEN) will focus on understanding the tumor microenvironment’s role in tumorigenesis while the Integrative Cancer Biology Program (ICBP) will employ a systems approach using computational models of processes to analyze cancer as a complex biological system. Finally, NCI recently launched a Physical Sciences-Oncology Centers (PS-OC) program composed of new teams and a field of study in which physical scientists working closely with basic and clinical cancer researchers will characterize the physical and chemical forces that govern the behavior of cancer at all levels.

Portrait of a Program: Physical Sciences-Oncology Centers

FY 2010 Level: \$ 22.7 million

FY 2011 Level: \$ 32.0 million

Change: \$ 9.3 million

The National Cancer Institute (NCI) is using an innovative approach to better understand cancer that brings the power of physics, mathematics and engineering together with cancer biologists and oncologists to better understand the emergence and behavior of cancer using non-traditional approaches and important concepts derived from the physical sciences. Physical Science-Oncology Centers will be integrated with NCI’s very successful centers in nanobiology, systems biology and proteomics to generate new prospective strategies for cancer treatment, diagnosis, and prevention.

Some of the areas that this new generation of transdisciplinary teams will focus on include:

(1) Understanding the physics of cancer by expanding our knowledge of how physical laws governing forces, energy flows, gradients, mechanics, and thermodynamics affect cancer cells versus normal cells, (2) Understanding evolutionary processes of cancer from a physics perspective and somatic evolution, (3) Understanding the coding, decoding and information transfer in cancer at the molecular and submolecular levels, particularly in the microenvironment, as well as determining the impact of information flows along multiple length- and time-scales in order to gain an understanding of how it differs from what occurs in normal cells and tissues, (4) De-convoluting the complexity of cancer through the development of dynamic physics-based theoretical models of cancer.

Understand the Causes of Cancer

NCI’s etiology research focuses on genetic, environmental, and lifestyle factors which contribute to cancer development. An important opportunity has been created through NCI’s investment in collaborative cohort population studies that help researchers exploit the potential of genetics and identify gene variants that affect cancer risk, diagnosis, and prognosis. It is now possible to interrogate the entire human genome and its 25,000 genes in persons with and without cancer to allow the genome itself to tell us which genes are important to susceptibility. This technology is discovering new susceptibility genes for cancer and other diseases at a remarkable rate. For example, 3 years ago no susceptibility genes for prostate

cancer were known, while today 18 such genes have been identified with more likely to be identified in the coming months.

Budget Policy: The FY 2011 budget request for the Understanding the Causes of Cancer program is \$1.173 billion, an increase of \$25.844 million, or 2.3 percent over the FY 2010 Enacted level. To support the program goals, high priority will be given to expanding programs to identify the genetic changes associated with cancer susceptibility. Under the auspices of the NIH Genes, Environment and Health Initiative (GEI), genome wide association studies will investigate the determinants of lung cancer risk and identify genes that contribute to smoking persistence and different lung cancer outcomes. NCI will further expand studies to evaluate the role of genetic susceptibility, environmental exposures and gene-environment interactions in other cancer types using an international consortium involving 37 cohorts and 4 million people. Current evidence indicates that as many as one in five cancers may have an infectious cause. NCI will study how viruses or bacteria can impact cancer causation to gain a better understanding of the relationships between infection, immunity and genetics. In addition, NCI will support studies into the role of chronic inflammation in cancer development and explore the increased incidence of cancer in the setting of host immunodeficiency, for example in patients infected with HIV. NCI will also conduct innovative research in genetics, imaging and cancer molecular signatures to better understand the relationships between aging and the development and progression of cancer. Finally, NCI will evaluate the role of diet, obesity and cancer emphasizing nutrient status as a modifiable risk factor as well as studying individual response to bioactive food components.

Improve Early Detection and Diagnosis

Accurate tools for detecting and diagnosing tumors can markedly improve the likelihood of a cancer patient's successful treatment and survival. These tools are of greatest benefit early in the disease process, before the tumor becomes invasive. Validated biomarkers are needed for cancer detection and diagnosis, prognosis, and treatment monitoring. New chip technologies and nanotechnology are being used to as platforms to predict risk and as diagnostic tools. For example, NCI is using a microfluidic chip cell-sorting technology that allows scientists to capture only tumor cells. Technology is also being developed to grow these isolated cancer cells revealing new insights into cellular biology. NCI plans to expand programs in single-cell detection technologies.

