Fact Book

Fiscal Year

2006

NATIONAL INSTITUTES OF HEALTH
NATIONAL HEART, LUNG, AND BLOOD INSTITUTE

Fact Book

Fiscal Year

2006

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For Administrative Use

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National Heart, Lung,

and Blood Institute

NATIONAL INSTITUTES OF HEALTH
NATIONAL HEART, LUNG, AND BLOOD INSTITUTE

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1. Directory of Personnel*

Office of the Director	Bldg.	Room	Phone	MSC†‡
Director, **Elizabeth G. Nabel, M.D.**	31	5A48	496–5166	2486
Deputy Director, **Susan B. Shurin, M.D.**	31	5A48	496–1078	2486
Chief of Staff, **Sheila Pohl**	31	5A48	496–5166	2486
Associate Director for Administrative Management, **Donald P. Christoferson**	31	5A48	496–2411	2490
Administrative Officer, **Rebecca Ellett-Tenner**	31	5A21	496–5931	2490
Associate Director for Basic Research, **Alan M. Michelson, M.D., Ph.D.**	31	5A48	594–5353	2490
Associate Director for Minority Health Affairs, **Helena O. Mishoe, Ph.D., M.P.H.**	RKL2**	8184	451–5081	7913
Associate Director for Prevention, Education, and Control, **Gregory J. Morosco, Ph.D, M.P.H.**	31	4A10	496–5437	2480
Associate Director for Scientific Program Operation, **Carl A. Roth, Ph.D., LL.M.**	31	4A33	496–6331	2482
Associate Director for Research Informatics and Information Technology, **Charles P. Friedman, Ph.D.**	31	4A28	594–5657	2482
Deputy Ethics Counselor, **Nancy O'Hanlon, J.D.**	31	5A33	496–6471	2486
Office of Biostatistics				
Director, **Nancy L. Geller, Ph.D.**	RKL2	8210	435–0434	7938
Office of Clinical Research				
Associate Director, **Maria Stagnitto, M.S.N.**	RKL2	8295	435–7579	7940
Senior Advisor to the Director for Genome Research, **Christopher J. O'Donnell, M.D., M.P.H.**	73 Mt. Wayte Avenue, Suite 2 Framingham, MA 01702-5827 508–935–3435			
Special Assistant to the Director, **Carl E. Hunt, M.D.**	31	4A10	496–0554	2480
Center for Population Studies				
Director, **Daniel Levy, M.D.**	73 Mt. Wayte Avenue, Suite 2 Framingham, MA 01702-5827 508–935–3458			
Center for Research Informatics and Information Technology				
Director, **Charles P. Friedman, Ph.D.**	31	4A28	594–5657	2482
Deputy Director, **Ralph Van Wey**	RKL1§	6100	435–0119	7994
Administrative Officer, **Charlotte Wiltshire**	RKL2	8095	435–6373	7921
Planning, Architecture, Communication and Evaluation Branch				
Chief, **Carol A. Bean, Ph.D.**	RKL1	6112	425–0119	7994

* Current as of October 31, 2006. For locating personnel not listed, the general information number is 301–496–4000. All listed phone numbers are in area code 301. The Personnel Directory, which is periodically updated throughout the year, is located on the NHLBI Home Page under About NHLBI.

† MSC—Mail Stop Code.

‡ Full mailing address formats are located at the end of this chapter.

** RKL2—Rockledge II Building.

§ RKL1—Rockledge I Building.

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Chief, **Christopher E. Olaes**	RKL1	6212	496–3275	7994
Research and Biomedical Informatics Branch				
Acting Chief, **Charles P. Friedman, Ph.D.**	31	4A28	594–5657	2482
Ethics Office				
Director, **Nancy O'Hanlon, J.D.**	31	5A33	496–6471	2486
Ethics Coordinator, **Kim Brinson**	31	5A33	496–6471	2486
Office of Administrative Management				
Director/Executive Officer, **Donald P. Christoferson**	31	5A48	496–2411	2490
Deputy Executive Officer, **Timothy J. Wheele**	31	5A48	496–2411	2490
Administrative Officer, **Rebecca Ellett-Tener**	31	5A21	496–5931	2490
Management Policy and Administrative Services Branch				
Chief, **Marilyn Jackson**	31	5A21	496–5931	2490
Freedom of Information/Privacy Act				
Coordinator, **Suzanne Freeman**	RKL1	6070	496–9737	7957
Financial Management Branch				
Chief, **Sandra Gault**	31	5A34	496–4653	2490
Extramural Administrative Management Branch				
Chief, **Loretta L. Barnes**	RKL2	8095	435–6373	7921
Intramural Administrative Management Branch				
Chief, **Gary Unger**	10	7N220	451–0892	1670
Office of Workforce Relations				
Chief, **Mishyelle I. Croom**	RKL1	6070	496–1763	9757
Office of Minority Health Affairs				
Director, **Helena O. Mishoe, Ph.D., M.P.H.**	RKL2	8184	451–5081	7913
Deputy Director, **Chitra Krishnamurti, Ph.D.**	RKL2	8186	451–5081	7913
Administrative Officer, **James McKenzie**	RKL2	8095	435–6373	7921
Office of Prevention, Education, and Control				
Director, **Gregory J. Morosco, Ph.D., M.P.H.**	31	4A10	496–5437	2480
Administrative Officer, **Rebecca Ellett-Tener**	31	5A21	496–5931	2490
Health Communications and Information Sciences				
Senior Manager, **Terry C. Long**	31	4A10	496–0554	2480
International Programs				
Senior Manager, **Vacant**	31	4A10	496–5375	2480
Program Operation				
Senior Manager, **Nancy J. Poole, M.B.A.**	31	4A10	496–5437	2480
Public Health Program Development				
Senior Manager, **Robinson Fulwood, Ph.D., M.S.P.H.**	31	4A10	496–0554	2480
NHLBI Nutrition Coordinator,				
Darla E. Danford, D.Sc., M.P.H.	31	4A10	496–0554	2480
National High Blood Pressure Education Program				
Coordinator, **Edward J. Roccella, Ph.D., M.P.H.**	31	4A10	496–1051	2480
National Cholesterol Education Program				
Coordinator, **James I. Cleeman, M.D.**	31	4A10	496–1051	2480

Office of the Director (continued)	**Bldg.**	**Room**	**Phone**	**MSC**
National Asthma Education and Prevention Program				
Coordinator, **Diana K. Schmidt, M.P.H.**	31	4A10	496–1051	2480
National Obesity Education Initiative				
Coordinator, **Karen Donato, M.S.**	31	4A10	496–1051	2480
NHLBI Women's Heart Health Education Initiative				
Coordinator, **Ann Taubenheim, Ph.D., M.S.N.**	31	4A10	496–4236	2480
Pediatric Cardiovascular Risk Reduction and Science Application				
Senior Medical Officer, **Rae-Ellen Kavey, M.D., M.P.H.**	31	4A10	496–1051	2480
Office of Science and Technology				
Director, **Carl A. Roth, Ph.D., LL.M.**	31	4A33	496–6331	2482
Deputy Director, **Barbara Liu, M.S.**	31	4A33	496–9899	2482
Administrative Officer, **Rebecca Ellett-Tenner**	31	5A21	496–5931	2490
Program Studies and Reports Program				
Director, **Carl A. Roth, Ph.D., LL.M.**	31	4A33	496–6331	2482
Science and Special Issues Program				
Director, **Barbara Liu, M.S.**	31	4A33	496–9899	2482
Office of Public Liaison				
Acting Director, **Barbara Liu, M.S.**	31	4A33	496–9899	2482
Office of Technology Transfer and Development				
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Administrative Officer, **James McKenzie**	RKL2	8095	435–6373	7921
Division of Cardiovascular Diseases				
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Acting Deputy Director, **Susan E. Old, Ph.D.**	RKL2	9132	435–0477	7940
Special Assistant for Clinical Studies,				
David Gordon, M.D., Ph.D.	RKL2	9152	435–0477	7940
Administrative Officer, **Lisa A. Freeny**	RKL2	8095	435–6373	7921
Advanced Technologies and Surgery Branch				
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Heart Developmental and Structural Diseases Branch				
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Acting Deputy Chief, **Eser E. Tolunay, Ph.D.**	RKL2	10198	435–0560	7956
Office of Research Training and Career Development				
Director, **Jane Scott, Sc.D.**	RKL2	9135	435–0535	7940

Division of Lung Diseases	**Bldg.**	**Room**	**Phone**	**MSC**
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Deputy Director, **Carol E. Vreim, Ph.D.**	RKL2	10120	435–0233	7952
Administrative Officer, **Amy W. Sheetz**	RKL2	8095	435–6373	7921
Airway Biology and Disease Branch				
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Lung Biology and Disease Branch				
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National Center on Sleep Disorders Research				
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Division of Blood Diseases and Resources				
Office of the Director				
Director, **Charles Peterson, M.D., M.B.A.**	RKL2	10160	435–0080	7950
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Division of Prevention and Population Sciences				
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Acting Deputy Director, **Diane E. Bild, M.D., M.P.H.**	RKL2	8104	435–0422	7938
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Clinical Applications and Prevention Branch				
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Deputy Chief, **Lawrence J. Fine, M.D.**	RKL2	8138	435–0305	7936
Scientific Advisor, **Peter G. Kaufmann, Ph.D.**	RKL2	8118	435–2467	7936
Epidemiology Branch				
Chief, **Paul D. Sorlie, Ph.D.**	RKL2	8176	435–0707	7934
Deputy Chief, **Jean L. Olson, M.D., M.P.H.**	RKL2	8154	435–0707	7934
Deputy Chief, **Richard R. Fabsitz, Ph.D.**	RKL2	8164	435–0707	7934
Scientific Advisor, **Phyliss D. Sholinsky, M.S.P.H.**	RKL2	8168	435–0707	7934
Women's Health Initiative Branch				
Director, **Elizabeth G. Nabel, M.D.**	31	5A48	496–5166	2486
Chief, **Jacques E. Rossouw, Ph.D.**	RKL2	8160	402–2900	7934
Deputy Chief, **Shari Eason Ludlam, M.P.H.**	RKL2	8151	402–2900	7934
Administrative Officer, **Charlotte M. Wiltshire**	RKL2	8095	435–6373	7921
Division of Extramural Research Activities				
Office of the Director				
Director, **Stephen C. Mockrin, Ph.D.**	RKL2	7100	435–0260	7922

Division of Extramural Research Activities (continued)	**Bldg.**	**Room**	**Phone**	**MSC**
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Administrative Officer, **Veronica M. VanWagner**	RKL2	8095	435–6373	7921
Office of Acquisitions				
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Acting Deputy Director, **Pamela S. Lew**	RKL2	6016	435–0340	7902
Blood Diseases and Resources/NIAMS Branch				
Chief, **Joanna Magginas**	RKL2	6136	435–0355	7902
Epidemiology and Clinical Applications/Women's Health Initiative Branch				
Chief, **Paul McFarlane**	RKL2	6126	435–0345	7902
Heart, Lung, and Vascular Diseases Branch				
Chief, **Pamela S. Lew**	RKL2	6016	435–0340	7902
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Office of Extramural Policy and Review				
Director, **Paul A. Velletri, Ph.D.**	RKL2	7218	435–0260	7922
Review Branch				
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Office of Grants Management				
Director, **Suzanne A. White**	RKL2	7160	435–0144	7926
Deputy Director, **Raymond Zimmerman**	RKL2	7128	435–0144	7926
Blood Diseases and Resources Grants Management Section				
Chief, **Robert Vinson, Jr.**	RKL2	7156	435–0166	7926
Clinical and Molecular and Vascular Biology Grants Management Section				
Chief, **David Reiter**	RKL2	7172	435–0177	7926
Epidemiology and Clinical Application Grants Management Section				
Chief, **Teresa F. Marquette**	RKL2	7126	435–0177	7926
Heart Research and Training Grants Management Section				
Chief, **Mary S. Baylor**	RKL2	7146	435–0166	7926
Lung Diseases Grants Management Section				
Chief, **Robert A. Pike**	RKL2	7154	435–0166	7926
Office of Staff Training and Communication				
Director, **Robert A. Musson, Ph.D.**	RKL2	7210	435–0266	7922
Office of Strategic and Innovative Programs				
Director, **Susan E. Old, Ph.D.**	RKL2	7106	435–0260	7922
Division of Intramural Research				
Office of the Scientific Director				
Director, **Robert S. Balaban, Ph.D.**	10CRC*	4-1581	496–2116	1458
Intramural Administrative Management Branch				
Chief, **Gary Unger**	10	7N214	451–0892	1686
Office of the Clinical Director				
Director, **Richard O. Cannon III, M.D.**	10CRC	5-3330	496–9895	1454

*10CRC—Building 10 Clinical Research Center

Division of Intramural Research (continued)	**Bldg.**	**Room**	**Phone**	**MSC**
Office of Education				
Chief, **Herbert Geller, Ph.D.**	10	2N242	451–9440	1754
Cardiology Branch				
Chief, **Toren Finkel, M.D., Ph.D.**	10CRC	5-3330	402–4081	1454
Hematology Branch				
Chief, **Neal Young, M.D.**	10CRC	3-5140	496–5093	1202
Flow Cytometry Core				
Head, **Philip McCoy, Ph.D.**	10	4A07	451–8824	1357
Pulmonary Critical Care Medicine Branch				
Chief, **Joel Moss, M.D., Ph.D.**	10	6D03	496–1597	1590
Vascular Medicine Branch				
Chief, **Mark Gladwin, M.D.**	10CRC	5-5142	435–2310	1476
Microarray Core				
Head, **Nalini Raghavachari, Ph.D.**	10	7N108	435–2304	1662
Biochemistry and Biophysics Center				
Director, **Boon Chock, Ph.D.**	50	2134	496–2073	8012
Cell Biology and Physiology Center				
Director, **Edward D. Korn, Ph.D.**	50	2517	496–1616	8017
Bioinformatics and Systems Biology Core				
Head, **Eric Billings, Ph.D.**	10	4A15	496–6520	1348
Light Microscopy Core				
Head, **Christian Combs, Ph.D.**	10	6N309	496–3236	1623
Lipid Trafficking Core				
Head, **Edward Neufeld, Ph.D.**	10	5N107	496–5879	1424
Proteomics Core				
Head, **Rong-Fong Shen, Ph.D.**	10	8C213	594–1060	1597
Genetics and Development Biology Center				
Director, **Cecilia Lo, Ph.D.**	10	6C103A	451–8041	1583
Animal MRI/Imaging Core				
Head, **Stasia Anderson, Ph.D.**	10	2N240	401–0908	1518
Pathology Core				
Head, **Zu-Xi Yu, Ph.D.**	10	2N240	496–5035	1518
Transgenic Core				
Head, **Chengyu Liu, Ph.D.**	50	3305	435–5034	8018
Electron Microscopy Core				
Head, **Mathew Daniels, Ph.D.**	50	3318	496–2898	8017
Immunology Center				
Director, **Warren Leonard, M.D.**	10	7N252	496–0098	1674

NIH Mailing Address Formats

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Building 14E	Full Name NHLBI, NIH Building 14E, Room ____ 14 Service Road South MSC* ____ Bethesda, MD 20892–MSC†	Rockledge II Building	Full Name NHLBI, NIH Two Rockledge Center, Room ____ 6701 Rockledge Drive MSC* ____ Bethesda, MD 20817–MSC†
Building 31	Full Name NHLBI, NIH Building 31, Room ____ 31 Center Drive MSC*____ Bethesda, MD 20892–MSC†	Rockledge I Building	Full Name NHLBI, NIH One Rockledge Center, Room ____ 6705 Rockledge Drive MSC* ____ Bethesda, MD 20817–MSC†

* Retain the letters MSC before adding the mail stop code number.
† Replace the letters MSC with the mail stop code number.

2. Program Overview

The National Heart Institute (NHI) was established in 1948 through the National Heart Act with a mission to support research and training in the prevention, diagnosis, and treatment of cardiovascular diseases (CVD). Twenty-four years later, through section 413 of the National Heart, Blood Vessel, Lung, and Blood Act (P.L. 92–423), Congress mandated the Institute to expand and coordinate its activities in an accelerated attack against heart, blood vessel, lung, and blood diseases. The renamed National Heart, Lung, and Blood Institute (NHLBI) expanded its scientific areas of interest and intensified its efforts related to research on diseases within its purview. Over the years, these areas of interest have grown to encompass genetic, genomic, and proteomic research, systems biology, sleep disorders, and the Women's Health Initiative (WHI).

The mission of the NHLBI is to provide leadership for a national program in diseases of the heart, blood vessels, lung, and blood; sleep disorders; and blood resources management. The Institute:

- Plans, conducts, fosters, and supports an integrated and coordinated program of basic research, clinical investigations and trials, observational studies, and demonstration and education projects related to the causes, prevention, diagnosis, and treatment of heart, blood vessel, lung, and blood diseases, and sleep disorders conducted in its own laboratories and by other scientific institutions and individuals supported by research grants and contracts.
- Plans and directs research in development and evaluation of interventions and devices related to the prevention of heart, lung, and blood diseases and sleep disorders and the treatment and rehabilitation of patients who suffer from them.
- Conducts research on the clinical use of blood and all aspects of the management of blood resources.
- Supports career training and development of new and established researchers in fundamental sciences and clinical disciplines to enable them to conduct basic and clinical research related to heart, blood vessel, lung, and blood diseases; sleep disorders; and blood resources through individual and institutional research training awards and career development awards.
- Coordinates relevant activities with other research institutes and all Federal health programs in the above areas, including the causes of stroke.
- Conducts educational activities, including development and dissemination of materials for health professionals and the public in the above areas, with emphasis on prevention.
- Maintains continuing relationships with institutions and professional associations, and with international, national, state, and local officials, as well as voluntary agencies and organizations working in the above areas.
- Oversees management of the WHI.

Each year, the NHLBI assesses progress in the scientific areas for which it is responsible and updates its goals and objectives. As new opportunities are identified, the Institute expands and revises its areas of interest. Throughout the process, the approach used by the Institute is an orderly sequence of research activities that includes:

- Acquisition of knowledge
- Evaluation of knowledge
- Application of knowledge
- Dissemination of knowledge.

Over the past year, the Institute has undergone a major restructuring of its organization to better meet the challenge of its vision to be an international leader through support of innovative, creative, cutting edge research in heart, lung, blood, and sleep research. The reorganization was directed to strengthen scientific coordination by seeking specialized depth in specific disease areas, integrating basic research and clinical trials components, and emphasizing prevention and fostering population sciences. The Division of Heart and Vascular Diseases

(DHVD) and the Division of Epidemiology and Clinical Applications (DECA) were totally reorganized and subsequently renamed as the Division of Cardiovascular Diseases (DCVD) and the Division of Prevention and Population Sciences (DPPS), respectively. The Blood Resources Program in the Division of Blood Diseases and Resources (DBDR) was renamed the Transfusion Medicine and Cellular Therapeutics Branch. Framingham investigators were given intramural designation within the Office of Director. The National Center on Sleep Disorders Research (NCSDR) and the WHI were moved from the Office of the Director to the Division of Lung Diseases (DLD) and the DPPS, respectively.

The Office of the Director was augmented by the addition of (1) an Associate Director for Basic Research who is responsible for overseeing NHLBI basic science policies, developing and integrating basic sciences initiatives within the Institute, and coordinating these policies and programs with other NIH institutes and Federal agencies; (2) a Deputy Ethics Counselor who is responsible for managing the Institute's ethics program and serving as the authorizing official for all ethics clearances; (3) an Office of Biostatistics; (4) an Office of Clinical Research; (5) a Center for Research Informatics and Information Technology (CRIIT); and (6) a Center for Population Studies.

The Office of Biostatistics, which was located in the DECA, provides statistical expertise to the Institute and performs diverse functions in designing, implementing, monitoring, and analyzing NHLBI-sponsored studies. It is responsible for providing objective, statistically sound, and medically relevant solutions to problems arising in NHLBI-sponsored studies; developing new statistical methods for use in analyzing results from clinical trials, population studies, and environmental studies; and initiating research in theoretical biostatistics based upon trends in current research developments. Recently the Office has made contributions to statistical genetics and has extended its expertise to bioinformatics.

The Office of Clinical Research serves as the central clinical research office for extramural affairs. Its role is to coordinate regulatory activities associated with clinical research internally among NHLBI extramural Divisions and externally with NIH Institutes and other government agencies. The Office provides education and training for staff managing clinical research. Additionally, it coordinates and advises extramural scientific and health care staff, principal investigators, and research staff on issues related to all aspects of monitoring and regulatory compliance. The Office maintains central databases and policies and evaluates existing programs for standardizing data collection in clinical trials. It implements research informatics solutions and maintains surveillance over developments in designated areas of responsibility.

Center for Research Informatics and Information Technology

The CRIIT was established in June 2006 to provide an integrated informatics and knowledge environment for the NHLBI. It focuses on computing as it relates to the Institute's mission: conducting basic and clinical research, administering extramural research programs, and educating health care practitioners and the general public. The Center is organized into four branches:

- Research and Biomedical Informatics Branch
- Information Technology (IT) Resources Branch
- Applications Development and Support Branch
- Planning, Architecture, Communication, and Evaluation Branch.

Research and Biomedical Informatics Branch

The Research and Biomedical Informatics Branch develops computational methods to enhance the Institute's research mission, its administrative activities, and its education mission. Activities include designing an information and computing infrastructure to support clinical and translational research; providing bioinformatic support and standardizing terminology used in basic, translational, and clinical research; and providing guidance on complex modeling and analytics in bioinformatics, genomics, and proteomics and imaging.

IT Resources Branch

The IT Resources Branch is responsible for ensuring that the NHLBI personnel have continuous access to appropriate network resources needed to carry out the Institute's mission. It oversees the installation and maintenance of users' desktops, peripherals, and other computing hardware; assists individuals in optimal use of a defined collection of productivity tools; and ensures that all computer and user practices are compliant with NIH standards for information security.

Applications Development and Support Branch

The Applications Development and Support Branch provides or develops software engineering methods to address the high-priority needs of the Institute. The Branch keeps abreast of the evolving IT field to ensure that the Institute is current in the state-of-the-art of IT applications. It designs methods to allow the outside community to be able to access existing IT resources and educates users to take maximum advantage of these applications.

Planning, Architecture, Communication, and Evaluation Branch

The Planning, Architecture, Communication, and Evaluation Branch relies on a network of Constituency Groups to collect information relevant to the planning of all IT activities for the Institute. The Constituency Groups advise and assign priority to projects to be undertaken. Activities of the Branch include developing an information architecture that will be the blueprint for all future developments; evaluating deployed IT systems to determine their effectiveness and making improvements when necessary; designing methods to communicate with the NHLBI community, both internal and external, about relevant Institute activities; and developing methods to manage information relevant to the Institute's mission such as procedural knowledge (e.g., administrative practices) and scientific knowledge created by the Institute's programs.

Center for Population Studies

The Center for Population Studies conducts research using data from the NHLBI Framingham Heart Study to advance the understanding of the etiology, natural history, and temporal trends in heart, lung, and blood diseases and sleep disorders from various disciplines. It develops and oversees training in population research in heart, lung, and blood disorders; conducts collaborative scientific research with the Jackson Heart Study and other NHLBI population studies; and performs state-of-the-art research of heart, lung, blood, and sleep conditions with attention to early onset diseases, their biochemical milieu, and genetic susceptibility.

NHLBI Programs

The programs of the NHLBI, as shown on page 12, are implemented through four extramural units: the DCVD, the DLD, the DBDR, and the DPPS; and one intramural unit, the Division of Intramural Research (DIR). The extramural Divisions use a variety of funding mechanisms, such as research grants, cooperative agreements, program project grants, Small Business Innovation Research (SBIR) grants, Small Business Technology Transfer (STTR) grants, Specialized Centers of Research (SCORs) and Specialized Centers of Clinically Oriented Research (SCCORs) grants, comprehensive center grants, contracts, and research training and career development programs. Descriptions of the Divisions and the Office of Prevention, Education, and Control (OPEC) follow.

Division of Cardiovascular Diseases

The DCVD provides leadership for a national and international extramural program in CVD that integrates basic science and clinical research, including translational research, networks, and multicenter clinical trials. It designs, conducts, supports, and oversees research on the causes and prevention and treatment of diseases and disorders such as atherothrombosis, coronary artery disease, myocardial infarction (MI) and ischemia, heart failure, arrhythmia, sudden cardiac death, adult and pediatric congenital heart disease, cardiovascular complications of diabetes and obesity, and hypertension. It also supports and oversees research in vascular medicine and biology and valvular, cerebral, renal, peripheral, and other cardiovascular disorders. The DCVD fosters biotechnological research in genomics, proteomics, nanotechnology, imaging, device development, cell- and tissue-based therapeutics, and gene therapy, and in their uses as they relate to CVD. It also supports training and career development programs in cardiovascular research at all educational levels from high school students to academic faculty, including programs for individuals from diverse populations. SCORs support collaborative studies on molecular medicine and atherosclerosis medicine. SCCORs support clinical collaborative research in (1) cardiac dysfunction and disease, (2) pediatric heart development and disease, (3) vascular injury, repair, and remodeling.

The Division is organized into the five Branches and Office described below.

Advanced Technologies and Surgery Branch

The Advanced Technologies and Surgery Branch conducts and manages an integrated basic and clinical research program to study innovative and developing technologies for the diagnosis, prevention, and treatment

Programs Supported by the National Heart, Lung, and Blood Institute

Cardiovascular Diseases

Advanced Technologies and Surgery
Diagnostics Development
Emerging Therapeutics
Enabling Technologies
Surgery Advances

Atherothrombosis and Coronary Artery Disease
Acute and Chronic Coronary Syndromes
Acute and Silent Ischemia
Angina
Atherothrombosis
Coronary Artery Disease
Myocardial Infarction
Revascularization

Heart Developmental and Structural Disease
Adult Congenital Disease
Cardiac Immunology and Infection
Cardiovascular Development
Heart Transplantation
Pediatric Cardiovascular Disease
Valvular Heart Disease

Heart Failure and Arrhythmias
Arrhythmias
Heart Failure
Myocardial Protection
Resuscitation
Sudden Cardiac Death

Vascular Biology and Hypertension
Aneurysms
Cerebrovascular Disease
Hypertension
Lymphatic Diseases
Peripheral Vascular Disease
Renal Vascular Disease
Vascular Biology
Vascular Development and Angiogenesis

Lung Diseases

Airway Biology and Disease
Asthma
Chronic Obstructive Pulmonary Disease (COPD) and Environmental Lung Diseases
Cystic Fibrosis (CF)
Genetics, Genomics, and Biotechnology

Lung Biology and Disease
Acquired Immunodeficiency Syndrome (AIDS) and Tuberculosis (TB)
Critical Care and Acute Lung Injury
Developmental Biology and Pediatric Lung Disease
Immunology and Fibrosis
Lung Cell and Vascular Biology

National Center on Sleep Disorders Research
Sleep
Sleep Disorders and Related Conditions

Blood Diseases and Resources

Blood Diseases
Erythropoiesis
Red Cells
Sickle Cell Disease (SCD)
Thalassemia

Thrombosis and Hemostasis
Hematologic Immune Disorders
Hemophilia and Other Bleeding Disorders
Hemostasis
Thrombosis

Transfusion Medicine and Cellular Therapeutics
Hematopoietic Stem Cell Transplantation
Immune Deficiencies, Reconstitution, Response, and Tolerance
Myelodysplasia, Marrow Failure, and Myeloproliferative Disorders
Novel Cellular Therapies for Repair and Regeneration
Stem Cell Biology
Transfusion Medicine Use, Safety, and Availability of Blood and Blood Components

Prevention and Population Sciences

Clinical Applications and Prevention
Behavioral Medicine and Prevention
Clinical Prevention and Translation

Epidemiology
Analytical Resources
Field Studies and Clinical Epidemiology
Genetic Epidemiology

Women's Health Initiative

Intramural Research

Clinical Research
Cardiology
Cardiothoracic Surgery
Hematology
Pulmonary/Critical Care Medicine

Laboratory Research
Biochemical Genetics
Biochemistry
Cardiac Energetics
Cell Biology
Cell Signaling
Developmental Biology
Kidney and Electrolyte Metabolism
Molecular Cardiology
Molecular Immunology
Molecular Physiology

of CVD. It promotes opportunities to translate promising scientific and technological advances from discovery through preclinical studies to clinical trials. Areas supported by the Branch include:

- Diagnostics: proteomic, genomic, and other biomarker technologies and imaging modalities/agents to identify CVD and guide therapy.
- Therapeutics: tissue-, cell-, and gene-based/guided therapies; regenerative and reparative medicine; and devices for circulatory and cardiac support and repair.
- Surgery: improved surgical and image-guided approaches and evidence-based clinical research to advance promising new cardiovascular therapies, technologies, and surgical practices into clinical use.
- Enabling Technologies: bioinformatics, computational and systems biology, bioengineering, nanotechnology, materials research, and personalized medicine.

Atherothrombosis and Coronary Artery Disease Branch

The Atherothrombosis and Coronary Artery Disease Branch conducts and manages an integrated basic and clinical research program to study the etiology, pathogenesis, prevention, diagnosis, and treatment of coronary artery disease and atherothrombosis. It is responsible for translating promising scientific and technological advances from discovery through preclinical studies to networks and multisite clinical trials. Areas addressed by the Branch include:

- Atherothrombosis: initiation, progression, and regression of atherosclerotic lesions in coronary arteries and other arterial beds; lesion instability and thrombosis; risk factor mechanisms; interaction of lipid fractions and other systemic and humoral factors with the arterial wall; biomarker and imaging diagnostics to quantify atherosclerotic disease and its progression; vulnerable plaques and vulnerable patients; and diabetes, obesity, other metabolic disorders, and diet and exercise related to atherothrombosis.
- Coronary Artery Disease: acute and chronic coronary syndromes including myocardial infarction, acute ischemia and related events, angina, and silent ischemia; and percutaneous and surgical revascularization of stenotic and restenotic coronary lesions.

Heart Development and Structural Disease Branch

The Heart Development and Structural Disease Branch conducts and manages an integrated basic and clinical research program to study normal and abnormal cardiovascular development. It also is responsible for overseeing research related to the etiology, pathogenesis, prevention, diagnosis, and treatment of pediatric and adult structural heart disease. The Branch is a focal point for coordination of activities and development of educational materials related to clinical research on pediatric CVD within the NHLBI and the NIH. It promotes opportunities to translate promising scientific and technological advances from discovery through preclinical studies to network and multisite clinical trials. Areas supported by the Branch include:

- Heart Development: normal and abnormal cardiovascular development, molecular and genetic etiology of cardiovascular malformations, cardiomyogenic differentiation of stem cells, and gene-environment interactions in development of congenital heart disease.
- Structural Disease: congenital heart disease from embryology through adulthood, valve disease and determinants of degeneration, myocardial response to valvular disease, neurodevelopmental outcome in congenital heart disease, exercise physiology in congenital heart disease, pediatric cardiomyopathy and heart transplantation, and pediatric cardiac inflammation and infection.

Heart Failure and Arrhythmias Branch

The Heart Failure and Arrhythmias Branch conducts and manages an integrated basic and clinical research program to study normal cardiac function and pathogenesis to improve diagnosis, treatment, and prevention of heart failure and arrhythmias. It promotes opportunities to translate promising scientific and technological advances from discovery through preclinical studies to multisite and network clinical trials. Areas supported by the Branch include:

- Heart Failure: devices and medical and cell-based therapies targeting heart failure, myocardial protection, and pathogenesis and treatment of heart failure and cardiomyopathies.
- Arrhythmias: arrhythmogenesis, genetic and environmental bases of normal cardiac electrical activity and arrhythmias, etiology of rare and common arrhythmias, and sudden cardiac death.

- Myocardial Protection: myocardial preconditioning, amelioration and prevention of myocardial stunning and hibernation, and protection from ischemic/reperfusion injury.
- Resuscitation Science: mechanisms and management of clinical and experimental pathophysiologic states of whole body oxygen deprivation; systemic hypovolemia and resulting multiorgan failure; organ preservation; and cell, tissue, and organ protection during cardiac arrest and traumatic shock.

Vascular Biology and Hypertension Branch

The Vascular Biology and Hypertension Branch conducts and manages an integrated basic and clinical, extramural, research program to investigate vascular biology and the etiology, pathogenesis, prevention, diagnosis, and treatment of hypertension and vascular diseases. It promotes opportunities to translate promising scientific and technological advances from discovery through preclinical studies to networks and multisite clinical trials. Areas supported by the Branch include:

- Vascular Biology: biology of the vascular wall; vascular biology (related to hypertension; cerebrovascular, renal, and peripheral vascular disease; aneurysms; and lymphatic diseases); development of arteries, veins, lymphatics, and microcirculation; and angiogenesis.
- Vascular Medicine: cerebrovascular, renal, and peripheral vascular disease; and aneurysms.
- Hypertension: blood pressure regulation including central, renal, and vascular control and cerebrovascular disease resulting from high blood pressure.

Office of Research Training and Career Development

The Office of Research Training and Career Development supports training and career development programs in cardiovascular research, offering opportunities to individuals at all educational levels from high school students to academic faculty, including programs for individuals from diverse populations. The programs promote opportunities for investigators, early in their research careers and under mentorship from senior scientists, to perform basic, preclinical or clinical cardiovascular research and to take emerging and promising scientific and technological advances from discovery through preclinical and clinical studies. The Office also collaborates with the scientific community and professional organizations to ensure that training programs meet both the current and future needs of the cardiovascular research workforce. Programs supported by the Office include:

- Institutional and individual research training programs and fellowships for training of promising cardiovascular scientists at the predoctoral, postdoctoral, junior faculty, and established investigator levels
- Diversity Supplements to ongoing research grants for support of young investigators from diverse backgrounds, from the high school to the junior faculty level
- The Pathway to Independence Program, which allows the recipient to bridge the gap between a career development award and a research award
- Career development programs specifically designed for clinical research or for minority researchers and institutions.

Division of Lung Diseases

The DLD plans and directs a coordinated research program on the causes and progression of lung diseases and sleep disorders including their prevention, diagnosis, and treatment. It supports basic research, clinical trials, national pulmonary centers, technological development, and application of research findings. Areas of interest include the biology and function of the respiratory system, fundamental mechanisms associated with specific pulmonary disorders, and development of new treatment strategies for patients. SCORs support collaborative studies on airway biology and pathogenesis of CF; cellular and molecular mechanisms of asthma; pathobiology of lung development; pathobiology of fibrotic lung disease; and neurobiology of sleep and sleep apnea. SCCORs support collaborative studies on translational research in acute lung injury and host factors in chronic lung diseases. Other important activities supported by the Division include demonstration and education projects to transfer basic research and clinical findings to health care professionals and patients and training and career development programs for individuals interested in furthering their professional abilities in lung diseases research. The DLD, through the NCSDR, also coordinates sleep research activities across the NIH, other Federal agencies, and outside organizations.

The Division is organized into three major research branches:

- Airway Biology and Disease Branch
- Lung Biology and Disease Branch
- NCSDR.

Airway Biology and Disease Branch

The Airway Biology and Disease Branch supports research and research training in asthma, COPD, CF, and airway function in health and disease. Basic research focuses on elucidating the etiology and pathophysiology of the diseases. Clinical studies focus on improving asthma management and reducing health disparities in asthma; improving COPD treatment and management; and developing genetic, pharmacologic, and nonpharmacologic (e.g., gene transfer) treatments for CF.

Lung Biology and Disease Branch

The Lung Biology and Disease Program supports research, education, and training programs in lung cell and vascular biology; developmental biology and pediatric lung diseases; acute lung injury and critical care medicine; and interstitial lung diseases and lung immunology including pulmonary fibrosis, sarcoidosis, and pulmonary manifestations of human immunodeficiency virus (HIV)/AIDS and associated infections with emphasis on active and latent TB and drug-resistant TB. Basic research focuses on lung development and cell biology, including stem cell biology and cell-based therapies, and mechanisms of disease etiology and pathogenesis. Clinical studies focus on evaluating innovative therapies for acute lung injury and acute respiratory distress syndrome (ARDS), pulmonary fibrosis, neonatal lung disease, pulmonary embolism, and pulmonary hypertension.

National Center on Sleep Disorders Research

The NCSDR plans, directs, and supports basic, clinical, and applied research, health education, training, and prevention research in sleep, chronobiology, and sleep disorders. It oversees developments in its program areas; assesses the national needs for research on causes, diagnosis, treatment, and prevention of sleep disorders and sleepiness; and coordinates sleep research activities across the Federal Government and with professional, voluntary, and private organizations. The Center promotes information sharing and coordinates implementation of interagency programs.

The NHLBI sleep research program seeks to understand the molecular, genetic, and physiological regulation of sleep and the relationship of sleep disorders to CVD. It also supports efforts to understand the relationships of sleep restriction and sleep-disordered breathing to the metabolic syndrome, including obesity, high blood pressure and stroke, dyslipidemia, insulin resistance, and vascular inflammation. Ongoing NHLBI-funded research projects include elucidating the etiology and pathogenesis of sleep disorders, particularly sleep apnea; determining the role of sleep apnea in CVD and cerebrovascular disease; examining sleep and sleep disorders across the lifespan; and identifying new animal models of sleep disorders.

Division of Blood Diseases and Resources

The DBDR plans and directs research and research training on the causes and prevention of blood diseases and disorders. Areas of interest encompass a broad spectrum of research from stem cell biology to medical management of blood diseases, with a focus on nonmalignant and premalignant processes. It recently has taken a leading role in developing cell-based therapies, combining the expertise of transfusion medicine and stem cell technology with the exploration of repair and regeneration of human tissues and biological systems. SCCORs and other specialized centers support collaborative clinical research in hemostatic and thrombotic disorders, SCD, transfusion biology and medicine, and cell-based therapy for blood diseases. The Division also has a major responsibility to improve the adequacy and safety of the Nation's blood supply.

The Division is organized into three major branches:

- Blood Diseases Branch
- Thrombosis and Hemostasis Branch
- Transfusion Medicine and Cellular Therapeutics Branch.

Blood Diseases Branch

The Blood Diseases Branch supports research and research training in nonmalignant disorders of the hematopoietic system including SCD and thalassemia. Attention is focused on reducing morbidity and mortality caused by the disorders and preventing their occurrence.

Research in SCD and thalassemia ranges from elucidating their etiology and pathophysiology to improving disease treatment and management. Areas of emphasis include genetics, regulation of hemoglobin synthesis, iron chelation, development of drugs to increase fetal hemoglobin production, and gene therapy. Developing animal models for preclinical studies is another area of interest. Clinical studies in SCD are investigating stroke prevention and the long-term effects of hydroxyurea therapy. A Phase III clinical trial is determining whether hydroxyurea is effective in preventing chronic end organ damage in children with SCD.

The Branch oversees a program of Comprehensive Sickle Cell Centers, which collectively form a SCD clinical research network—and which individually conduct basic and clinical research—and provide state-of-the-art patient care, educational activities for patients and health professionals, community outreach, and genetic counseling services.

A thalassemia clinical network is evaluating new treatment strategies and ensuring that research findings on optimal management of the disease are rapidly disseminated to practitioners and health care professionals.

Thrombosis and Hemostasis Branch

The Thrombosis and Hemostasis Branch supports research and research training in hemostasis, thrombosis, and endothelial cell biology. It oversees a comprehensive program of basic research, clinical studies, and technology development focusing on understanding the pathogenesis of both arterial and venous thrombosis in order to improve the diagnosis, prevention, and treatment of thrombosis in heart attack, stroke, and peripheral vascular diseases. A major goal is to find additional platelet inhibitors, anticoagulants, and fibrinolytic agents that will improve specificity and reduce side effects when used in treatment of thrombotic and thromboembolic disorders.

The Branch also supports research on bleeding disorders (e.g., hemophilia and von Willebrand disease) and immune disorders (e.g., idiopathic thrombocytopenic purpura, thrombotic thrombocytopenic purpura, and systemic lupus erythematosus). Emerging areas of interest are gene transfer, clinical proteomics, inflammation and thrombosis, stroke, coagulation activation, autoimmune disease, and thrombotic complications of obesity, diabetes, and cancer.

Transfusion Medicine and Cellular Therapeutics Branch

The Transfusion Medicine and Cellular Therapeutics Branch plans and directs research and research training in transfusion medicine, stem cell biology and disease, and clinical cellular medicine. It supports research on the use, safety, and availability of blood and blood components for transfusion and cellular therapies. Research areas include transmission of disease, noninfectious complications of transfusions, immunobiology, cell biology and disease, cell-based therapies, hematopoietic stem cell transplantation, and overall product availability.

The Branch develops programs for basic and clinical research related to normal and abnormal cellular biology and pathology. It also collaborates with governmental, private sector, and international organizations to improve the safety and availability of the global supply of blood and blood components.

Division of Prevention and Population Sciences

The DPPS supports and provides leadership for population- and clinic-based research on the causes, prevention, and clinical care of cardiovascular, lung, and blood diseases and sleep disorders. Research includes a broad array of epidemiological studies to describe disease and risk factor patterns in populations and to identify risk factors for disease; clinical trials of interventions to prevent disease; studies of genetic, behavioral, sociocultural, and environmental influences on disease risk and outcomes; and studies of the application of prevention and treatment strategies to determine how to improve clinical care and public health. The Division also supports training and career development for these areas of research.

The Division is organized into three major branches:

- Clinical Applications and Prevention Branch
- Epidemiology Branch
- WHI Branch.

Clinical Applications and Prevention Branch

The Clinical Applications and Prevention Branch supports, designs, and conducts research, and supports training, on behavioral, environmental, clinical, and health care approaches to reduce occurrence and consequences of CVD. Prevention research examines effects

of interventions to slow or halt risk factor or disease development or progression; interventions use high-risk individual and population approaches, including medications, behavioral strategies, and environmental change. Studies examine lifestyle, nutrition and exercise, psychological and sociocultural factors, and environmental and genetic influences relevant to prevention. Clinical application research examines approaches to improve health care delivery and patient outcomes. Studies include clinical and community trials and selected observational studies.

Epidemiology Branch

The Epidemiology Branch supports, designs, and conducts research, and supports training, in the epidemiology of cardiovascular, lung, and blood diseases and sleep disorders. Studies are conducted to identify temporal trends and population patterns in the prevalence, incidence, morbidity, and mortality from the diseases and include single- and multicenter observational epidemiology studies of development, progression, and treatment of cardiovascular, lung, and blood diseases and sleep disorders. Studies identify environmental, lifestyle, physiological, and genetic risk factors for disease and risk factor development including characterization of gene–gene and gene–environment interactions. The Branch also distributes data from all eligible NHLBI studies to researchers as a national data resource and adheres to guidelines that protect participant privacy and confidentiality.