Budget Policy: The FY 2011 budget request for the Improving Early Detection and Diagnosis program is \$432.737 million, an increase of \$9.873 million, or 2.3 percent over the FY 2010 Enacted level. Patients from the NIH Clinical Center, NCI's SPORE Program, the NCI Community Cancer Centers Program, the Community Clinical Oncology Program, the Clinical Cooperative Groups, and the NCI-designated Cancer Centers network will be key components in the development of a highly characterized national cohort of patients. Each patient will have his/her total genomic sequence catalogued along with their complete electronic health record. This data will be stored—with patient privacy protected—in a central repository for studies in early cancer

detection, diagnosis, and to help define tumor subtypes. NCI will further expand profiling of this national patient cohort to include proteomic and metabolomic data relevant to each patient's tumor. NCI also will develop a model for a Patient Characterization Center that will support innovative technology development and proof of principle standards for use in the molecular characterization of those collected tumors described above. To support this Center, as well as to provide a continuous supply of high quality biospecimens for the expanding genomic studies under TCGA and TARGET, NCI will establish, ahead of its original timetable, the cancer Human Biobank (caHUB)—an initiative to obtain the highest quality tissue, blood and tumor samples, rigorously and ethically collected, properly stored and extensively annotated. Several cancer-specific projects such as the Trans-NCI Breast Pre-malignancy Program, the Repository for Molecular Brain Neoplasia Data (REMBRANDT), and the Prostate, Lung, Colorectal, Ovarian Screening Study (PLCO) are studying the biological events leading to cancer and identifying and validating candidate biomarkers of early disease with the potential of developing cancer diagnostic tests within the next few years.

Develop Effective and Efficient Treatments

Developing more efficient and effective cancer treatments that leave healthy tissues unharmed is a primary mission of NCI's research agenda. The opportunities afforded for cancer drug discovery and development by an unprecedented range of large-scale genomic studies and other efforts to define cancer genomes, proteomes and epigenomes portend a future of targeted therapies and highly individualized cancer therapies.

Budget Policy: The FY 2011 budget request for the Developing Effective and Efficient Treatments program is \$1.291 billion, an increase of \$46.383 million, or 3.7 percent over the FY 2010 Enacted level. A high priority for the NCI is an integrated drug development platform that turns information about genomic and genetic aberrations into knowledge of biologic function—about proteins and pathways that facilitate cancer development and growth—to identify specific targets for new therapies. With the expansion of TCGA, TARGET and other genomic association studies, identification of these potential targets will be accelerated. NCI's functional biology efforts and its Chemical Biology Consortium (a network of institutes that have formal agreements with expert biologists and chemists to optimize compounds and increase the flow of early-stage drug candidates) are key components of the NCI Experimental Therapeutics Program (NExT). NExT is a wide ranging initiative that unifies cancer drug development under a single umbrella and places NCI in a unique position to enable a new drug development paradigm; facilitating the many back and forth handoffs that must occur between academic research laboratories, the NExT platform, and the private sector in order to achieve the ultimate goal of translation to patients. The goal of NExT is to shorten the typical 10-12 year drug development timeline by up to six years, getting promising drugs into human trials more quickly and more rapidly eliminating drugs unlikely to be effective. NExT also includes toxicology testing, GMP manufacturing capability, and early phase clinical trials, including Phase 0 trials, in which non-toxic doses of an agent are tested in a small number of patients using advanced assays and

imaging to determine in weeks, not years, whether a drug is reaching its intended target and having its intended biologic effects.

Portrait of a Program: Developmental Therapeutics Platform

FY 2010 Level: \$ 100.0 million

FY 2011 Level: \$ 200.0 million

Change: \$ 100.0 million

NCI has developed a comprehensive approach to translate raw genetic information into an intimate understanding of the function of the genetic pathways which can be used to define targets for manipulating those pathways—moving from data, to function, to target, to therapy.

The Cancer Genome Atlas (TCGA) is actively sequencing patient tumors and finding new gene alterations associated with a specific cancer's development. The program is expanding from the pilot phase of characterizing three tumors (brain, ovarian, lung) with a goal of mapping 20 tumor types over the next two years. Its sister program TARGET (Therapeutically Applicable Research to Generate Effective Treatments) is sequencing pediatric cancers.