WHI Branch

The WHI Branch supports clinical trials and observational studies to improve the understanding of the causes and prevention of major diseases affecting the health of women. Current studies focus on CVD, cancer, and fractures, in collaboration with National Cancer Institute (NCI), National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS), National Institute on Aging (NIA), National Institute of Neurological Disorders and Stroke (NINDS), and Office of Research on Women's Health (ORWH). Large, multicenter, observational epidemiology studies seek to identify risk markers for disease or better quantify known markers using questionnaire, clinical examination, and laboratory data. The large and long-term multicenter clinical trials test promising but unproven interventions such as hormone therapy, diet, and supplements to prevent major diseases and evaluate overall effects on health. The Branch has established an infrastructure to support the use of data and blood samples from the studies by the scientific community.

Division of Intramural Research

The DIR conducts laboratory and clinical research in heart, vascular, lung, blood, and kidney diseases and develops technology related to cardiovascular and pulmonary diseases. Areas of interest include the biology of experimental and clinical arteriosclerosis and its manifestations; pathophysiology of hypertensive vascular disease; functions of the lung; clinical and experimental studies on physiologic and pharmacologic aspects of heart, lung, and blood diseases; and a broad program of other basic research and technical development related to them.

In fiscal year (FY) 2005, the DIR was reorganized. The Office of the Director, Laboratory Research Program, became the Office of the Scientific Director, and the Office of the Director, Clinical Research Program, became the Office of the Clinical Director, which was subsumed within the Office of the Scientific Director. Clinical branches and their laboratories and sections were abolished and four new branches were established: the Cardiovascular Branch, the Hematology Branch, the Pulmonary Critical Care Medicine Branch, and the Vascular Medicine Branch.

The reorganized DIR includes the following four centers and four branches:

Biochemistry and Biophysics Center

The Biochemistry and Biophysics Center develops a global view of the molecular basis of structure–function relationships of proteins and biologically relevant molecules. It performs state-of-the-art nuclear magnetic resonance (NMR) spectroscopy studies of protein structure and functional interactions, develops mathematical tools for generating theoretical models of protein structure–function relationships, elucidates the mechanisms of enzyme function, and investigates the relationship between protein structure–function relationships and cell signaling pathways.

Cell Biology and Physiology Center

The Cell Biology and Physiology Center develops a global view of the mechanisms that regulate cellular function and physiology. It evaluates the mechanisms

that control different molecular machines within the cytosol, including those involved in muscle contraction, and cytosolic and membrane transport processes. The Center studies cellular signaling events associated with hormone action, cytosolic trafficking, and energy metabolism; investigates the role of cellular processes on function and adaptation in whole animal model systems; and develops unique measuring devices for studying biochemical and physiological processes in intact cells, whole animals, and clinical situations.

Genetics and Development Biology Center

The Genetics and Development Biology Center develops a global view of the mechanisms that regulate cardiovascular development and the etiology of congenital heart anomalies and CVD. It evaluates the function of specific genes and transcription factors in the development of the heart and other tissues, develops techniques and approaches for gene delivery and gene therapy in model systems, and works toward a better understanding of basic processes involved in regulating and interpreting the genetic code in development and disease.

Immunology Center

The Immunology Center develops a global view on the molecular basis of immune processes. It studies the intracellular and signaling processes involved in the activation of lymphocytes and mast cells, investigates the mechanisms by which drugs and other agents result in allergic-autoimmune reactions, and relates the results to the development of new diagnostic and therapeutic approaches in humans.

Cardiovascular Branch

The Cardiovascular Branch develops diagnostic and therapeutic modalities for the treatment of CVD. It investigates laboratory-based mechanistic studies and innovative clinical protocols.

Hematology Branch

The Hematology Branch conducts basic and clinical research on normal and abnormal hematopoiesis. Areas of interest include bone marrow failure, viral infections of hematopoietic cells, gene therapy of hematologic and malignant diseases, bone marrow transplantation, and mechanisms of immunologically mediated syndromes such as graft-versus-host disease and autoimmune diseases.

Pulmonary Critical Care Medicine Branch

The Pulmonary Critical Care Medicine Branch conducts research on the lung and cardiovascular system directed at defining, on the molecular level, normal function and disease. It focuses on the integration of biochemical, molecular, biological, and immunological events into an understanding of intra- and intercellular communications and organ function.

Vascular Medicine Branch

The Vascular Medicine Branch conducts research on the lung and vasculature directed at defining, on a molecular, biochemical, and functional level, normal physiological function and novel mechanisms of disease. It focuses on translational study and therapeutic modulation of these functions to mitigate vasculopathy in lung and heart disease.

Office of Prevention, Education, and Control

The Institute's OPEC coordinates the translation and dissemination of research findings and scientific consensus to health professionals, patients, and the public, so that information can be adapted for, and integrated into, health care practice and individual health behavior. The Office also coordinates NHLBI international programs and activities. NHLBI health education programs and initiatives established through the OPEC address high blood pressure, high blood cholesterol, asthma, early warning signs of heart attack, obesity, and sleep disorders. For reducing high blood pressure, high blood cholesterol, and obesity, two approaches are used: one focuses on individuals at high risk and the other on the general public. Special attention is given to minority populations that are disproportionately affected by disorders within the Institute's mandate.

The four largest education programs have coordinating committees consisting of national medical, public health, and voluntary organizations and other Federal agencies, which help to plan, implement, and evaluate the Institute's professional, patient, and public education programs.

The National High Blood Pressure Education Program (NHBPEP) was initiated in 1972 to reduce death and disability related to high blood pressure. It employs a comprehensive strategy to mobilize, educate, and coordinate groups concerned with hypertension prevention and control. Major activities include developing and

disseminating educational materials and programs that are grounded in a strong science base.

The National Cholesterol Education Program (NCEP) was initiated in 1985 to educate health professionals and the public about high blood cholesterol as a risk factor for coronary heart disease (CHD) and about the benefits of lowering cholesterol levels to reduce illness and death from CHD. Its goal is to reduce the prevalence of elevated blood cholesterol in the United States and thereby contribute to reducing CHD morbidity and mortality.

The National Asthma Education and Prevention Program (NAEPP) was initiated in 1989 to raise awareness of asthma as a serious, chronic disease; to promote more effective management of asthma through professional, patient, and public education; and to provide up-to-date information on asthma care. It employs a number of outreach strategies. Major emphasis is placed on developing, disseminating, and implementing national guidelines on the diagnosis and management of asthma. The Program works with schools, health care professionals, and patients to improve asthma care, prevent disruptions of daily routine, limit hospitalizations, and reduce deaths caused by uncontrolled asthma. Special attention is directed to minority, low-income, and underserved populations who are at increased risk.

The National Heart Attack Alert Program (NHAAP) was initiated in 1991 to reduce morbidity and mortality from heart attack, including out-of-hospital cardiac arrest, through education of health care providers, patients, and the public, about the importance of rapid identification and treatment of individuals with heart attack symptoms. In 1997, the Program's scope was broadened to include early identification and treatment of individuals with unstable angina, thereby including the full spectrum of acute coronary syndromes.

The NHLBI Obesity Education Initiative (OEI) was launched in 1991 to reduce the prevalence of overweight, obesity, and physical inactivity in order to lower the risk and overall morbidity and mortality from CHD. In addition, reducing the prevalence of overweight/obesity will help to prevent or improve other diseases and conditions such as type 2 diabetes and sleep apnea.

Because of the association of obesity and physical inactivity with the various risk factors for CVD as well as impaired lung function, the OEI helps to enhance and integrate education activities related to both weight and physical activity. One such program, conducted in collaboration with the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), the National Institute of Child Health and Human Development (NICHD), and the NCI, is "We Can!," a national public education program designed to address the dramatic increase in overweight and obesity in children. The program targets youth, ages 8–13, and their parents or primary caregivers in home and community settings to help prevent obesity.

The NCSDR works closely with the OPEC on education pertaining to sleep problems and sleep disorders for physicians, other health care providers, and the general public. Reaching children and adolescents with messages about sleep and sleep disorders is a priority. The NCSDR and Garfield the Cat have teamed up to provide sleep education information for kids, parents, teachers, and pediatricians on the Garfield Star Sleeper Web site.

The NHLBI, along with its partner organizations, launched *The Heart Truth* campaign in 2002 to make women more aware of the danger of heart disease. The campaign, which uses a red dress as a national symbol for women and heart disease awareness, is especially aimed at women ages 40 to 60, the time when a woman's heart disease risk starts to rise. It also targets women of color because they have high rates of the major risk factors for heart disease, such as obesity, physical inactivity, high blood pressure, and diabetes.

The Institute has undertaken educational activities in peripheral arterial disease, COPD, and von Willebrand disease. A campaign designed to educate the public about the signs and symptoms of peripheral arterial disease and its risk factors and to encourage those at risk to seek diagnosis and treatment was launched on September 19. A COPD awareness and education campaign targeting patients, those at risk, and health care providers will be launched in FY 2007.

The OPEC is also responsible for coordinating the Institute's nutrition program. The NHLBI Nutrition Coordinator serves as a major source of nutrition policy and nutrition science knowledge and advises the NHLBI Director on nutrition program policies and priorities. In addition, the Coordinator is the Institute's representative to other relevant components of the NIH, the U.S. Department of Health and Human Services (HHS), and

other components of the Federal Government on nutrition research and policy.

The NHLBI supports several outreach education programs that target blacks and ethnic minorities who are disproportionately affected by heart disease. One such program, "Enhanced Dissemination and Utilization Centers" (EDUCs), focuses on high-risk communities and seeks to eliminate cardiovascular health disparities and improve the health of underserved populations. The "Salud para su Corazón" (Health for Your Heart) initiative is a community-based heart health program for Latinos that uses trained local lay health workers *(promotores de salud)* applying the values and culture of the community to teach individuals and patients how to reduce their risk of developing CVD. American Indian and Alaska Native (AI/AN) communities and Asian American and Pacific Islanders are additional populations that receive special attention. Programs specifically directed and culturally sensitive emphasize the importance of good heart health.

The NHLBI initiated the "Keep the Beat" program in 2004 to promote heart healthy behaviors for its employees and to encourage them to become more physically active. A key component of the program was the introduction of onsite "Take 10" rooms where employees can go to use 10–15 minutes of their daily break time to participate in a low-impact physical activity of their choice.

In FY 2006, based on a recommendation from participants attending the CVD Thought Leaders meeting, the OPEC is seeking to assemble its CVD education and outreach programs and initiatives into a Cardiovascular Knowledge Network and to establish integrated CVD guidelines that will enable clinicians and patients to address all of the risk factors contributing to CVD risk.

The Institute's international programs support a number of global activities to promote research, research training, and improved health within its mandate. Activities include providing training in its laboratories to international research fellows from approximately 30 countries; collaborating with the Institute of Circulatory and Respiratory Health, Canadian Institutes of Health Research (CIHR), on cardiovascular, pulmonary, and blood diseases research; conducting epidemiologic, laboratory, and survey research on blood donors in selected developing countries in regions seriously affected by the HIV/AIDS epidemic; and partnering with the Pan American Health Organization (PAHO) and the World Health Organization (WHO) to address the pandemic of CVD in North, Central, and South America and the Caribbean.

The NHLBI supports efforts to encourage collaboration and research on rare diseases. It is working with Ghana to compare the differences in epidemiology and etiology of infections in SCD between Africa and the United States; supporting clinical studies on Cooley's anemia in the United Kingdom; and initiating research into the genetics and basic mechanisms of Diamond-Blackfan anemia and other rare inherited bone marrow failure syndromes with Australia, Canada, and Sweden.

All of these activities strengthen the Institute's international partnerships and coalitions and extend the benefits of the Institute's research, prevention, and treatment programs to other countries.

3. Important Events

June 16, 1948. President Harry S Truman signs the National Heart Act, creating the NHI in the Public Health Service (PHS), with the National Advisory Heart Council as its advisory body.

July 7, 1948. Dr. Paul Dudley White is selected to be "Executive Director of the National Advisory Heart Council and Chief Medical Advisor to the National Heart Institute" under section 4b of the National Heart Act.

August 1, 1948. The NHI is established as an institute of the NIH by Surgeon General Leonard A. Scheele. As legislated in the National Heart Act, the NHI assumes responsibility for heart research, training, and administration. Intramural research projects in CVD and gerontology conducted elsewhere in the NIH are transferred to the NHI. The Director of the NHI assumes all leadership for the total PHS heart program. Dr. Cassius J. Van Slyke is appointed as the first Director of the NHI.

August 29, 1948. Surgeon General Scheele announces the membership of the first National Advisory Heart Council. Varying terms of membership for the 16-member Council commence September 1.

September 8, 1948. The National Advisory Heart Council holds its first meeting.

January 1949. Cooperative Research Units are established at four institutions: the University of California, the University of Minnesota, Tulane University, and Massachusetts General Hospital. Pending completion of the NHI's own research organization and facilities, the Units are jointly financed by the NIH and the institutions.

July 1, 1949. The NHI Intramural Research Program is established and organized on three general research levels consisting of three laboratory sections, five laboratory–clinical sections, and four clinical sections. The Heart Disease Epidemiology Study at Framingham, Massachusetts, is transferred from the Bureau of State Services, PHS, to the NHI.

January 18–20, 1950. The NHI and the American Heart Association jointly sponsor the first National Conference on Cardiovascular Diseases to summarize current knowledge and to make recommendations concerning further progress against heart and blood vessel diseases.

December 1, 1952. Dr. James Watt is appointed Director of the NHI, succeeding Dr. Van Slyke, who is appointed Associate Director of the NIH.

July 6, 1953. The Clinical Center admits its first patient for heart disease research.

July 1, 1957. The first members of the NHI Board of Scientific Counselors begin their terms. The Board was established in 1956 "to provide advice on matters of general policy, particularly from a long-range viewpoint, as they relate to the intramural research program."

February 19, 1959. The American Heart Association and the NHI present a report to the Nation—*A Decade of Progress Against Cardiovascular Disease*.

April 21, 1961. The President's Conference on Heart Disease and Cancer, whose participants on March 15 were requested by President John F. Kennedy to assist "in charting the Government's further role in a national attack on these diseases," convenes at the White House and submits its report.

September 11, 1961. Dr. Ralph E. Knutti is appointed Director of the NHI, succeeding Dr. Watt, who becomes head of international activities for the PHS.

December 30, 1963. February is designated as "American Heart Month" by a unanimous joint resolution of Congress with approval from President Lyndon B. Johnson.

November 22–24, 1964. The Second National Conference on Cardiovascular Diseases, cosponsored by the American Heart Association, the NHI,

and the Heart Disease Control Program of the PHS, is held to evaluate progress since the 1950 Conference and to assess needs and goals for continued and accelerated growth against heart and blood vessel diseases.

December 9, 1964. The President's Commission on Heart Disease, Cancer, and Stroke, appointed by President Johnson on March 7, 1964, submits its report to "recommend steps that can be taken to reduce the burden and incidence of these diseases."

August 1, 1965. Dr. William H. Stewart assumes the Directorship of the NHI upon Dr. Knutti's retirement.

September 24, 1965. Dr. William H. Stewart, NHI Director, is named Surgeon General of the PHS.

October 6, 1965. In FY 1966, Supplemental Appropriations Act (P.L. 89–199) allocates funds to implement the recommendations of the President's Commission on Heart Disease, Cancer, and Stroke that are within existing legislative authorities. The NHI is given $5.05 million for new clinical training programs, additional graduate training grants, cardiovascular clinical research centers on cerebrovascular disease and thrombotic and hemorrhagic disorders, and planning grants for future specialized cardiovascular centers.

March 8, 1966. Dr. Robert P. Grant succeeds Dr. Stewart as Director of the NHI. Dr. Grant serves until his death on August 15, 1966.

November 6, 1966. Dr. Donald S. Fredrickson is appointed Director of the NHI.

March 15, 1968. Dr. Theodore Cooper succeeds Dr. Fredrickson as Director of the NHI, the latter electing to return to research activities with the Institute.

October 16, 1968. Dr. Marshall W. Nirenberg is awarded a Nobel Prize in Physiology or Medicine for discovering the key to deciphering the genetic code. Dr. Nirenberg, chief of the NHI Laboratory of Biochemical Genetics, is the first Nobel Laureate at the NIH and the first Federal employee to receive a Nobel Prize.

October 26, 1968. The NHI receives the National Hemophilia Foundation's Research and Scientific Achievement Award for its "medical leadership . . . , tremendous stimulation and support of research activities directly related to the study and treatment of hemophilia."

November 14, 1968. The 20th anniversary of the NHI is commemorated at the White House under the auspices of President Johnson and other distinguished guests.

August 12, 1969. A major NHI reorganization plan creates five program branches along disease category lines in extramural programs (arteriosclerotic disease, cardiac disease, pulmonary disease, hypertension and kidney diseases, and thrombotic and hemorrhagic diseases); a Therapeutic Evaluations Branch and an Epidemiology Branch under the Associate Director for Clinical Applications; and three offices in the Office of the Director (heart information, program planning, and administrative management).

November 10, 1969. The NHI is redesignated by the Secretary, Health, Education, and Welfare (HEW), as the National Heart and Lung Institute (NHLI), reflecting a broadening scope of its functions.

February 18, 1971. President Richard M. Nixon's Health Message to Congress identifies sickle cell anemia as a high-priority disease and calls for increased Federal expenditures. The Assistant Secretary for Health and Scientific Affairs, HEW, is assigned lead-agency responsibility for coordination of the National Sickle Cell Disease Program at the NIH and NHLI.

June 1971. The Task Force on Arteriosclerosis, convened by Dr. Cooper, presents its report. Volume I addresses general aspects of the problem and presents the major conclusions and recommendations in nontechnical language. Volume II contains technical information on the state of knowledge and conclusions and recommendations in each of the following areas: atherogenesis, presymptomatic atherosclerosis, overt atherosclerosis, and rehabilitation.

May 16, 1972. The National Sickle Cell Anemia Control Act (P.L. 92–294) provides for a national diagnosis, control, treatment, and research program. The Act does not mention the NHLI but has special pertinence because the Institute has been designated to coordinate the National Sickle Cell Disease Program.

June 12, 1972. Elliot Richardson, Secretary, HEW, approves a nationwide program for high blood pressure information and education and appoints two committees to implement the program: the Hypertension Information and Education Advisory Committee, chaired by the Director, NIH, and the Interagency Working Group,

chaired by the Director, NHLI. A High Blood Pressure Information Center is established within the NHLI Office of Information to collect and disseminate public and professional information about the disease.

July 1972. The NHLI launches its NHBPEP, a program of patient and professional education that has as its goal to reduce death and disability related to high blood pressure.

July 14, 1972. Secretary Richardson approves reorganization of the NHLI, with the Institute elevated to Bureau status within the NIH and comprising seven division-level components: Office of the Director, DHVD, DLD, DBDR, DIR, Division of Technological Applications, and Division of Extramural Affairs (DEA).

September 19, 1972. The National Heart, Blood Vessel, Lung, and Blood Act of 1972 (P.L. 92–423) expands the authority of the Institute to advance the national attack on the diseases within its mandate. The act calls for intensified and coordinated Institute activities to be planned by the Director and reviewed by the National Heart and Lung Advisory Council.

July 24, 1973. The first Five-Year Plan for the National Heart, Blood Vessel, Lung, and Blood Program is transmitted to the President and to Congress.

December 17, 1973. The National Heart and Lung Advisory Council completes its First Annual Report on the National Program.

February 13, 1974. The Director of the NHLI forwards his First Annual Report on the National Program to the President for transmittal to Congress.

April 5, 1974. The Assistant Secretary for Health, HEW, authorizes release of the Report to the President by the President's Advisory Panel on Heart Disease. The report of the 20-member panel, chaired by Dr. John S. Millis, includes a survey of the problem of heart and blood vessel disorders and panel recommendations to reduce illness and death from them.

August 2, 1974. The Secretary, HEW, approves regulations governing the establishment, support, and operation of National Research and Demonstration Centers for heart, blood vessel, lung, and blood diseases, which implement section 415(b) of the PHS Act, as amended by the National Heart, Blood Vessel, Lung, and Blood Act of 1972: (1) to carry out basic and clinical research on heart, blood vessel, lung, and blood diseases; (2) to provide demonstrations of advanced methods of prevention, diagnosis, and treatment; and (3) to supply a training source for scientists and physicians concerned with the diseases.

September 16, 1975. Dr. Robert I. Levy is appointed Director of the NHLI, succeeding Dr. Theodore Cooper, who was appointed Deputy Assistant Secretary for Health, HEW, on April 19, 1974.

June 25, 1976. Legislation amending the PHS Act (P.L. 94–278) changes the name of the NHLI to the National Heart, Lung, and Blood Institute (NHLBI) and provides for an expansion in blood-related activities within the Institute and throughout the National Heart, Blood Vessel, Lung, and Blood Program.

August 1, 1977. The Biomedical Research Extension Act of 1977 (P.L. 95–83) reauthorizes the programs of the NHLBI, with continued emphasis on both the national program and related prevention and dissemination activities.

February 1978. The NHLBI and the American Heart Association jointly celebrate their 30th anniversaries.

September 1979. The Task Force on Hypertension, established in September 1975 to assess the state of hypertension research, completes its in-depth survey and recommendations for improved prevention, treatment, and control in 14 major areas. The recommendations are intended to guide the NHLBI in its future efforts.

November 1979. The results of the Hypertension Detection and Follow-Up Program (HDFP), a major clinical trial started in 1971, provide evidence that tens of thousands of lives are being saved through treatment of mild hypertension and that perhaps thousands more could be saved annually if all people with mild hypertension were under treatment.

November 21, 1980. The Albert Lasker Special Public Health Award is presented to the NHLBI for its HDFP, "which stands alone among clinical studies in its profound potential benefit to millions of people."

December 17, 1980. The Health Programs Extension Act of 1980 (P.L. 96–538) reauthorizes the NHLBI, with continued emphasis on both the national program and related prevention programs.

September 8, 1981. The Working Group on Arteriosclerosis, convened in 1978 to assess present

understanding, highlight unresolved problems, and emphasize opportunities for future research in arteriosclerosis, completes its report. Volume I presents conclusions and recommendations in nontechnical language. Volume II provides an in-depth substantive basis for the conclusions and recommendations contained in Volume I.

October 2, 1981. The Beta-Blocker Heart Attack Trial (BHAT) demonstrates benefits to those in the trial who received the drug propranolol compared with the control group.

July 6, 1982. Dr. Claude Lenfant is appointed Director of the NHLBI. He succeeds Dr. Levy.

September 1982. The results of the Multiple Risk Factor Intervention Trial are released. They support measures to reduce cigarette smoking and to lower blood cholesterol to prevent CHD mortality but raise questions about optimal treatment of mild hypertension.

October 26, 1983. The Coronary Artery Surgery Study (CASS) results are released. They demonstrate that mildly symptomatic patients with coronary artery disease can safely defer coronary artery bypass surgery until symptoms worsen.

January 12, 1984. The results of the Lipid Research Clinics Coronary Primary Prevention Trial (LRC-CPPT) are released. They establish conclusively that reducing total blood cholesterol reduces the risk of CHD in men at increased risk because of elevated cholesterol levels. Each 1 percent decrease in cholesterol can be expected to reduce heart attack risk by 2 percent.

April–September 1984. The *Tenth Report of the Director, NHLBI*, commemorates the 10th anniversary of the passage of the National Heart, Blood Vessel, Lung, and Blood Act. The five-volume publication reviews 10 years of research progress and presents a 5-year research plan for the national program.

April 1984. The DECA is created. It provides the Institute with a single focus on clinical trials; prevention, demonstration, and education programs; behavioral medicine; nutrition; epidemiology; and biometry. It also provides new opportunities to examine the interrelationships of cardiovascular, respiratory, and blood diseases.

November 1984. An NHLBI-NIH Clinical Center interagency agreement for studies on the transmission of HIV from humans to chimpanzees leads to the first definitive evidence that the transmission is by blood transfusion.

April 1985. Results of Phase I of the Thrombolysis in Myocardial Infarction (TIMI) trial comparing streptokinase (SK) with recombinant tissue plasminogen activator (t-PA) are published. The new thrombolytic agent recombinant t-PA is approximately twice as effective as SK in opening thrombosed coronary arteries.

October 1985. The NHLBI Smoking Education Program is initiated to increase health care provider awareness about clinical opportunities for smoking cessation programs, techniques for use within health care settings, and resources for use within communities to expand and reinforce such efforts.

October 14, 1985. NHLBI-supported researchers Michael S. Brown and Joseph L. Goldstein are awarded the Nobel Prize in Physiology or Medicine for their discoveries concerning the regulation of cholesterol metabolism.

November 1985. The NHLBI inaugurates the NCEP to increase awareness among health professionals and the public that elevated blood cholesterol is a cause of CHD and that reducing elevated blood cholesterol levels will contribute to the reduction of CHD.

June 1986. Results of the Prophylactic Penicillin Trial demonstrate the efficacy of prophylactic penicillin therapy in reducing the morbidity and mortality associated with pneumococcal infections in children with SCD.

September 18, 1986. The NHLBI sponsors events on the NIH campus in conjunction with the meeting of the X World Congress of Cardiology in Washington, DC. Activities include a special exhibit at the National Library of Medicine entitled "American Contributions to Cardiovascular Medicine and Surgery" and two symposia—"New Dimensions in Cardiovascular Disease Research" and "Cardiovascular Nursing and Nursing Research."

December 17, 1986. The citizens of Framingham, Massachusetts, are presented a tribute by the Assistant Secretary, HHS, for their participation in the Framingham Heart Study over the past 40 years.

September 1987. The NHLBI commemorates the centennial of the NIH and the 40th anniversary of the Institute's inception. Two publications prepared for the Institute's anniversary, *Forty Years of Achievement in*

Heart, Lung, and Blood Research and *A Salute to the Past: A History of the National Heart, Lung, and Blood Institute*, document significant Institute contributions to research and summarize recollections about the Institute's 40-year history.

October 1987. The National Blood Resource Education Program is established to ensure an adequate supply of safe blood and blood components to meet the Nation's needs and to ensure that blood and blood components are transfused only when therapeutically appropriate.

April 1988. The NHLBI initiates its Minority Research Supplements program to provide supplemental funds to ongoing research grants for support of minority investigators added to research teams.

September 1988. AIDS research is added to the National Heart, Blood Vessel, Lung, and Blood Diseases and Blood Resources Program. It is the first area of research to be added since the Program was established in 1973.

September 1988. The NHLBI funds the first of its new Programs of Excellence in Molecular Biology, designed to foster the study of the organization, modification, and expression of the genome in areas of importance to the Institute and to encourage investigators to become skilled in the experimental strategies and techniques of modern molecular biology.

September 1988. The Strong Heart Study is initiated. It focuses on CVD morbidity and mortality rates and distribution of CVD risk factors in three geographically diverse American Indian groups.

October 1988. The National Marrow Donor Program is transferred from the Department of the Navy to the NHLBI. The Program, which serves as a focal point for bone marrow research, includes a national registry of volunteers who have offered to donate marrow for transplant to patients not having suitably matched relatives.

March 1989. The NHLBI initiates a National Asthma Education Program to raise awareness of asthma as a serious chronic disease and to promote more effective management of asthma through patient and professional education.

May 1989. The NHLBI Minority Access to Research Careers (MARC) Summer Research Training Program is initiated to provide an opportunity for MARC Honors Scholars to work with researchers in the NHLBI intramural laboratories.

September 14, 1990. The first human gene therapy protocol in history is undertaken at the NIH. A team of scientists, led by W. French Anderson, NHLBI, and R. Michael Blaese, NCI, insert a normal gene into a patient's cells to compensate for a defective gene that left the patient's cells unable to produce an enzyme essential to the functioning of the body's immune system.

January 1991. The NHLBI OEI begins. Its objective is to make a concerted effort to educate the public and health professionals about obesity as an independent risk factor for CVD and its relationship to other risk factors, such as high blood pressure and high blood cholesterol.

February 1991. The expert panel of the National Asthma Education Program releases its report, *Guidelines for Diagnosis and Management of Asthma*, to educate physicians and other health care providers in asthma management.

April 8–10, 1991. The First National Conference on Cholesterol and Blood Pressure Control is attended by more than 1,800 health professionals.

May 1991. The Task Force on Hypertension, established in November 1989 to assess the state of hypertension research and to develop a plan for future NHLBI funding, presents its conclusions. The report outlines a set of scientific priorities and develops a comprehensive plan for support over the next several years.

June 11, 1991. The NHLBI initiates a NHAAP to reduce premature morbidity and mortality from acute myocardial infarction (AMI) and sudden death. The Program emphasizes rapid disease identification and treatment.

July 1991. Results of the Systolic Hypertension in the Elderly Program (SHEP) demonstrate that low-dose pharmacologic therapy of isolated systolic hypertension in those older than 60 years of age significantly reduces stroke and myocardial infarction.

August 1991. Results of the Studies of Left Ventricular Dysfunction (SOLVD) are released. They demonstrate that use of the angiotensin-converting enzyme (ACE) inhibitor enalapril causes a significant reduction in mortality and hospitalization for congestive heart failure in patients with symptomatic heart failure.

August 1991. The NHLBI sponsors the first national workshop, "Physical Activity and Cardiovascular Health: Special Emphasis on Women and Youth," to assess the current knowledge in the field and to develop scientific priorities and plans for support. Recommendations from the Working Groups are published in the supplemental issue of *Medicine and Science in Sports and Exercise*.

March 1992. The *International Consensus Report on Diagnosis and Management of Asthma* is released. It is to be used by asthma specialists and medical opinion leaders to provide a framework for discussion of asthma management pertinent to their respective countries.

March 1992. Results of the Trials of Hypertension Prevention Phase I are published. They demonstrate that both weight loss and reduction of dietary salt reduce blood pressure in adults with high-normal diastolic blood pressure and may reduce the incidence of primary hypertension.

June 26–27, 1992. The Fourth National Minority Forum on Cardiovascular Health, Pulmonary Disorders, and Blood Resources is attended by nearly 600 individuals.

October 11–13, 1992. The First National Conference on Asthma Management is attended by more than 900 individuals.

October 30, 1992. A celebration of the 20th anniversary of the NHBPEP is held in conjunction with the NHBPEP Coordinating Committee meeting. The *Fifth Report of the Joint National Committee on the Detection, Evaluation, and Treatment of High Blood Pressure* (JNC V) and the *NHBPEP Working Group Report on the Primary Prevention of Hypertension* are released.

June 10, 1993. The NIH Revitalization Act of 1993 (P.L. 103–43) establishes the NCSDR within the NHLBI.

June 15, 1993. The *Second Report of the Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults* (ATP II) is released to the public at a press conference held in conjunction with the NCEP Coordinating Committee meeting.

January 30, 1995. Results of the Multicenter Study of Hydroxyurea (MSH) are released through a clinical alert. They demonstrate that hydroxyurea reduced the number of painful episodes by 50 percent in severely affected adults with SCD. This is the first effective treatment for adult patients with this disorder.

September 1995. The NHLBI funds a new Program of Specialized Centers of Research in Hematopoietic Stem Cell Biology, which is designed to advance our knowledge of stem cell biology and enhance our ability to achieve successful stem cell therapy to cure genetic and acquired diseases.

September 21, 1995. Results of the Bypass Angioplasty Revascularization Investigation are released through a clinical alert. They demonstrate that patients on drug treatment for diabetes who had blockages in two or more coronary arteries and were treated with coronary artery bypass graft (CABG) surgery had, at 5 years, a death rate markedly lower than that of similar patients treated with angioplasty. The clinical alert recommends CABG over standard angioplasty for patients on drug therapy for diabetes who have multiple coronary blockages and are first-time candidates for either procedure.

November 5–6, 1995. The first Conference on Socioeconomic Status (SES) and Cardiovascular Health and Disease is held to determine future opportunities and needs for research on SES factors and their relationships with cardiovascular health and disease.

December 4–5, 1995. A celebration of the 10th anniversary of the NCEP is held in conjunction with the NCEP Coordinating Committee meeting. Results of the 1995 Cholesterol Awareness Surveys of physicians and the public are released.

May 1996. The NHLBI announces results from the Framingham Heart Study that conclude earlier and more aggressive treatment of hypertension is vital to preventing congestive heart failure. The Treatment of Mild Hypertension Study (TOMHS) demonstrates that lifestyle changes, such as weight loss, a healthy eating plan, and physical activity, are crucial for reducing blood lipids in those treated for Stage I hypertension.

September 1996. Findings from the Asthma Clinical Research Network (ACRN) show that for people with asthma, taking an inhaled beta-agonist at regularly scheduled times is safe but provides no greater benefit than taking the medication only when asthma symptoms occur. The recommendation to physicians who treat patients with mild asthma is to prescribe inhaled beta-agonists only on an as-needed basis.

November 13, 1996. The NHLBI releases findings from two studies, Dietary Approaches to Stop Hypertension (DASH) Trial and Trial of Nonpharmacologic

Intervention in the Elderly (TONE). The DASH Trial demonstrates that a diet low in fat and high in vegetables, fruits, fiber, and low-fat dairy products significantly and quickly lowers blood pressure. The TONE shows that weight loss and reduction of dietary sodium safely reduce the need for antihypertensive medication in older patients while keeping their blood pressure under control.

January 1997. Definitive results from the Pathobiological Determinants of Atherosclerosis in Youth (PDAY) program are published. They show that atherosclerosis develops before age 20 and that the risk factors low HDL cholesterol, high LDL cholesterol, and cigarette smoking affect the progression of atherosclerosis equally in women and men, regardless of race.

February 24, 1997. The NAEPP releases the *Expert Panel Report 2, Guidelines for the Diagnosis and Management of Asthma* to the public at a press conference held in conjunction with a meeting of the American Academy of Allergy, Asthma, and Immunology in San Francisco.

May 8, 1997. Results of the Antiarrhythmic Versus Implantable Defibrillator (AVID) clinical trial are presented. They show that an implantable cardiac defibrillator reduces mortality compared to pharmacologic therapy in patients at high risk for sudden cardiac death.

September 1997. The Stroke Prevention Trial in Sickle Cell Anemia (STOP) is terminated early because prophylactic transfusion resulted in a 90 percent relative decrease in the stroke rate among children 2 to 16 years old.

September 1997. The Institute's National Sickle Cell Disease Program celebrates its 25th anniversary.

October 1997. The NHLBI commemorates the 50th anniversary of the Institute's inception. A publication prepared for the Institute's anniversary, *Vital Signs: Discoveries in diseases of the heart, lungs, and blood* documents the remarkable research advances of the past 50 years.

October 1, 1997. The WHI, initiated in 1991, is transferred to the NHLBI.

November 6, 1997. The *Sixth Report of the Joint National Committee on the Prevention, Detection, Evaluation, and Treatment of High Blood Pressure* (JNC VI) is released at a press conference held in conjunction with the 25th anniversary meeting and celebration of the NHBPEP Coordinating Committee.

December 1997. Findings from the Trial To Reduce Alloimmunization to Platelets (TRAP) demonstrate that leucocyte reduction by filtration or ultraviolet B irradiation of platelets—both methods are equally effective—decreases development of lymphocytotoxic antibodies and alloimmune platelet refractoriness.

February 1998. The Task Force on Behavioral Research in Cardiovascular, Lung, and Blood Health and Disease, established in November 1995 to develop a plan for future NHLBI biobehavioral research in cardiovascular, lung, and blood diseases and sleep disorders, presents its recommendations. The report outlines a set of scientific priorities and develops a comprehensive plan for support over the next several years.

February 19–21, 1998. The NHLBI and cosponsors—California CVD Prevention Coalition; California Department of Health Services; CVD Outreach, Resources, and Epidemiology Program; and the University of California, San Francisco—hold Cardiovascular Health: Coming Together for the 21st Century, A National Conference, in San Francisco.

March 16, 1998. A special symposium is held at the annual meeting of the American Academy of Asthma, Allergy, and Immunology to celebrate 50 years of NHLBI-supported science.

June 17, 1998. The NHLBI, in cooperation with the NIDDK, releases *Clinical Guidelines on the Identification, Treatment, and Evaluation of Overweight and Obesity in Adults: Evidence Report*.

December 11, 1998. World Asthma Day is established on this date. The NAEPP launches the Asthma Management Model System, an innovative Web-based information management tool.

March 1999. The ARDS Network Study of Ventilator Management in ARDS is stopped early so that critical care specialists can be alerted to the results. The study demonstrated that approximately 25 percent fewer deaths occurred among intensive care patients with ARDS receiving small, rather than large, breaths of air from a mechanical ventilator.

March 22, 1999. The NAEPP holds its 10th anniversary meeting and celebration to recognize a decade of progress and a continued commitment to the future.

August 1999. Results of the Early Revascularization for Cardiogenic Shock are released. They show improved survival at 6 months in patients treated with balloon angioplasty or coronary bypass surgery compared with patients who receive intensive medical care to stabilize their condition.

September 27–29, 1999. The NHLBI sponsors the National Conference on Cardiovascular Disease Prevention: Meeting the Healthy People 2010 Objectives for Cardiovascular Health.

November 2, 1999. The NAEPP convenes a Workshop on Strengthening Asthma Coalitions: Thinking Globally, Acting Locally to gather information from coalition representatives on ways the NAEPP could support their efforts.

November 2–3, 1999. The NHLBI sponsors a Workshop on Research Training and Career Development.

March 8, 2000. A part of the Antihypertensive and Lipid-Lowering Treatment To Prevent Heart Attack Trial (ALLHAT) is terminated early because one of the tested drugs, an alpha-adrenergic blocker, was found to be less effective than the more traditional diuretic in reducing some forms of CVD.

March 29, 2000. The NHLBI launches the Web-based Healthy People 2010 Gateway to provide information and resources on cardiovascular health, asthma, sleep, and minority populations.

April 25, 2000. The NHLBI sponsors a special expert meeting, Scientific Frontiers in Cardiothoracic Surgery, to discuss the future of cardiothoracic research.

September 2000. NHLBI-supported investigators identify a gene for primary pulmonary hypertension.

October 2000. Results from the Childhood Asthma Management Program (CAMP) demonstrate that inhaled corticosteroids are safe and effective for long-term treatment of children with mild-to-moderate asthma.

January 2001. Results of the DASH-Sodium Trial are released. They show that dietary sodium reduction substantially lowers blood pressure in persons with high blood pressure; the greatest effect occurs when sodium reduction is combined with the DASH diet.

February 2001. The NHLBI launches a sleep education program for children, using star sleeper Garfield the Cat.

February 1, 2001. The NHLBI, along with the HHS Office of Disease Prevention and Health Promotion, the Office of the Surgeon General, the Centers for Disease Control and Prevention (CDC), the NINDS, and the American Heart Association, signs a memorandum of understanding to focus and coordinate their efforts to meet the Healthy People 2010 objectives on cardiovascular health.

March 26–27, 2001. A strategy development workshop, "Women's Heart Health: Developing a National Health Education Action Plan," is held to develop an agenda for the NHLBI's new heart health education effort directed at women.

April 2001. The NHLBI releases the international guidelines for diagnosis, management, and prevention of COPD.

April 2001. NHLBI-supported investigators identify genes that regulate human cholesterol levels.

May 2001. The NHLBI releases the NCEP's *Third Report of the Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults* (ATP III).

June 2001. NHLBI-supported investigators find that human heart muscle cells regenerate after a heart attack.

July 2001. A self-contained artificial heart is implanted in a patient for the first time.

August 2001. Early results from the National Emphysema Treatment Trial (NETT) identify characteristics of patients at high risk for death following lung volume reduction surgery.

August 2001. Scientists from the NHLBI SCOR program at Yale University identify two genes responsible for pseudohypoaldosteronism type II, a rare Mendelian form of high blood pressure. These genes encode for protein kinases involved in a previously unknown pathway and may provide new targets for therapy.

September 10, 2001. The NHLBI, along with the American Heart Association and other partners, launches a national campaign, "Act in Time to Heart Attack Signs," to increase awareness of the signs of heart attack and the need for a fast response.

October 2001. NHLBI-supported scientists report that the drug, infliximab, increases risk of TB reactivation and dissemination. The drug is used to treat refractory rheumatoid arthritis and Crohn's disease and is proposed as a treatment for several chronic lung diseases.

November 2001. Results of the Randomized Evaluation of Mechanical Assistance for the Treatment of Chronic Heart Failure Trial demonstrate that using an implanted left ventricular assist device can prolong survival and improve quality of life in severely ill patients who are not candidates for heart transplantation.

December 2001. For the first time, scientists correct SCD in mice using gene therapy.

April 10, 2002. The World Hypertension League (WHL) and the NHLBI hold an international symposium; subsequently they prepare an action plan at the WHL Council Conference to control hypertension and obesity.

April 11–13, 2002. The NHLBI and cosponsors—the HHS Office of Disease Prevention and Health Promotion, the CDC, the American Heart Association, the Centers for Medicare & Medicaid Services, and the Health Resources and Services Administration—hold a national conference, "Cardiovascular Health for All: Meeting the Challenge of Healthy People 2010."

June 2002. The NAEPP issues an update of selected topics in the *Guidelines for the Diagnosis and Management of Asthma*.

June 2002. The fourth edition of *The Management of Sickle Cell Disease*, which describes the current approach to counseling SCD patients and managing many of the medical complications of SCD, is issued to coincide with the 30th anniversary of the NHLBI Sickle Cell Program.

July 9, 2002. The NHLBI stops early the trial of the estrogen plus progestin component of the WHI due to increased breast cancer risk and lack of overall benefits. The multicenter trial also found increases in CHD, stroke, and pulmonary embolism in participants on estrogen plus progestin compared to women taking placebo pills.

August 2002. NHLBI-supported scientists identify a gene variant that is associated with arrhythmia in blacks.

December 4, 2002. Results of the Atrial Fibrillation Follow-Up Investigation of Rhythm Management Trial (AFFIRM) indicate that rate control rather than rhythm control may be the preferred approach for patients with atrial fibrillation. The rate control strategy involves the use of less expensive drugs and results in fewer hospitalizations.

December 17, 2002. Results of the ALLHAT, the largest hypertension clinical trial ever conducted, show that less expensive traditional diuretics are at least as good as newer medicines (calcium channel blocker and ACE inhibitors) in treating high blood pressure and preventing some forms of heart disease.

January 23, 2002. An NHLBI-supported study demonstrates that magnetic resonance imaging can be used to detect heart attacks faster and more accurately than traditional methods in patients who arrive at the emergency room with chest pain.

February 24, 2002. The Prevention of Recurrent Venous Thromboembolism Trial is stopped early because treatment with low-dose warfarin to prevent recurrence of deep vein thrombosis and pulmonary embolism was so beneficial.

April 2003. Results of the MSH Patients' Follow-Up Study show that the adult patients who took hydroxyurea over a 9-year period experienced a 40 percent reduction in deaths. Survival was related to fetal hemoglobin levels and frequency of vaso-occlusive events.

April 23, 2003. Results of the PREMIER trial of behavioral lifestyle interventions for blood pressure control show that individuals with prehypertension or stage 1 hypertension can lower their blood pressure by making multiple lifestyle changes.

May 14, 2003. The *Seventh Report of the Joint National Committee on the Prevention, Detection, Evaluation, and Treatment of High Blood Pressure* (JNC VII) is released.