A high-volume genome characterization and sequencing program depends heavily on other interconnected programs such as ones that support the availability of high-quality, well-annotated tissue—the NCI cancer Human Biobank (caHUB) initiative. caHUB is a public resource that ensures the continuous supply of human biospecimens and associated data acquired within an ethical framework. Supporting this continuum from patient samples to data generation is a state-of-the-art, interoperable information technology platform that connects all members of the cancer community and permits access to the cancer Biomedical Informatics Grid (caBIG).

Overall, the drug development program will utilize advances in high throughput screening, functional biology, and chemical biology for early identification of lead compounds. The most promising agents will undergo enhanced formulation, pre-clinical testing, toxicology studies and finally production of small quantities of clinical grade drug. The program's aim is to get targeted therapeutic agents into phase 0 human trials involving small numbers of highly characterized patients and to rapidly move the most promising drugs into larger phase I clinical trials.

By creating early drug development programs such as chemical genomics centers, a Functional Biology Consortium (FBC), and a Chemical Biology Consortium (CBC- a network of institutions at the interface of functional/chemical biology and molecular oncology, NCI will move basic scientific findings into the drug development pipeline. Together, extramural and intramural teams are using the NCI Experimental Therapeutics Program (NExT) to increase the targeted drug development pipeline. Finally, as part of this drug development continuum, the NCI is reengineering the cancer clinical trials enterprise to accelerate protocol activation, determine therapeutic regimens based upon highly specific tumor profiling and test treatment solutions or combination therapies in selected patient populations.

Cancer Prevention and Control

Prevention is our first line of defense against cancer. Cancer is defined by stages of initiation and pre-malignant change, pre-invasion, invasion, local progression, and metastasis. This evolutionary process is initiated by alterations in the genome through the effects of driver mutations, translocations and complex changes in gene expression. Preventing cancer also focuses on understanding and modifying behaviors that increase risk; mitigating the influence of genetic and environmental risk factors; and interrupting cancer development through early intervention. NCI supports and conducts cancer control research to better understand factors that influence lifestyle choices, cancer outcomes, improve the quality of care, improve the

quality of life for cancer survivors and their families, and overcome cancer health disparities. As the molecular taxonomy of every type and subtype of cancer is developed, cancer prevention will become more specific, moving toward personalized evidence-based interventions.

Budget Policy: The FY 2011 budget request for Cancer Prevention and Control program is \$317.746 million, an increase of \$3.918 million, or 1.2 percent over the FY 2010 Enacted level. Cancer develops through stages involving initiation and pre-malignant change, pre-invasion, invasion, local progression and metastasis. The fact that these stages occur over time offers opportunities to intervene to halt or reverse the process. Such interventions are increasingly possible through identification of high-risk populations, lifestyle modifications, and early detection and screening strategies, and in some instances, specific drugs. Genome wide association studies represent the first major large-scale effort to catalogue genomic determinants of cancer risk in individuals and populations and will move cancer prevention to personalized evidence-based interventions based upon an individual's tumor signature. It will become increasingly important to have robust surveillance systems to monitor the effects of targeted prevention interventions over time and enable the development of cost-effective models for screening and risk assessment to inform health care reform. NCI's Surveillance, Epidemiology and End Results (SEER) program regularly samples approximately 26 percent of the U.S. population with information on 5.7 million cancer cases—380,000 cases added each year. In addition to SEER, NCI's BIG Health™ will become the information backbone of genomic characterization studies and the implementation tool for electronic health records. The Health Maintenance Organization (HMO) Cancer Research Network (CRN) conducts cancer prevention, early detection, treatment, long-term care, and surveillance using data systems of 14 HMOs nationwide. Supporting research in lifestyle change for cancer prevention, NCI continues to study Energy Balance (integrated effects of diet, physical activity, and genetics on growth and body weight) as a way to control cancer incidence. NCI's Centers for Transdisciplinary Research on Energetics and Cancer (TREC) foster collaboration among scientific teams to accelerate progress toward reducing cancer incidence, morbidity and mortality associated with obesity, low levels of physical activity, and poor diet. Recently, DHHS identified overweight and obesity as a public health priority. NCI plans a coordinated a research effort to inform regulation of tobacco products in response to legislation that provides the FDA the authority to regulate tobacco.