May 22, 2003. The NETT finds that lung volume reduction surgery (LVRS) benefits emphysema patients with certain clinical characteristics. The findings will be useful in the determination of Medicare coverage policy.

July 2003. The NHLBI and Gen-Probe Corporation succeed in developing a test to screen donated blood for the West Nile Virus.

August 2003. The NHLBI establishes a partnership with the CIHR to advance research on cardiovascular, respiratory, and blood diseases.

November 2003. The Public Access Defibrillation Trial demonstrates that use of an automated external defibrillator and CPR by trained community volunteers can increase survival for victims of sudden cardiac arrest.

March 2004. The NIH stops the estrogen-alone component of the WHI early due to the increased risk of stroke and deep vein thrombosis. Estrogen does not appear to affect heart disease.

March 2004. Preliminary results of the Sudden Cardiac Death in Heart Failure Trial demonstrate that an implantable cardiac defibrillator can reduce death in heart failure patients.

July 2004. The NHLBI releases an update to the 2001 NCEP ATP III guidelines on the treatment of high blood cholesterol in adults.

August 2004. The NHBPEP Working Group on High Blood Pressure in Children and Adolescents releases the *Fourth Report on the Diagnosis, Evaluation, and Treatment of High Blood Pressure in Children and Adolescents*.

August 2004. An NHLBI-funded study shows that nucleic acid amplification testing for HIV-1 and hepatitis C virus further safeguards the Nation's blood supply.

October 2004. Results from a new study of adults with mild asthma by researchers participating in the ACRN demonstrate that genes affect patient response, over time, to daily doses of inhaled albuterol, a drug used for relief of acute asthma symptoms. A few weeks of its regular use improves overall asthma control in individuals with one form of the gene, but stopping all use of albuterol eventually improves asthma control in those with another form of the gene. The findings could lead to better ways to individualize asthma therapy.

November 2004. Results of the Prevention of Events With Angiotensin Converting Enzyme Inhibition (PEACE) demonstrate that many heart disease patients who are already receiving state-of-the art therapy do not gain extra cardiovascular protection from ACE inhibitors.

December 2004. The NHLBI stops early the Stroke Prevention in Sickle Cell Anemia Trial II (STOP II) so that physicians who treat children with sickle cell anemia can be alerted to its findings. STOP II, which is a study to determine whether children with sickle cell anemia and at high risk for stroke could at some point safely stop receiving the periodic blood transfusions that prevent strokes, shows that children revert to high risk for stroke when transfusions are stopped.

January 2005. The NHLBI issues new guidelines for managing asthma during pregnancy.

January 26, 2005. Dr. Elizabeth G. Nabel is appointed Director of the NHLBI. She succeeds Dr. Claude Lenfant.

February 2005. NHLBI-supported scientists identify two genetic mutations common in individuals of African descent that are associated with a 40 percent reduction in LDL cholesterol.

February 15, 2006. Results from the WHI Calcium and Vitamin D Trial show that calcium and vitamin D supplements in healthy postmenopausal women provide a modest improvement in bone mass preservation and prevent hip fractures in certain groups, including older women, but do not prevent other types of fractures or colorectal cancer.

May 10, 2006. Results from the Childhood Asthma Research and Education (CARE) Network show that daily treatment with inhaled corticosteroids can reduce breathing problems in preschool-aged children at high risk for asthma, but does not prevent them from developing persistent asthma.

May 31, 2006. The Prospective Investigation of Pulmonary Embolism Diagnosis (PIOPED) II finds that the ability to diagnose pulmonary embolism is improved when a commonly used imaging test of the chest to detect potentially deadly blood clots in the lung is complemented by an extension of the scan to the legs—where the clots typically originate—or by a standard clinical assessment.

June 6, 2006. Results for the Should We Emergently Revascularize Occluded Coronaries for Cardiogenic Shock (SHOCK) trial show that treating heart attack patients who have a life-threatening complication called cardiogenic shock with emergency angioplasty or bypass surgery greatly improves their long-term survival.

July 18, 2006. NHLBI scientists find that a hormone called brain natriuretic peptide or BNP, which can be detected in a simple blood test, can identify patients with

SCD who have developed a life-threatening complication called pulmonary hypertension. The hormone is also a predictor of death in adult sickle cell patients.

July 26, 2006. Results from two randomized clinical trials demonstrate that inhaled nitric oxide administered within the first few weeks of life helps prevent chronic lung disease in some low birthweight premature infants. Moreover, when administered within 48 hours after birth, it appears to protect some premature newborns from brain injury.

September 19, 2006. The NHLBI launches a peripheral artery disease awareness and education campaign, "Stay in Circulation: Take Steps To Learn About P.A.D."

4. Disease Statistics

Cardiovascular, lung, and blood diseases constitute a large morbidity, mortality, and economic burden on individuals, families, and the Nation. Common forms are atherosclerosis, hypertension, COPD, and blood-clotting disorders—embolisms and thromboses. The most serious atherosclerotic diseases are CHD, as manifested by heart attack and angina pectoris, and cerebrovascular disease, as manifested by stroke.

In 2004, cardiovascular, lung, and blood diseases accounted for 1,099,000 deaths and 46 percent of all deaths in the United States (p. 35). The projected economic cost in 2007 for these diseases is expected to be $599 billion, 23 percent of the total economic costs of illness, injuries, and death (p. 51). Of all diseases, heart disease is the leading cause of death, cerebrovascular disease is third (behind cancer), and COPD (including asthma) ranks fourth (p. 38). Cardiovascular and lung diseases account for 3 of the 4 leading causes of death (p. 38) and 5 of the 10 leading causes of infant death (p. 44). Hypertension, heart disease, asthma, and COPD are especially prevalent and account for substantial morbidity in Americans (p. 47).

The purpose of the biomedical research conducted by the NHLBI is to contribute to the prevention and treatment of cardiovascular, lung, and blood diseases and sleep disorders. National disease statistics show that by midcentury, morbidity and mortality from these diseases had reached record high levels. Since then, however, substantial improvements have been achieved, especially over the past 40 years, as shown by the significant decline in mortality rates. Because many of these diseases begin early in life, their early detection and control can reduce the risk of disability and can delay death. Although important advances have been made in the treatment and control of cardiovascular, lung, and blood diseases, these diseases continue to be a major burden on the Nation.

Cardiovascular Diseases

- In 2004, CVD caused 872,000 deaths—36 percent of all deaths (p. 35).
- Heart disease is the leading cause of death; the main form, CHD, caused 452,000 deaths in 2004 (pp. 36, 38).
- The annual number of deaths from CVD increased substantially between 1900 and 1970 and remains high (p. 37).
- The death rate (not age-adjusted) for CVD increased from 1920 until it peaked in 1968. Since then, the trend has been downward. In 2004, the rate was similar to the rate in the 1920s (p. 37).
- Cerebrovascular disease, the third leading cause of death, accounted for 150,000 deaths in 2004 (pp. 36, 38).
- Heart disease is second only to all cancers combined in years of potential life lost (p. 38).
- Heart disease is the leading cause of death in blacks, Hispanics, and American Indians, but second to cancer in Asians. Stroke ranks as the third or fourth leading cause of death in the minority groups, except in American Indians, where it ranks sixth (p. 38).
- The rapid increase in deaths due to heart failure between 1970 and 2004 is a major exception to the mortality decline in CVD (p. 39).
- Between 1985 and 2003, death rates for heart disease and stroke declined in men and women of all racial/ethnic groups. Declines in death rates for heart disease were greatest in whites and for stroke, were greatest in blacks (p. 40).
- Because of the rapid decline in mortality from CHD since the peak in 1968, there were 995,000 fewer deaths from CHD in 2004 than would have occurred if there had been no decline (p. 41).

- Substantial improvements have been made in the treatment of CVD. Since 1975 or 1985, case-fatality rates from hospitalized AMI, stroke, heart failure, and cardiac dysrhythmia declined appreciably (p. 41).
- The decline in CHD mortality began earlier in the United States than in most countries and outpaced that in most countries (only selected countries are shown) (p. 42).
- Between 1999 and 2004, the percent decline in death rates for CHD and stroke was slightly greater for whites than for blacks (p. 43).
- In 2004, an estimated 79.4 million persons in the United States had some form of CVD, 72 million had hypertension, and 15.8 million had CHD (p. 47).
- Since the 1960s, there has been a substantial reduction in the prevalence of CVD risk factors: hypertension, smoking, and high cholesterol, but not overweight. The decline in prevalence of hypertension from 1976–80 to 1988–94 was followed by an increase in 1994–2004 (p. 48).
- Between 1976–80 and 1999–2004, the percent of persons with hypertension who were aware of their condition, on treatment for it, and having their blood pressure under control increased substantially (p. 49).
- A 1999–2004 national survey showed only about 40 percent of hypertensive patients (systolic BP $\geq$ 140 mm Hg or diastolic BP $\geq$ 90 mm Hg or on antihypertensive medication) had their condition under control (p. 49).
- Hospitalization rates for heart failure increased between 1971 and 2004 (p. 50).
- The estimated economic cost of CVD for 2007 is approximately $432 billion:
  - $283 billion in direct health expenditures
  - $36 billion in indirect cost of morbidity
  - $112 billion in indirect cost of mortality (p. 51).

Lung Diseases

- Lung diseases, excluding lung cancer, caused an estimated 231,000 deaths in 2004 (p. 35).
- COPD caused 120,000 deaths in 2004 and is the fourth leading cause of death (pp. 36, 38).
- Between 1999 and 2004, death rates for COPD and asthma decreased in both black and white men and women, with one exception: the COPD death rate increased slightly in white women (p. 43).
- Between 1980 and 2004, infant death rates for various lung diseases declined markedly (p. 42).
- Of the 10 leading causes of infant mortality, 4 are lung diseases or have a lung disease component (p. 44). Between 1994 and 2004, changes in mortality for the causes were:
  - Congenital anomalies (-15 percent)
  - Disorders of short gestation (-5 percent)
  - Sudden infant death syndrome (-50 percent)
  - Respiratory distress syndrome (-42 percent).
- One in 5 deaths in children under 1 year of age is due to a lung disease (p. 44).
- The COPD death rate for women in the United States is increasing significantly compared with the rates in several other countries (p. 45).
- Between 1985 and 2003, death rates for COPD increased for women in all racial/ethnic groups except Asian. For men, they increased in American Indians, decreased in whites and Asians, and were essentially flat in blacks and Hispanics (p. 46).
- Sleep disorders are increasingly being recognized as an important health problem. The number of physician office visits for sleep apnea, restless legs syndrome, and narcolepsy increased from 1,046,927 in 1990 to 6,549,402 in 2004 (p. 46).
- Asthma is a common chronic condition, particularly in children (pp. 47, 48, 50).
- The economic cost of lung diseases is expected to be $154 billion in 2007—$95 billion in direct health expenditures and $59 billion in indirect cost of morbidity and mortality (p. 51).

Blood Diseases

- An estimated 232,000 deaths, 10 percent of all deaths, were attributed to blood diseases in 2004 (p. 35). These include the following:
  - 222,000 due to blood-clotting disorders
  - 10,000 to diseases of the red blood cell and bleeding disorders (p. 36).
- A large proportion of deaths from AMI and cerebrovascular disease involve blood-clotting problems (p. 36).
- In 2007, blood-clotting disorders are expected to cost the Nation's economy $100 billion, and other blood diseases will cost $14 billion (p. 51).
- The mean age at death for persons with sickle cell anemia increased from about 28 years in 1979 to 37.4 years in 2003 (not shown).

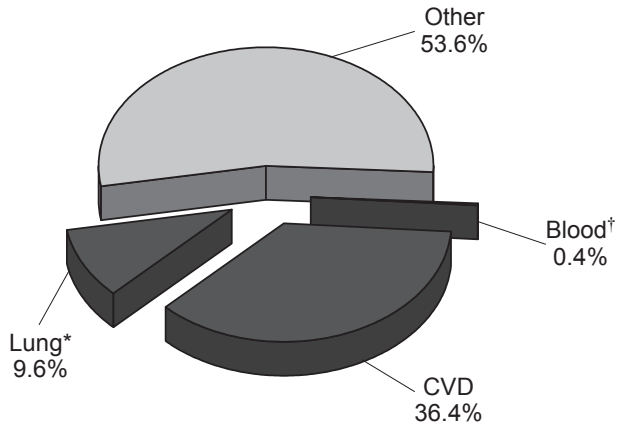
Deaths From All Causes and Deaths From Cardiovascular, Lung, and Blood Diseases, U.S., 1984 and 2004

Cause of Death	1984 Number of Deaths	1984 Percent of Total	2004 Number of Deaths	2004 Percent of Total
All Causes	2,039,000	100	2,398,000	100
All Cardiovascular, Lung, and Blood Diseases	1,149,000	56	1,099,000	46
Cardiovascular Diseases	984,000	48	872,000	36
Blood	319,000*	16	232,000**	10
Lung	169,000†	8	231,000‡	10
All Other Causes	890,000	44	1,299,000	54

* Includes 311,000 CVD deaths involving blood-clotting diseases.
** Includes 222,000 CVD deaths involving blood-clotting diseases.
† Includes 12,000 CVD deaths due to pulmonary heart disease.
‡ Includes 14,000 CVD deaths due to pulmonary heart disease.

Source: Vital Statistics of the United States, National Center for Health Statistics (NCHS).

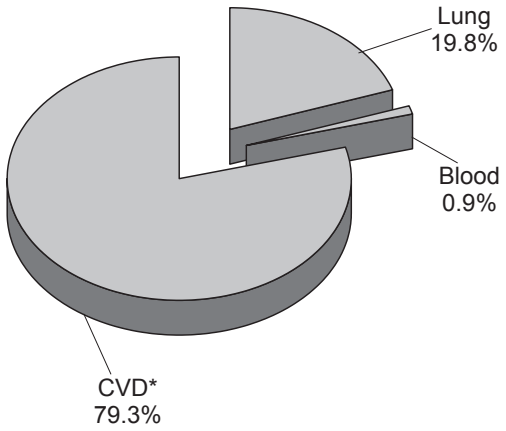
Deaths by Major Causes, U.S., 2004



Total Cardiovascular, Lung, and Blood Diseases 46.4%

* Excludes deaths from pulmonary heart disease (14,000).
† Excludes deaths from blood-clotting disorders (222,000).

Deaths From Cardiovascular, Lung, and Blood Diseases, U.S., 2004



* CVD involving blood clotting (20.2%).

Deaths From Specific Cardiovascular, Lung, and Blood Diseases, U.S., 2004

Cause of Death	Deaths (Thousands)		
	Cardiovascular	Lung	Blood
Acute Myocardial Infarction	158	—	107*
Other Coronary Heart Disease	295	—	—
Heart Failure	58	—	—
Cerebrovascular Diseases (Stroke)	150	—	102*
Other Atherosclerosis	36	—	4*
Pulmonary Embolism	9	9*	9*
Other Cardiovascular Diseases	166	5*	—
Bleeding and Red Blood Cell Diseases	—	—	10
Chronic Obstructive Pulmonary Disease†	—	120	—
Asthma	—	4	—
Other Airway Diseases	—	0	—
Pneumonia	—	61	—
Neonatal Pulmonary Disorders	—	5	—
Interstitial Lung Diseases	—	5	—
Lung Diseases Due to External Agents	—	18	—
Other Lung Diseases	—	4	—
Total	**872**	**231**	**232**

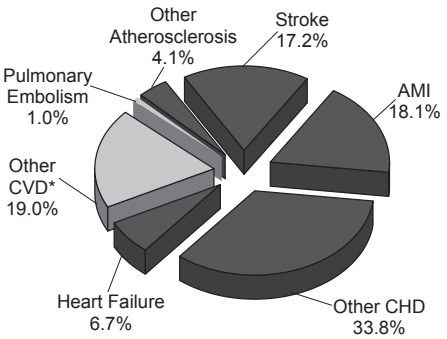
* Deaths from clotting or pulmonary disorders also are included as cardiovascular deaths.

† This term is preferred to the equivalent term "chronic lower respiratory diseases" given in the 10th revision of the International Classification of Diseases (ICD).

Note: Total, excluding overlap, is 1,099,000.

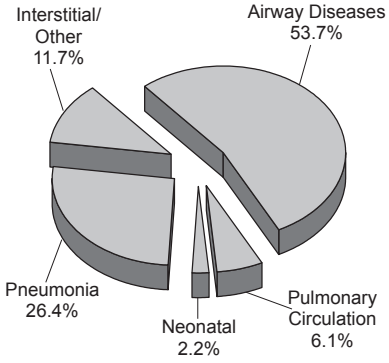
Source: Estimated by the NHLBI from Vital Statistics of the United States, NCHS.

Deaths From Cardiovascular Diseases, U.S., 2004

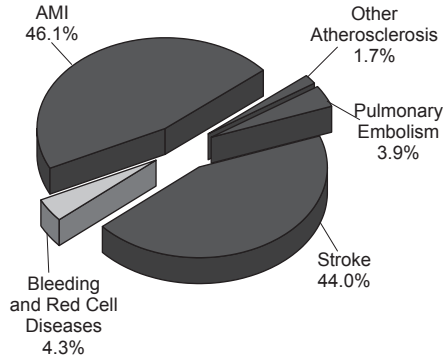


* Includes cardiac dysrhythmias, hypertensive disease, and other heart and blood vessel diseases.

Deaths From Lung Diseases, U.S., 2004

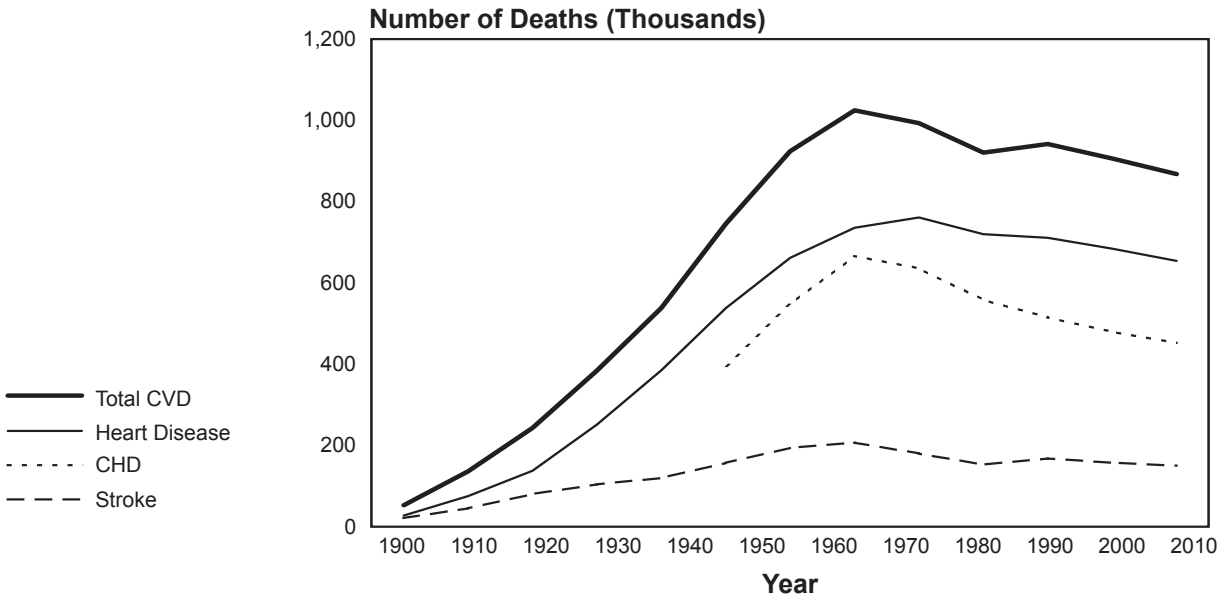


Deaths From Blood Diseases, U.S., 2004



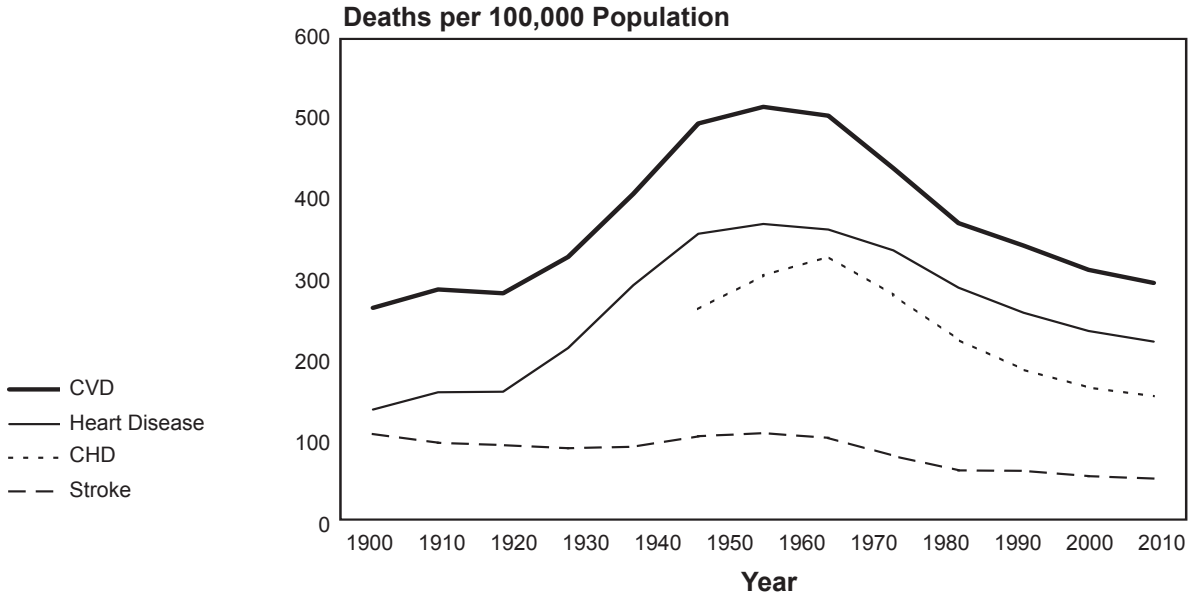
Source: Estimated by the NHLBI from Vital Statisics of the United States, NCHS.