Cancer Centers, Specialized Centers and Specialized Programs of Research Excellence (SPORE) Programs

New research paradigms hinge on interdisciplinary science, strategic partnerships, rapid application of new technologies, optimal information sharing, and close links to health care delivery systems. NCI cancer centers, specialized centers, and SPOREs comprise a model framework that supports team science. The NCI Community Cancer Centers Program is being expanded from the original 16 pilot sites to a total of 30 sites in anticipation of reaching more than 50,000 new cancer cases per year. Through these connections, NCI is extending the reach of its research programs into rural, inner-city, and underserved communities and

identifying cost-effective prevention and personalized medicine for delivering quality, affordable cancer care.

Budget Policy: The FY 2011 budget request for the Cancer Centers, Specialized Centers and Specialized Programs of Research Excellence (SPORE) program is \$569.682 million, an increase of \$25.333 million, or 4.7 percent over the FY 2010 Enacted level. The NCI-designated Cancer Centers represent the best of basic, translational, and population research to improve cancer prevention, diagnosis, and treatment, while also stimulating innovative pilot projects in new investigational areas. Today, these Centers number 65 and are located principally at the country's major academic health institutions. Additionally, there is a strong list of contenders that have been actively planning to apply for Cancer Center designation. NCI plans to expand the number of Cancer Centers to further community outreach. The Minority Institution-Cancer Center Program is designed to build independent competitive cancer research capacity at minority-serving institutions and create stable, long-term collaborative relationships between the Minority Serving Institution (MSI) and the Cancer Center in all areas of cancer research, training, education and outreach. This partnership also seeks to improve the effectiveness of the NCI-designated Cancer Center activities to address cancer disparities in underserved populations and improve minority accrual to cancer clinical trials. Specialized Programs of Research Excellence (SPOREs) comprise a model framework that supports team science. Specialized centers, such as the Physical Science-Oncology Centers, the Integrative Cancer Biology Program Centers, and Nanotechnology Centers focus on key research areas to reduce cancer morbidity and mortality, whereas SPOREs focus on discovery-to-delivery research dedicated to specific cancers.

Portrait of a Program: Community-Based Research

FY 2010 Level: \$ 0.8 million

FY 2011 Level: \$ 41.0 million

Change: \$ 40.2 million

The main objective of the NCCCP is to research ways to provide state-of-the-art cancer care in local communities, with an emphasis on reaching underserved patients. The major goals are to study how to reduce cancer health care disparities; draw more patients into clinical trials; standardize the collection of voluntarily donated tissue and other medical specimens for research purposes; improve information technology capabilities, including electronic health records; improve quality of care; and enhance survivorship and palliative care.

For many cancer patients, the best cancer care and access to clinical trials is simply out of reach because it requires too much travel and too much time away from family and jobs. Patients at NCCCP hospitals have more opportunities to participate in clinical trials, and access to enhanced screening, palliative care and other services. At the same time, cancer researchers need to evaluate interventions in community settings and to involve a greater number and diversity of patients in cancer research to speed up the development of new treatments and improve the quality of care. The program is a major component of NCI's emerging personalized cancer care platform, where approaches to personalized medicine can be developed and tested.

Studies suggest that equal access to quality care could dramatically reduce cancer deaths in the United States. Since a major focus of the NCCCP is to improve access to care among underserved populations with unusually high cancer rates, an expanded program will bring more Americans into a system of high quality cancer care. Access to science and technology will become the most important determinant of successful therapeutic outcome and will be a major driver in decreasing the cost of cancer healthcare.

Research Workforce Development

Developments in molecular biology and translational medicine have broadened the scope of cancer research and presented new challenges for training future cancer researchers. Training in emerging disciplines such as genomics, computational biology, nanotechnology, and bioinformatics will be critical to both build and translate the knowledge for personalized molecularly-based medicine. Of equal or greater importance is a critical need to train the workforce that will be called on to deliver 21st century care to patients with cancer. NCI career development opportunities prepare the next generation of cancer researchers to meet the challenges of multidisciplinary research. NCI provides cancer research training and career entree to high school, undergraduate and graduate students, postdoctoral fellows, and physicians across the United States.