Deaths From Cardiovascular Diseases, U.S., 1900–2004



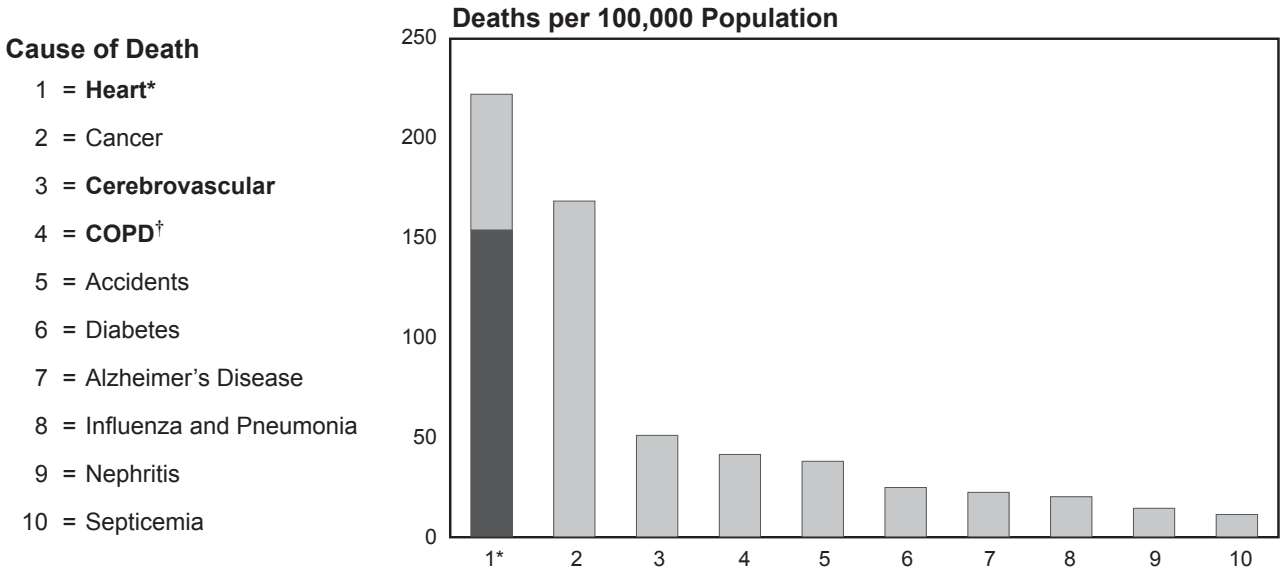
Source: Vital Statistics of the United States, NCHS.

Death Rates* for Cardiovascular Diseases, U.S., 1900–2004



* Not age-adjusted.
Source: Vital Statistics of the United States, NCHS.

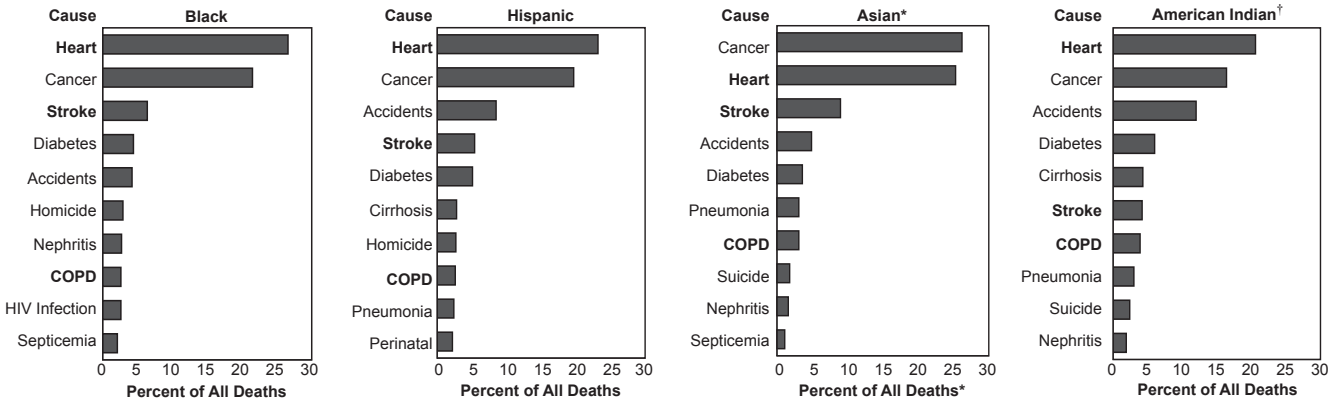
Ten Leading Causes of Death: Death Rates, U.S., 2004



Years of potential life lost (millions)‡	3.5	4.8	0.6	0.6	3.0	0.6	0.2	< 0.1	0.2	0.2

* Includes 154.0 deaths per 100,000 population from CHD.
† COPD and allied conditions (including asthma); the term in the ICD/10 is "chronic lower respiratory diseases."
‡ Based on the average remaining years of life up to age 77 years.
Note: Bolded diseases are those addressed in Institute programs.
Source: Vital Statistics of the United States, NCHS.

Ten Leading Causes of Death Among Minority Groups, U.S., 2003



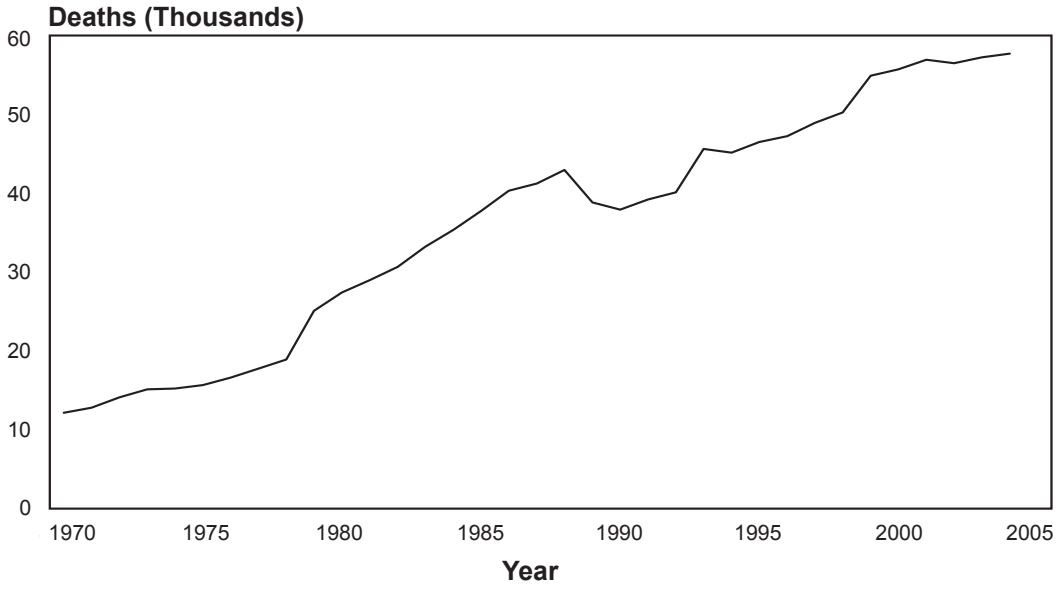
* Includes deaths among individuals of Asian extraction and Asian-Pacific Islanders.
† Includes deaths among Aleuts and Eskimos.
Note: Bolded causes of death are those addressed in Institute programs.
Source: Vital Statistics of the United States, NCHS.

Death Rates* for Cardiovascular and Noncardiovascular Diseases, U.S., 1963, 1984, and 2004

Cause of Death	Rate* 1963	1984	2004	Percent Change 1963–2004	Percent Change 1984–2004
All Causes	1,346	982	801	-40	-18
Cardiovascular Diseases	805	488	289	-64	-41
Coronary Heart Disease	478	268	150	-69	-44
Stroke	174	83†	50	-71	-40
Other	153	137	88	-42	-36
Noncardiovascular Diseases	541	495	512	-5	4
COPD and Asthma	16	34‡	42	153	24
Other	524	462	471	-10	2

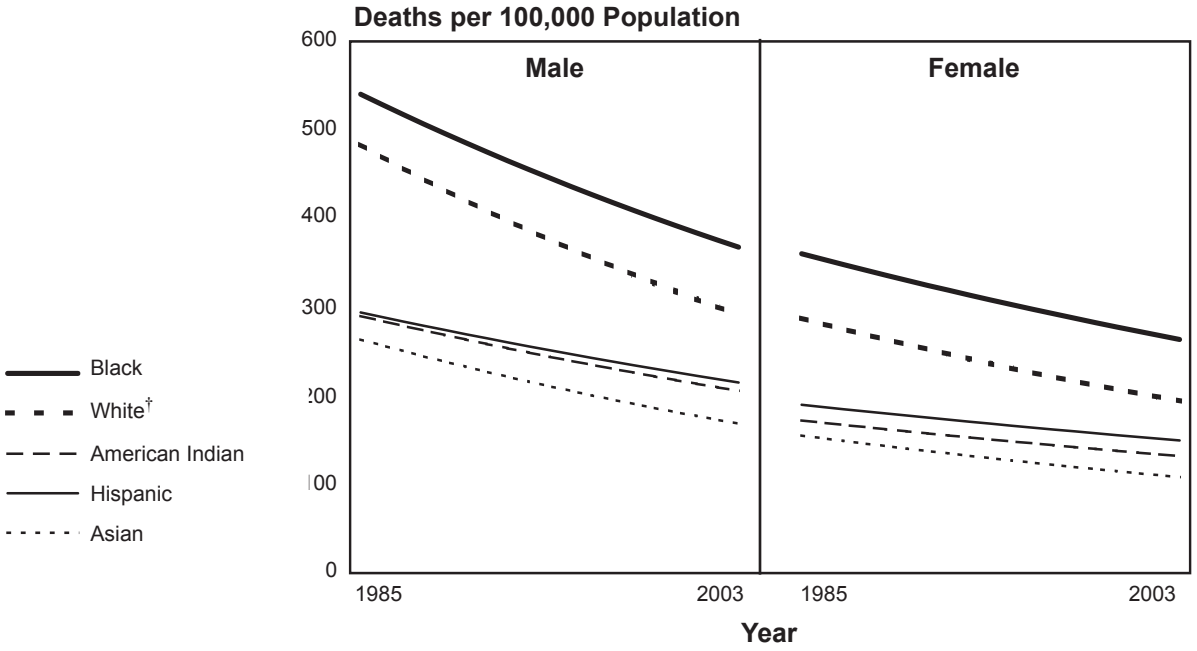
* Age-adjusted; rate per 100,000 population.
† Comparability ratio (1.0502) applied.
‡ Comparability ratio (1.0411) applied.
Source: Vital Statistics of the United States, NCHS.

Deaths From Heart Failure, U.S., 1970–2004



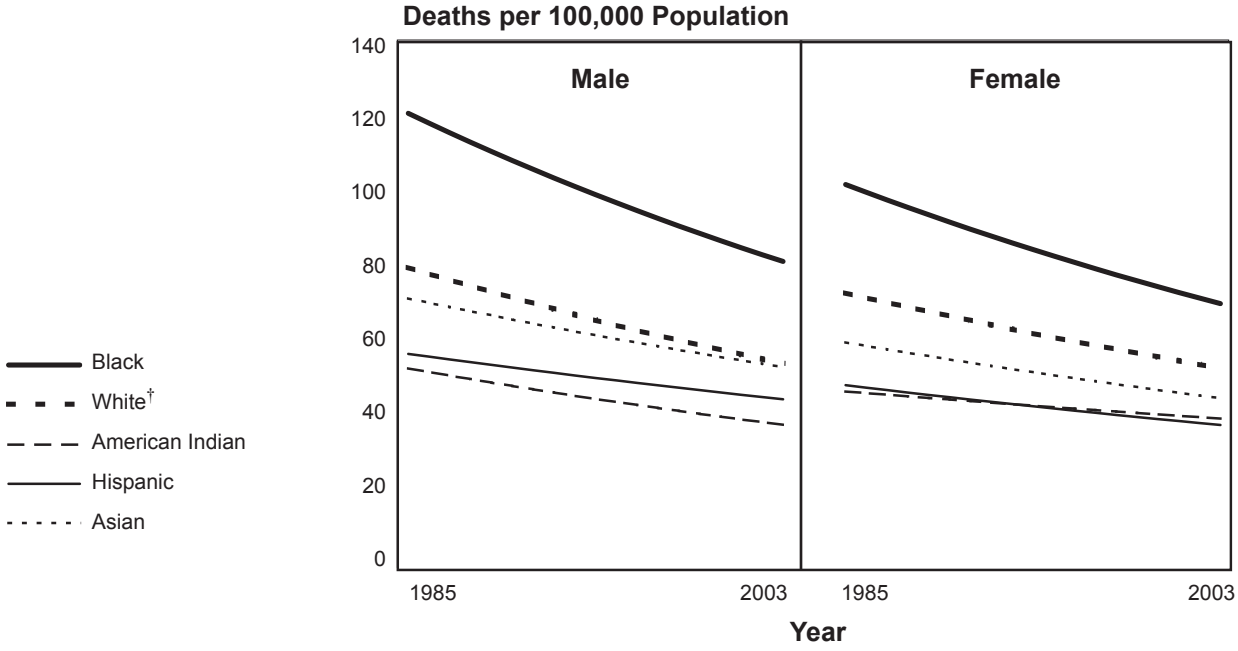
Note: The sharp drop occurring in 1989 is attributed to the revision of the death certificate.
Source: Vital Statistics of the United States, NCHS.

Death Rates* for Heart Disease by Gender, Race, and Ethnicity, U.S., 1985–2003



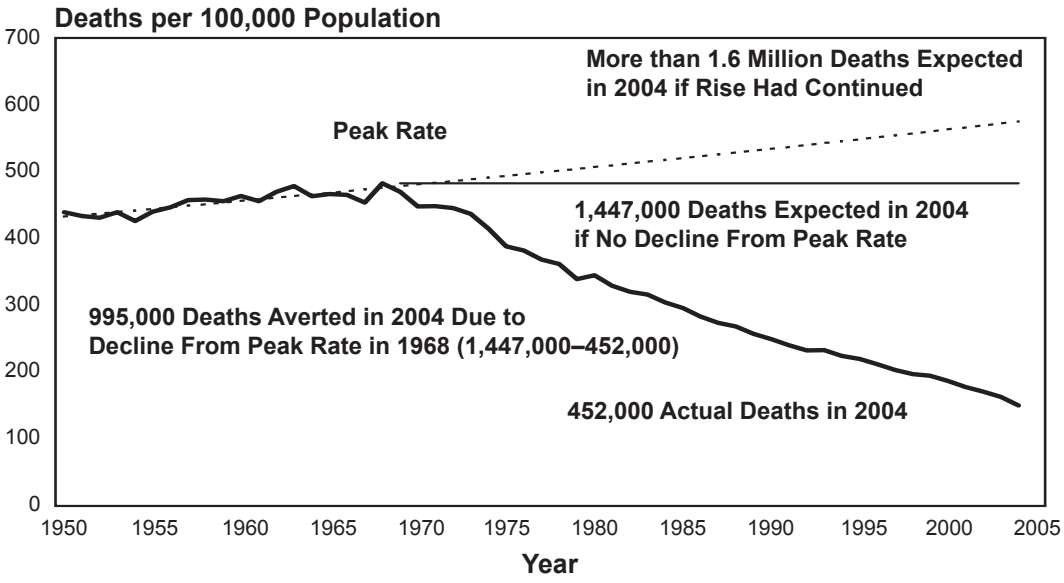
* Age-adjusted.
† Non-Hispanic.
Note: Each line is a log linear regression derived from the actual rates.
Source: Vital Statistics of the United States, NCHS.

Death Rates* for Stroke by Gender, Race, and Ethnicity, U.S., 1985–2003



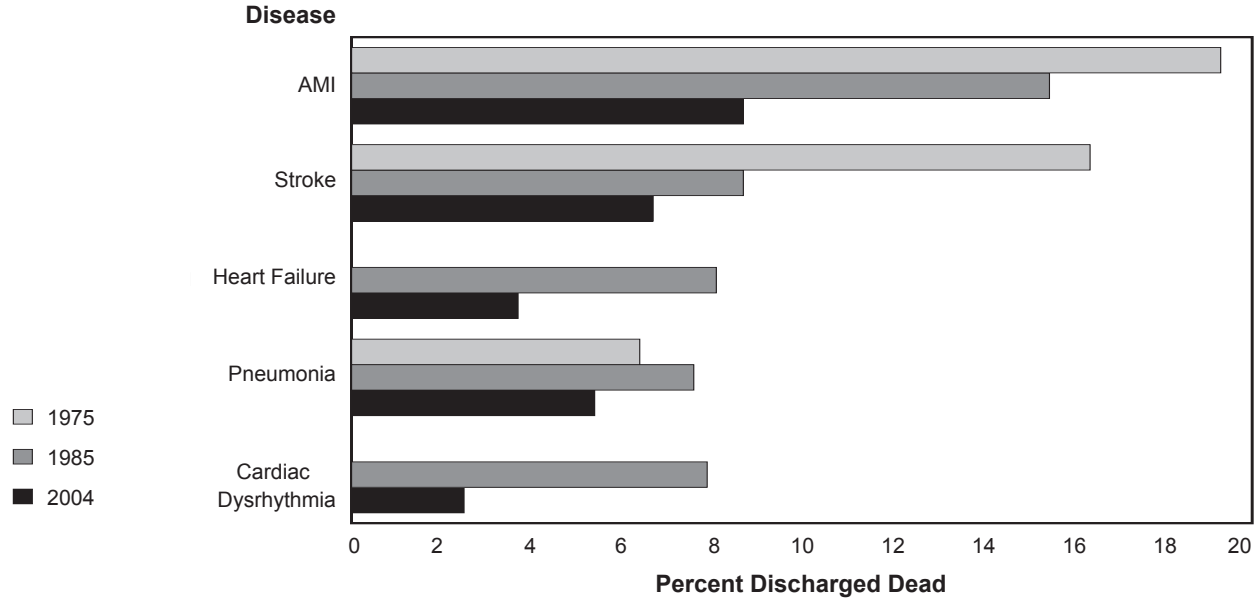
* Age-adjusted.
† Non-Hispanic.
Note: Each line is a log linear regression derived from the actual rates.
Source: Vital Statistics of the United States, NCHS.

Death Rates* for Coronary Heart Disease, U.S., 1950–2004
Actual Rate and Expected Rates if Rise Had Continued or Reached a Plateau



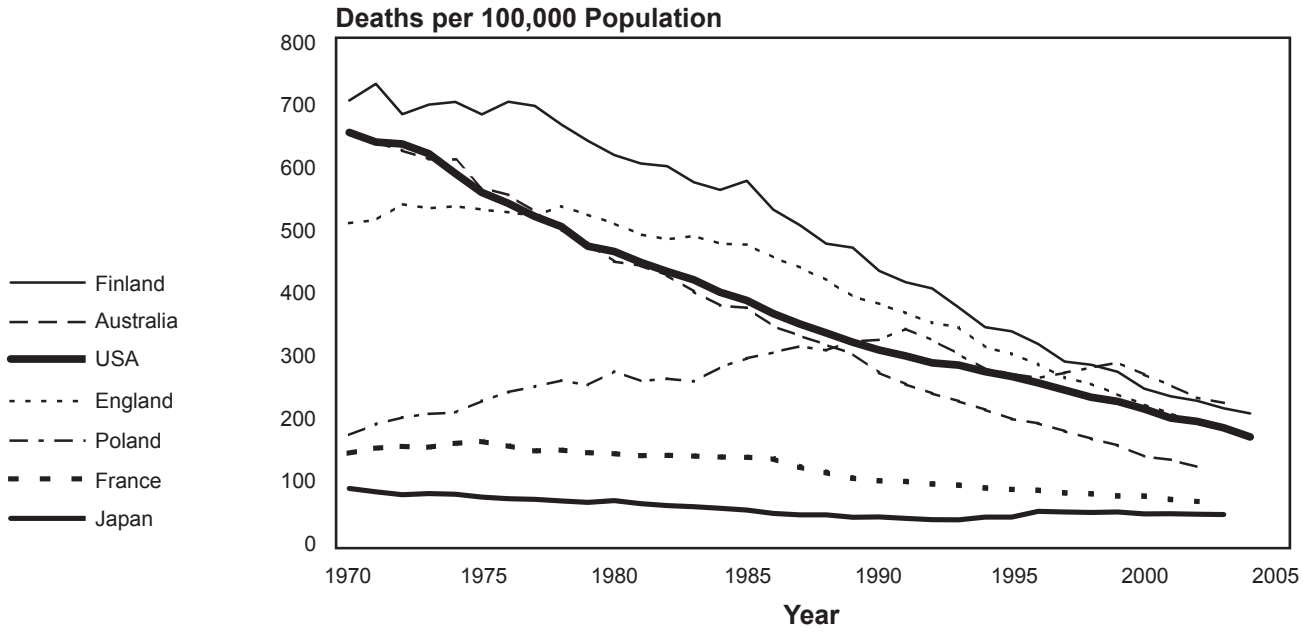
* Age-adjusted.
Source: Vital Statistics of the United States, NCHS.