Budget Policy: The FY 2011 budget request for the Research Workforce Development program is \$189.397 million, an increase of \$5.400 million, or 2.9 percent over the FY 2010 Enacted level. To support program goals, high priority will be given to continue the Interagency Oncology Taskforce (IOTF), a partnership with the FDA. This program provides training for a cadre of researchers to bridge the varied research and regulatory processes that range from scientific discovery through clinical development and regulatory review of new oncology products. Fellows also learn how to bring state-of-

the art knowledge and technology to bear on the design, conduct, and review of clinical trials. Training opportunities have arisen from this relationship, including the Fellowship Program in Research and Regulatory Review. In addition, the Principal Investigator 101 training for the Rapid Access to Intervention Development program is organized through the IOTF. Through the Integrative Cancer Biology Program (ICBP) and the Tumor Microenvironment Network (TMEN) Centers, the inter-center training program provides opportunities to gain a broader understanding of the novel approaches to the multi and diverse disciplines which comprise the fields of systems biology or are pertinent to tumor microenvironment. NCI also supports training and mentoring physician scientists to expand their expertise in laboratory or clinical translational research through the Physician Scientist Training Program; paying special attention to funding training and fellowship awards to young investigators to ensure that the future of biomedical research maintains its high level during future decades. NCI has also developed a training program to support research teams working on NCI-funded nanotechnology projects. The goal of this fellowship program is to provide research scientists an opportunity to train outside their current fields of expertise and develop multidisciplinary skill sets that can be applied in the development and testing of nanomaterials and nanodevices in cancer-related applications of diagnosis and treatment. Finally, NCI and the National Science Foundation (NSF) collaborated to establish training programs for U.S. science and engineering doctoral students through the Integrative Graduate Education and Research Traineeship Program (IGERT). This collaboratively supported program represents another approach to training the next generation of biomedical scientists.

Buildings and Facilities

The renovation and improvement funds for the facilities at the NCI-Frederick campus, located in Frederick, Maryland, were budgeted as facilities funds beginning in FY 2005. The funds are necessary to maintain the operation of these facilities for the scientific missions of NCI, NIH, other government agencies, and the extramural community.

Budget Policy: The FY 2011 budget request for the Building and Facilities program is \$7.840 million, a decrease of \$80 thousand, or 1.0 percent below the FY 2010 Enacted level.

Research Management and Support (RMS)

NCI RMS activities provide support for the review, award, and monitoring of technical and administrative services. These services include central administration, overall program direction, grant and contract administration, human resources, program coordination, and financial management. NCI regularly engages in business planning activities to streamline administrative functions.

Budget Policy: The FY 2011 budget request for RMS is \$410.342 million, an increase of \$19.540 million, or 5.0 percent over the FY 2010 Enacted level.

Recovery Act Implementation

Recovery Act Funding: \$1,256.517 million

In FY 2009, NCI received \$1,256.5 million under the Recovery Act. Of this amount, \$845.6 million was obligated in FY 2009 and \$410.9 million will be obligated in FY 2010. Recovery Act funding is being used to support more new grants as well as a number of specific initiatives in several broad areas that will have both immediate economic impacts and longer-term impacts on scientific understanding and treatment.

Drug Development and Personalized Medicine

- The Accelerating Clinical Trials of Novel Oncologic PathWays (ACTNOW) initiative is funding 37 early-stage clinical trials of promising molecularly-targeted therapies.
- The Cancer Genome Atlas (TCGA) is collecting more than 20,000 tissue samples from more than 20 adult tumor types to develop a comprehensive catalog of genomic changes in these cancers.
- The Therapeutically Applicable Research to Generate Effective Treatments (TARGET) initiative is mapping the genetic changes associated with childhood cancers.
- NCI's Experimental Therapeutics (NEXt) program is a wide-ranging initiative that brings together highly specialized drug development programs to move new potential anti-cancer agents through pre-clinical studies, evaluating outcomes, and quickly assessing whether experimental agents are reaching their target to produce the desired effects in humans before committing to large-scale development. The goal of NEXt is to shorten the typical 10-12 year drug development timeline by up to 6 years.

Cancer Centers

- 62 NCI-designated Cancer Centers will receive supplemental funding to hire and retain faculty and staff, purchase equipment for new and existing labs, and increase their investment in information technology, among other things.
- The NCI Community Cancer Centers Program (NCCCP)—a pilot network of 16 community cancer centers that is bringing more Americans, including those from rural and inner-city areas, into a system of high-quality cancer care—is being expanded to 30 sites. Recovery Act funding is also being used to hire additional research nurses, medical technicians, outreach staff and patient navigators, who help patients through the confusing, often overwhelming next steps following a cancer diagnosis.

Infrastructure Development

- The Cancer Biomedical Informatics Grid (caBIG) network is building the bioinformatics infrastructure that will facilitate sharing and integration of data from large-scale research projects, clinical trials, and clinical observations.
- The Cancer Human Biobank (caHUB) Initiative is developing a national, standardized human biospecimen resource to address a key challenge of genomic research—the availability of high-quality specimens. CaHUB and other biobanking programs will also preserve and create jobs to handle increased volume at collection sites nationwide.

Training and Career Development

- NCI is increasing the number of grants to support the training of graduate students and postdoctoral fellows and is providing additional funding for new investigators in establishing their careers.
- The Community Networks Program of the Center to Reduce Cancer Health Disparities supports community-based participatory education, training, and research among racial/ethnic minorities. For example, the WINCART program is enabling young leaders in Pacific Islander communities in Southern California to become the next generation of health researchers. ARRA funding allowed WINCART to expand its 2009 summer internship program from 5 volunteers to 10 paid students.

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Budget Authority by Object

	FY 2010 Enacted	FY 2011 PB	Increase or Decrease	Percent Change
Total compensable workyears:				
Full-time employment	2,992	3,127	135	4.5
Full-time equivalent of overtime and holiday hours	5	5	0	0.0
Average ES salary	\$164,604	\$166,909	\$2,305	1.4
Average GM/GS grade	12.0	12.0	0.0	0.0
Average GM/GS salary	\$95,780	\$97,121	\$1,341	1.4
Average salary, grade established by act of July 1, 1944 (42 U.S.C. 207)	\$80,804	\$81,935	\$1,131	1.4
Average salary of ungraded positions	132,834	134,694	1,860	1.4
OBJECT CLASSES	FY 2010 Estimate	FY 2011 Estimate	Increase or Decrease	Percent Change
Personnel Compensation:				
11.1 Full-time permanent	\$195,057,000	\$197,787,000	\$2,730,000	1.4
11.3 Other than full-time permanent	112,525,000	114,100,000	1,575,000	1.4
11.5 Other personnel compensation	11,507,000	11,668,000	161,000	1.4
11.7 Military personnel	6,161,000	6,247,000	86,000	1.4
11.8 Special personnel services payments	56,906,000	58,557,000	1,651,000	2.9
Total, Personnel Compensation	382,156,000	388,359,000	6,203,000	1.6
12.0 Personnel benefits	87,821,000	89,050,000	1,229,000	1.4
12.2 Military personnel benefits	3,844,000	3,890,000	46,000	1.2
13.0 Benefits for former personnel	0	0	0	0.0
Subtotal, Pay Costs	473,821,000	481,299,000	7,478,000	1.6
21.0 Travel and transportation of persons	15,692,000	16,289,000	597,000	3.8
22.0 Transportation of things	1,438,000	1,491,000	53,000	3.7
23.1 Rental payments to GSA	1,000	1,000	0	0.0
23.2 Rental payments to others	549,000	570,000	21,000	3.8
23.3 Communications, utilities and miscellaneous charges	9,552,000	10,003,000	451,000	4.7
24.0 Printing and reproduction	2,519,000	2,639,000	120,000	4.8
25.1 Consulting services	16,377,000	17,001,000	624,000	3.8
25.2 Other services	241,380,000	258,438,000	17,058,000	7.1
25.3 Purchase of goods and services from government accounts	545,622,000	574,772,000	29,150,000	5.3
25.4 Operation and maintenance of facilities	126,917,000	130,935,000	4,018,000	3.2
25.5 Research and development contracts	362,733,000	360,013,000	(2,720,000)	-0.7
25.6 Medical care	4,184,000	4,213,000	29,000	0.7
25.7 Operation and maintenance of equipment	15,985,000	17,189,000	1,204,000	7.5
25.8 Subsistence and support of persons	0	0	0	0.0
25.0 Subtotal, Other Contractual Services	1,313,198,000	1,362,561,000	49,363,000	3.8
26.0 Supplies and materials	48,470,000	49,922,000	1,452,000	3.0
31.0 Equipment	23,222,000	23,589,000	367,000	1.6
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	3,213,190,000	3,316,265,000	103,075,000	3.2
42.0 Insurance claims and indemnities	2,000	2,000	0	0.0
43.0 Interest and dividends	12,000	12,000	0	0.0
44.0 Refunds	0	0	0	0.0
Subtotal, Non-Pay Costs	4,627,845,000	4,783,344,000	155,499,000	3.4
Total Budget Authority by Object	5,101,666,000	5,264,643,000	162,977,000	3.2