Common Cardiovascular and Lung Diseases With High Percentage Discharged Dead From Hospitals, U.S., 1975, 1985, and 2004



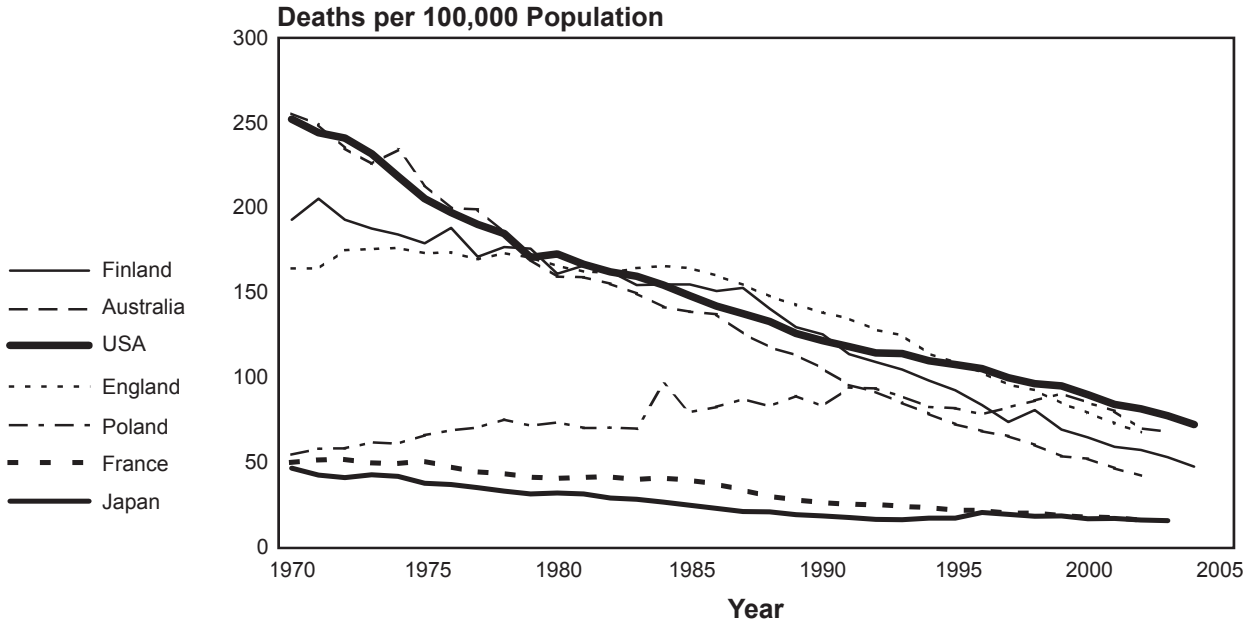
Source: National Hospital Discharge Survey, NCHS.

Death Rates* for Coronary Heart Disease in Men Ages 35–74 Years, Selected Countries, 1970–2004



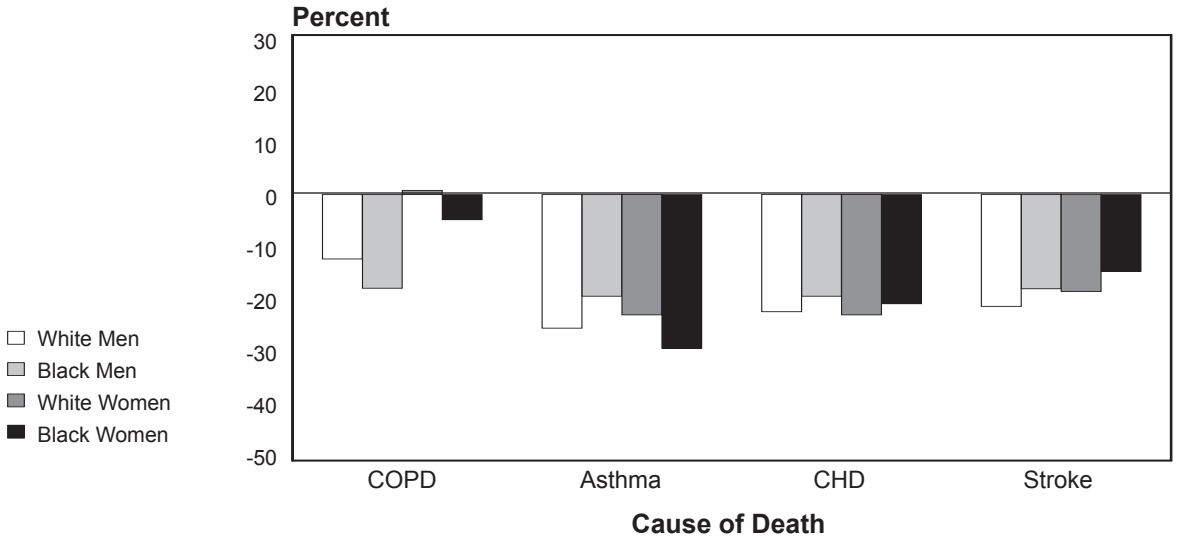
* Age-adjusted to the European Standard Population.
Source: World Health Organization.

Death Rates* for Coronary Heart Disease in Women Ages 35–74 Years, Selected Countries, 1970–2004



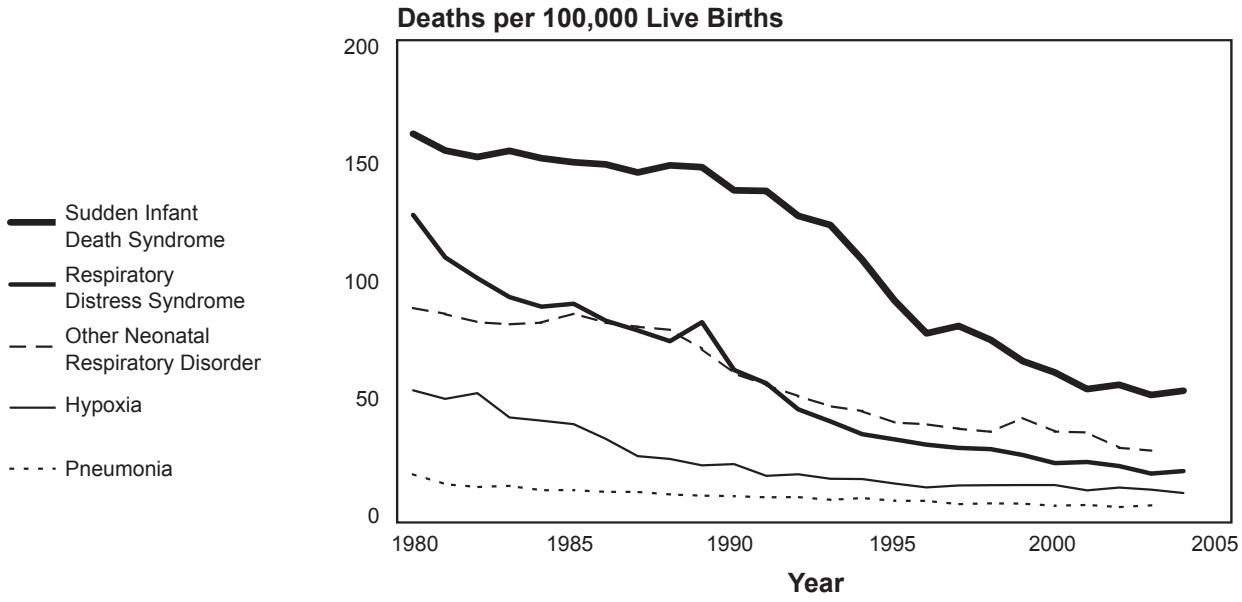
* Age-adjusted to the European Standard Population.
Source: World Health Organization.

Change in Death Rates* for Selected Causes by Race and Gender, U.S., 1999–2004



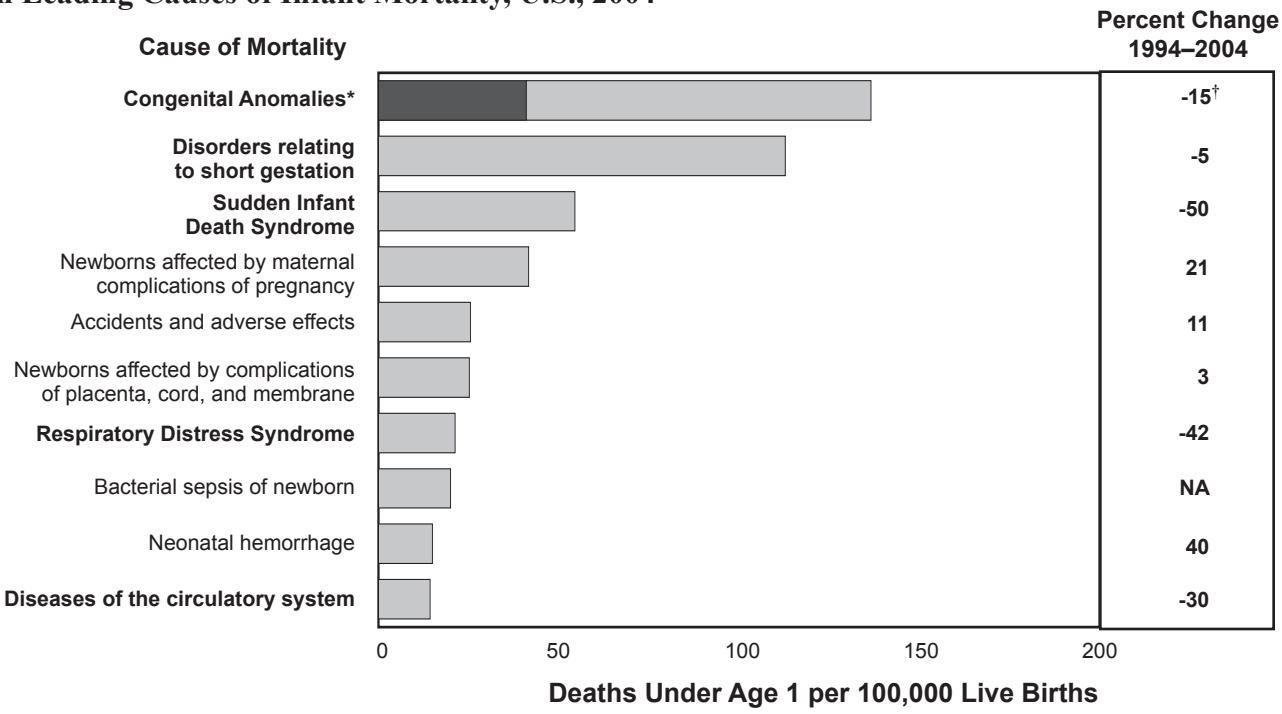
* Age-adjusted.
Source: Vital Statistics of the United States, NCHS.

Death Rates for Lung Diseases in Infants, U.S., 1980–2004



Source: Vital Statistics of the United States, NCHS.

Ten Leading Causes of Infant Mortality, U.S., 2004

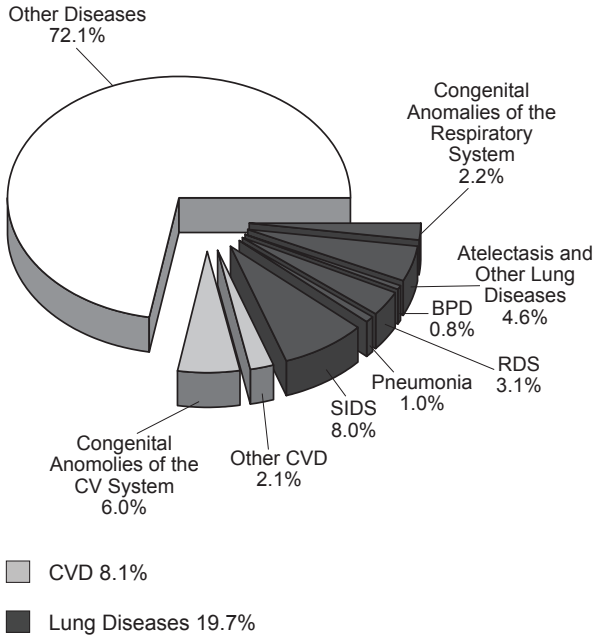


* Congenital CVD and congenital anomalies of the respiratory system (black bar) represented 41 percent of all infant deaths due to congenital anomalies.
† Between 1994 and 2004, congenital CVD declined 34 percent; congenital anomalies of the respiratory system declined 11 percent; other congenital anomalies increased 3 percent.
NA: Not available.
Note: Bolded diseases are those addressed in Institute programs.
Source: Vital Statistics of the United States, NCHS.

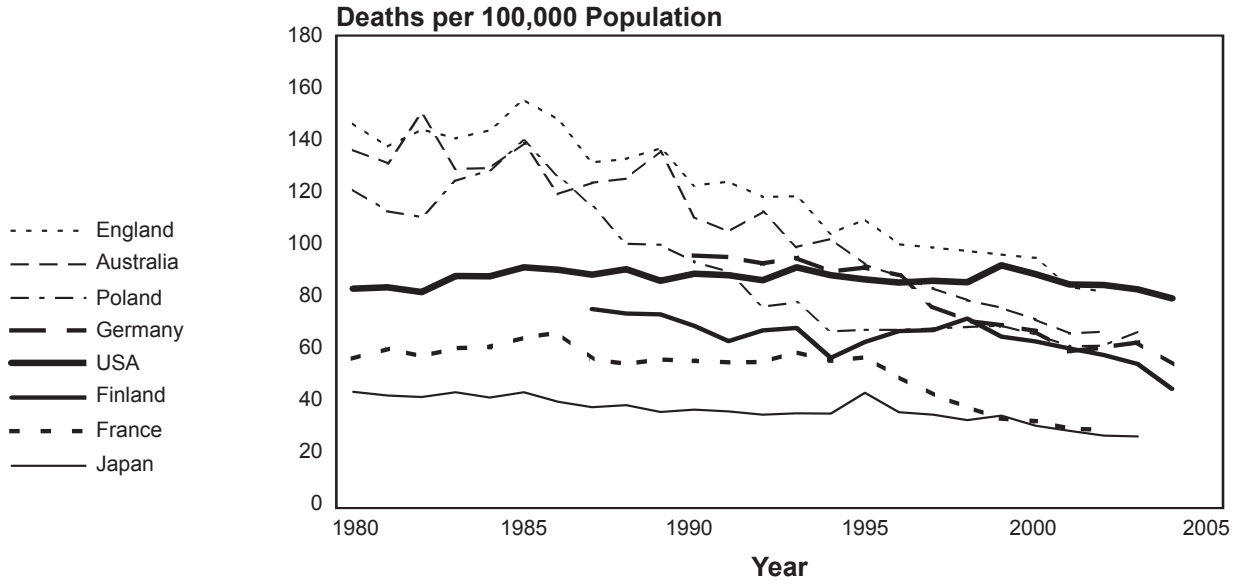
Deaths Under Age 1 Year Due to Cardiovascular and Lung Diseases, U.S., 2004

Cause of Death	Deaths Under Age 1
All Causes	27,936
Cardiovascular Diseases	**2,273**
Congenital Anomalies	1,682
Other	591
Lung Diseases	5,512
Sudden Infant Death Syndrome	**2,246**
Respiratory Distress Syndrome	**875**
Pneumonia	275
Bronchopulmonary Dysplasia (BPD)	221
Atelectasis of Newborn	441
Congenital Anomalies	**619**
Other Lung Diseases	835
Other Diseases	20,151

Note: Bolded diseases are those addressed in Institute programs.
Source: Vital Statistics of the United States, NCHS.

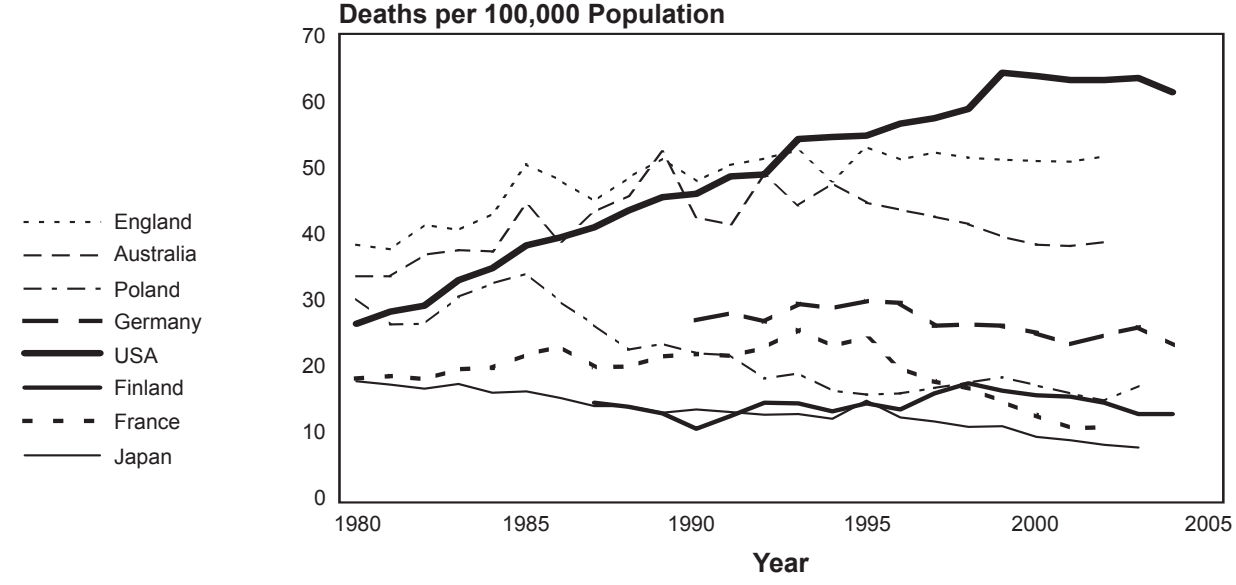


Death Rates* for Chronic Obstructive Pulmonary Disease in Men Ages 35+ Years, Selected Countries, 1980–2004



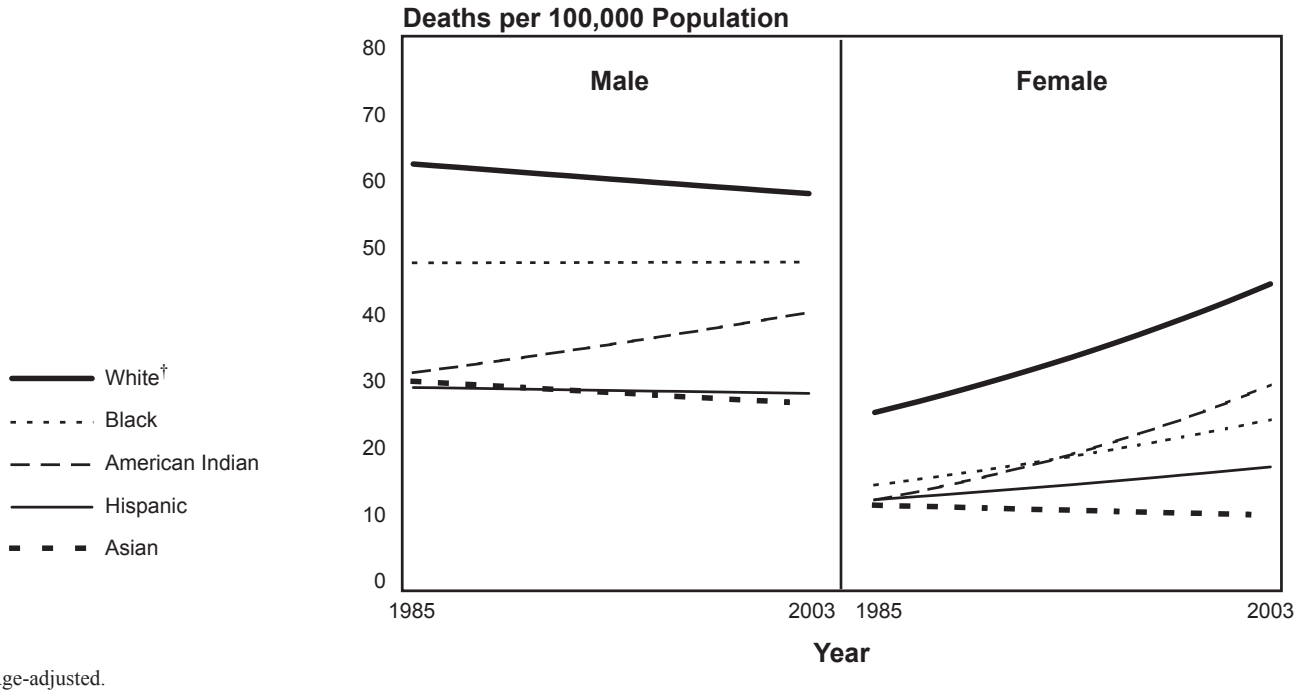
* Age-adjusted to the European Standard Population.
Source: World Health Statistics Annual, WHO.