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

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Salaries and Expenses

OBJECT CLASSES	FY 2010 Enacted	FY 2011 PB	Increase or Decrease	Percent Change
Personnel Compensation:				
Full-time permanent (11.1)	\$195,057,000	\$197,787,000	\$2,730,000	1.4
Other than full-time permanent (11.3)	112,525,000	114,100,000	1,575,000	1.4
Other personnel compensation (11.5)	11,507,000	11,668,000	161,000	1.4
Military personnel (11.7)	6,161,000	6,247,000	86,000	1.4
Special personnel services payments (11.8)	56,906,000	58,557,000	1,651,000	2.9
Total Personnel Compensation (11.9)	382,156,000	388,359,000	6,203,000	1.6
Civilian personnel benefits (12.1)	87,821,000	89,050,000	1,229,000	1.4
Military personnel benefits (12.2)	3,844,000	3,890,000	46,000	1.2
Benefits to former personnel (13.0)	0	0	0	0.0
Subtotal, Pay Costs	473,821,000	481,299,000	7,478,000	1.6
Travel (21.0)	15,692,000	16,289,000	597,000	3.8
Transportation of things (22.0)	1,438,000	1,491,000	53,000	3.7
Rental payments to others (23.2)	549,000	570,000	21,000	3.8
Communications, utilities and miscellaneous charges (23.3)	9,552,000	10,003,000	451,000	4.7
Printing and reproduction (24.0)	2,519,000	2,639,000	120,000	4.8
Other Contractual Services:				
Advisory and assistance services (25.1)	16,377,000	17,001,000	624,000	3.8
Other services (25.2)	241,380,000	258,438,000	17,058,000	7.1
Purchases from government accounts (25.3)	373,795,000	387,707,000	13,912,000	3.7
Operation and maintenance of facilities (25.4)	30,219,000	32,817,000	2,598,000	8.6
Operation and maintenance of equipment (25.7)	15,985,000	17,189,000	1,204,000	7.5
Subsistence and support of persons (25.8)	0	0	0	0.0
Subtotal Other Contractual Services	677,756,000	713,152,000	35,396,000	5.2
Supplies and materials (26.0)	48,272,000	49,721,000	1,449,000	3.0
Subtotal, Non-Pay Costs	755,778,000	793,865,000	38,087,000	5.0
Total, Administrative Costs	1,229,599,000	1,275,164,000	45,565,000	3.7

**NATIONAL INSTITUTES OF HEALTH
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Authorizing Legislation

	PHS Act/ Other Citation	U.S. Code Citation	2010 Amount Authorized	FY 2010 Estimate	2011 Amount Authorized	FY 2011 PB
Research and Investigation	Section 301	42§241	Indefinite	\$5,101,666,000	Indefinite	\$5,264,643,000
	Section 402(a)	42§281	Indefinite		Indefinite	
National Cancer Institute						
Total, Budget Authority				5,101,666,000	5,264,643,000	

**NATIONAL INSTITUTES OF HEALTH
National Cancer Institute**

Appropriations History

Fiscal Year	Budget Estimate to Congress	House Allowance	Senate Allowance	Appropriation
2002	4,177,203,000 ¹	4,146,291,000	4,258,516,000	4,190,405,000
Rescission				(9,172,000)
2003	4,673,510,000 ¹	4,673,510,000	4,642,394,000	4,622,394,000
Rescission				(30,046,000)
2004	4,770,519,000 ¹	4,770,519,000	4,770,519,000	4,770,519,000
Rescission				(31,264,000)
2005	4,870,025,000 ¹	4,870,025,000	4,894,900,000	4,865,525,000
Rescission				(40,267,000)
2006	4,841,774,000 ¹	4,841,774,000	4,960,828,000	4,841,774,000
Rescission				(48,418,000)
2007	4,753,609,000 ¹	4,753,609,000	4,799,063,000	4,797,639,000
Rescission				0
2008	4,782,114,000 ¹	4,870,382,000	4,910,160,000	4,890,525,000
Rescission				(85,437,000)
Supplemental				25,559,000
2009	4,809,819,000 ¹	4,975,039,000	4,958,594,000	4,968,973,000
Rescission				0
2010	5,150,170,000 ¹	5,150,170,000	5,054,099,000	5,103,388,000
Rescission				0
2011	5,264,643,000			

1/ Reflects enacted supplementals, rescissions, and reappropriations.

2/ Excludes funds for HIV/AIDS research activities consolidated in the NIH Office of AIDS Research.

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Details of Full-Time Equivalent Employment (FTEs)

OFFICE/DIVISION	FY 2009 Actual	FY 2010 Enacted	FY 2011 PB
Office of the Director	778	787	823
Center for Cancer Research	1,499	1,517	1,586
Division of Cancer Biology	40	41	42
Division of Extramural Activities	85	86	90
Division of Cancer Treatment and Diagnosis	186	188	197
Division of Cancer Prevention	79	80	84
Division of Cancer Control and Population Sciences	130	132	137
Division of Cancer Epidemiology and Genetics	159	161	168
Total	2,956	2,992	3,127
Includes FTEs which are reimbursed from the NIH Roadmap for Medical Research			
FTEs supported by funds from Cooperative Research and Development Agreements			
	(8)	(8)	(8)
FISCAL YEAR	Average GM/GS Grade		
2007	12.0		
2008	12.0		
2009	12.0		
2010	12.0		
2011	12.0		

**NATIONAL INSTITUTES OF HEALTH
National Cancer Institute**

Detail of Positions

GRADE	FY 2009 Actual	FY 2010 Enacted	FY 2011 PB
Total, ES Positions	5	5	6
Total, ES Salary	803,575	823,022	1,001,453
GM/GS-15	238	241	252
GM/GS-14	409	414	433
GM/GS-13	375	380	397
GS-12	502	508	531
GS-11	178	180	188
GS-10	12	12	13
GS-9	150	152	159
GS-8	91	92	96
GS-7	82	83	87
GS-6	17	17	18
GS-5	6	6	6
GS-4	12	12	13
GS-3	4	4	4
GS-2	2	2	2
GS-1	0	0	0
Subtotal	2,078	2,103	2,199
Grades established by Act of July 1, 1944 (42 U.S.C. 207):			
Assistant Surgeon General	1	1	1
Director Grade	28	28	29
Senior Grade	9	9	9
Full Grade	15	15	16
Senior Assistant Grade	0	0	0
Assistant Grade	0	0	0
Subtotal	53	53	55
Ungraded	938	949	992
Total permanent positions	2,159	2,185	2,283
Total positions, end of year	3,077	3,114	3,254
Total full-time equivalent (FTE) employment, end of year	2,956	2,992	3,127
Average ES salary	160,715	164,604	166,909
Average GM/GS grade	12.0	12.0	12.0
Average GM/GS salary	93,517	95,780	97,121

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

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New Positions Requested

	FY 2011		
	Grade	Number	Annual Salary
Biologist	GS-12	31	\$90,231
Chemist	GS-12	4	\$94,110
Clinical Fellow	AD/602/0	8	\$84,123
Epidemiologist	GS-14	2	\$128,316
Health Scientist Administrator	GS-14	9	\$125,374
Medical Officer	GP-15	3	\$209,895
Microbiologist	GS-12	3	\$95,769
Nurse Specialist	GS-12	6	\$89,722
Research Chemist	RS/1320/0	2	\$191,030
Research Fellow	AD/401/0	6	\$82,187
Senior Investigator	AD/602/0	13	\$233,509
Investigator	AD/401/0	4	\$116,772
Staff Clinician	AD/602/0	2	\$174,093
Staff Scientist	AD/401/0	15	\$114,225
IT Specialist	GS-12	1	\$91,098
Contract Specialist	GS-13	2	\$106,836
Grant Management Specialist	GS-13	4	\$100,470
Public Health Advisor	GS-14	3	\$128,019
Program Analyst	GS-13	6	\$102,221
Administrative Officer	GS-12	8	\$82,946
Purchasing Agent	GS-8	3	\$56,505
Total Requested		135	