Death Rates* for Chronic Obstructive Pulmonary Disease in Women Ages 35+ Years, Selected Countries, 1980–2004



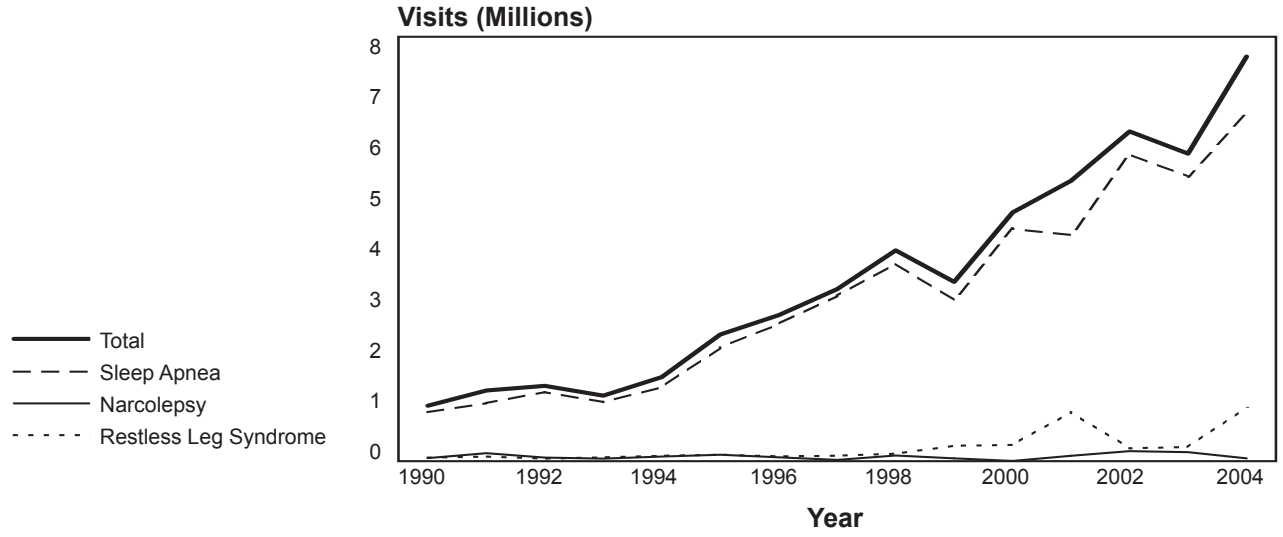
* Age-adjusted to the European Standard Population.
Source: World Health Statistics Annual, WHO.

Death Rates* for Chronic Obstructive Pulmonary Disease by Gender, Race, and Ethnicity, U.S., 1985–2003



* Age-adjusted.
† Non-Hispanic.
Note: Each line is a log linear regression derived from the actual rates. Rates from 1999–2002 are modified by the ICD revision comparability ratio.
Source: Vital Statistics of the United States, NCHS.

Physician Office Visits for Sleep Disorders, U.S., 1990–2004



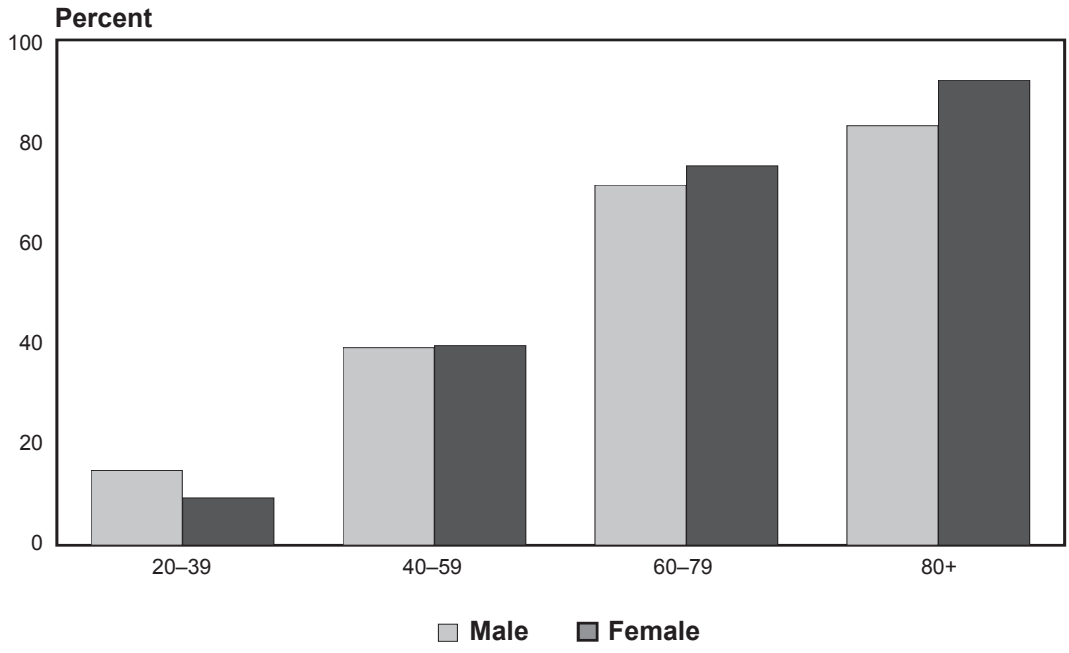
Source: National Ambulatory Medical Care Survey, NCHS.

Prevalence of Common Cardiovascular and Lung Diseases, U.S., 2004

Disease	Number
Cardiovascular Diseases*	79,400,000
Hypertension**	72,000,000
Coronary Heart Disease	15,800,000
Heart Failure	5,200,000
Stroke	5,700,000
Congenital Heart Disease†	1,000,000
Asthma‡	22,000,000
COPD^	24,000,000

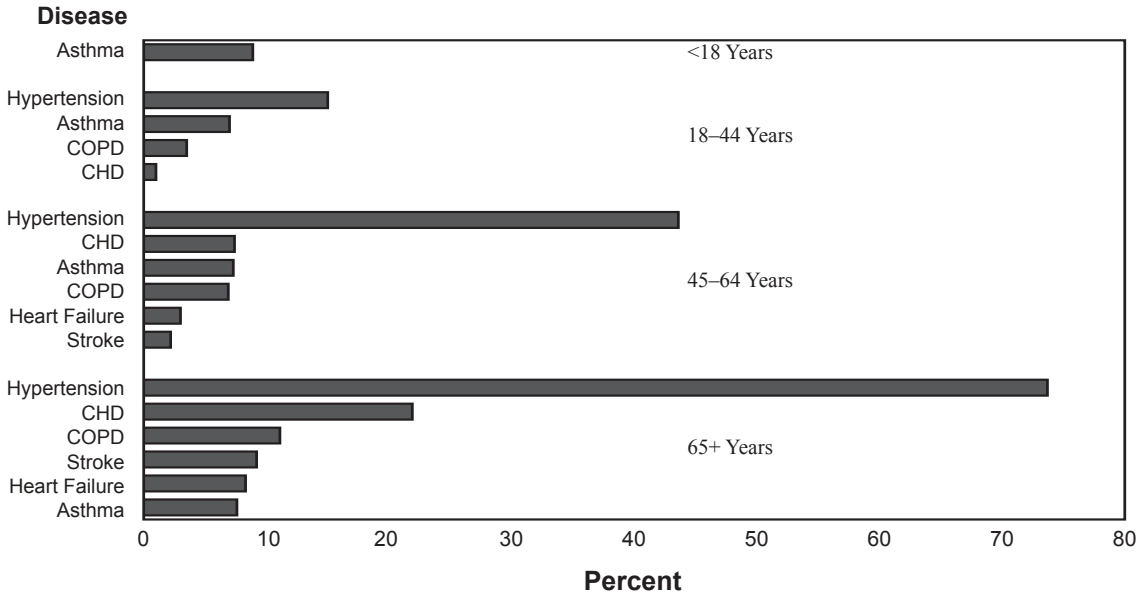
* Includes hypertension, CHD, heart failure, and stroke.
** Systolic blood pressure ≥ 140 mm Hg, diastolic blood pressure ≥ 90 mm Hg, on antihypertensive medication, or told twice of having hypertension.
† Range from 650,000 to 1,300,000 (Am Hrt J 2004;147:425–439).
‡ 12,000,000 of these had an asthma attack in the past 12 months.
^ An estimated 12,000,000 diagnosed and 12,000,000 undiagnosed.
Sources: National Health and Nutrition Examination Survey of NCHS and National Health Interview Survey of NCHS, except as noted.

Prevalence of Cardiovascular Diseases* in Adults by Age and Sex, U.S., 1999–2004



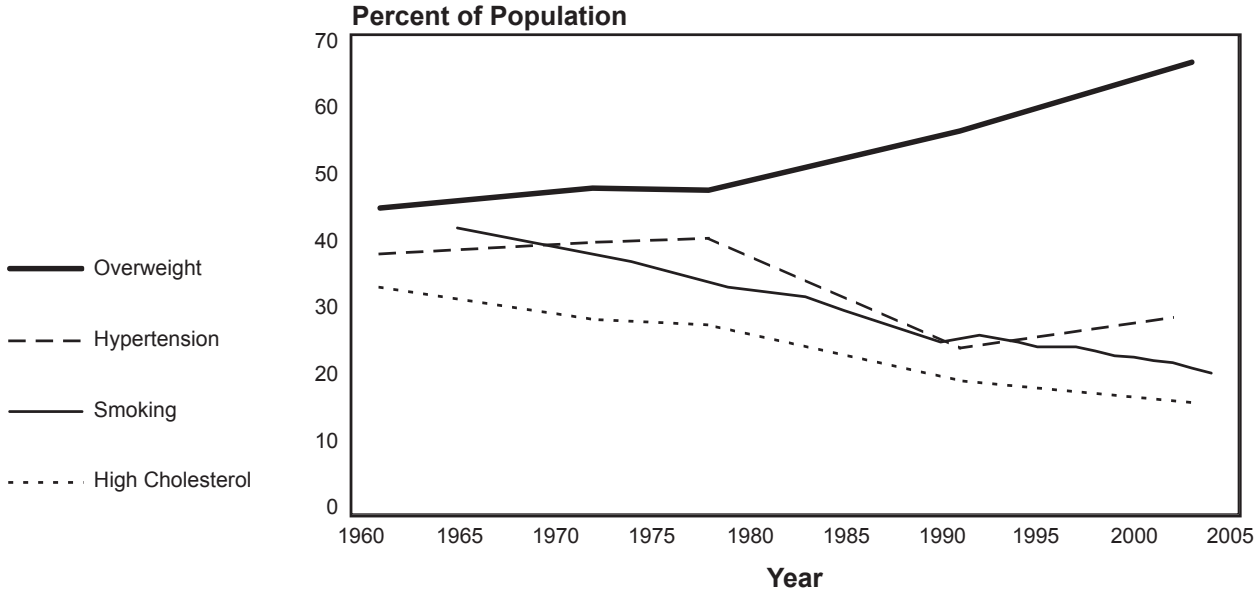
* Hypertension, CHD, cerebrovascular disease, or heart failure.
Source: NHANES, 1999–2004 extrapolated to U.S., 2004.

Prevalence of Common Cardiovascular and Lung Diseases by Age, U.S., 2004



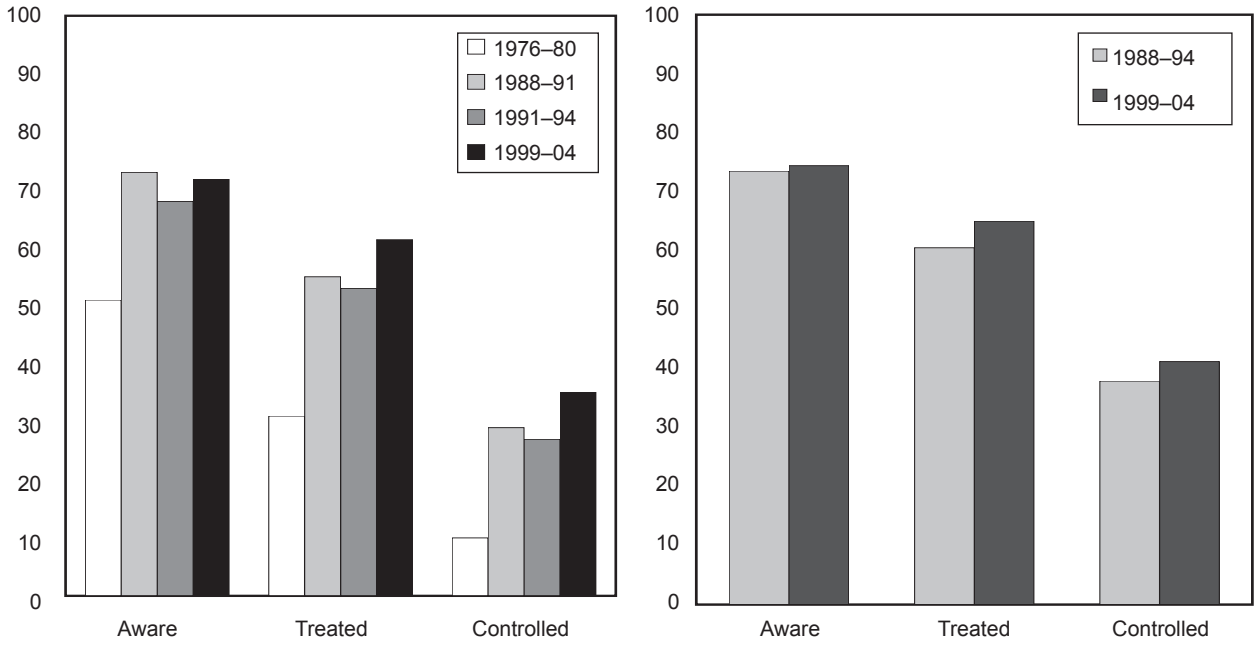
Source: NHIS and NHANES.

Prevalence of Cardiovascular Disease Risk Factors* in Adults, U.S., 1961–2004



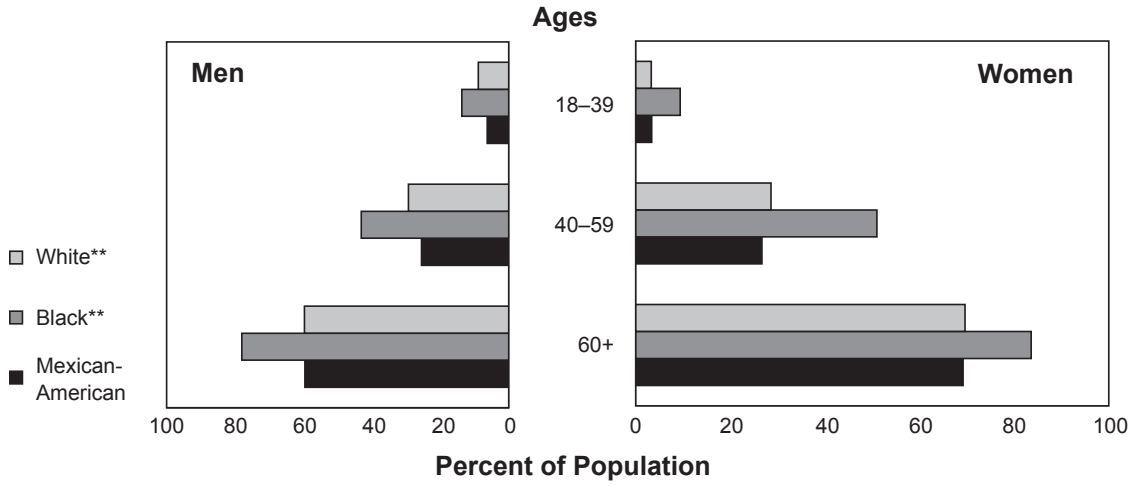
* Age-adjusted.
Note: Hypertension is systolic blood pressure > 140 mm Hg, diastolic blood pressure is > 90 mm Hg, or on antihypertensive medication. High cholesterol is 240+ mg/dl. Overweight is BMI 25+ kg/m^2.
Source: NHIS for smoking, ages ≥18 and NHANES for the other risk factors, ages 35–74.

Hypertensive Population Aware, Treated, and Controlled, Age 18+, U.S., 1976–80 to 1999–2004



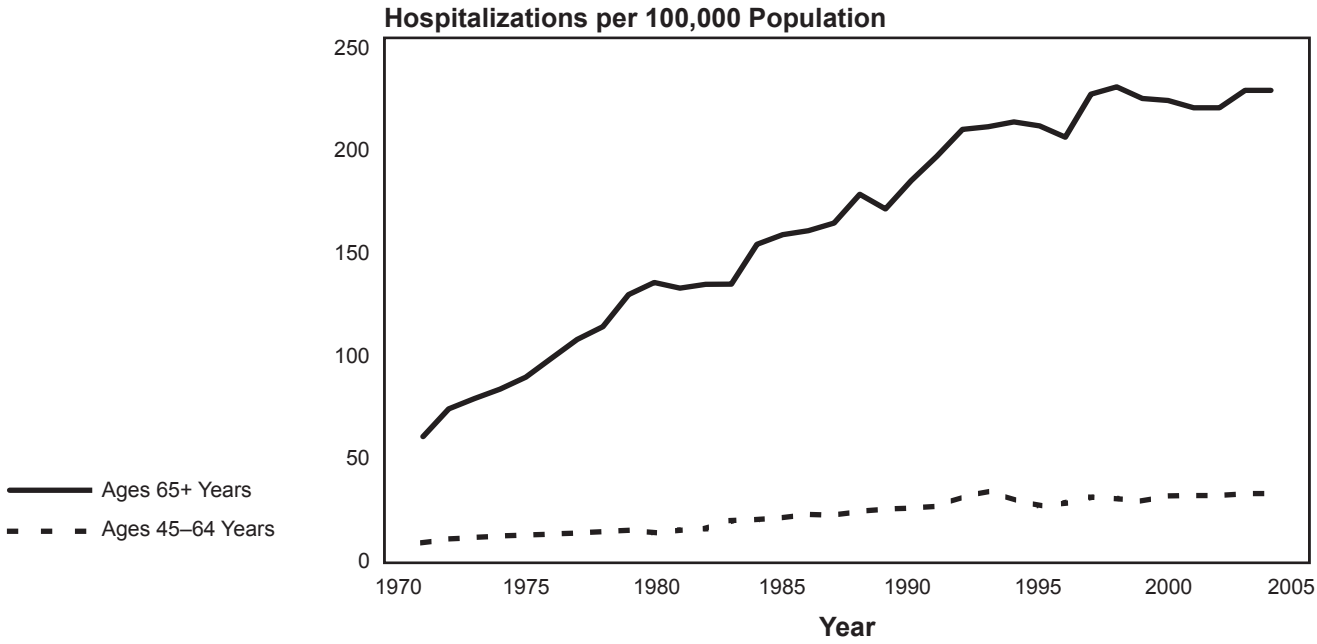
* Systolic blood pressure ≥ 140 mm Hg, diastolic blood pressure > 90 mm Hg, or on antihypertensive medication.
† Systolic blood pressure ≥ 140 mm Hg, diastolic blood pressure > 90 mm Hg, on antihypertensive medication. Here, "treated" includes medication use and other means.
Source: NHANES, NCHS.

Adult Population With Hypertension* by Age, Gender, and Race, U.S., 1999–2004



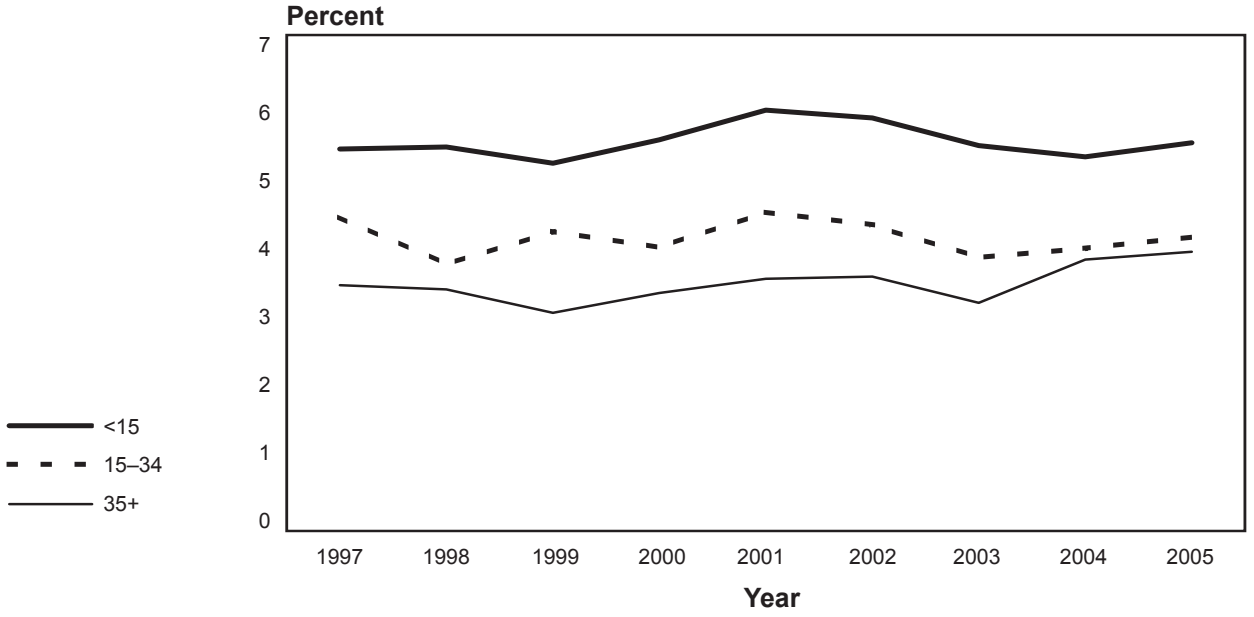
* Systolic blood pressure ≥ 140 mm Hg, diastolic blood pressure ≥ 90 mm Hg, on antihypertensive medication.
** Non-Hispanic.
Source: NHANES, NCHS.

Hospitalization Rates for Heart Failure, Ages 45–64 Years and 65+ Years, U.S., 1971–2004



Source: National Hospital Discharge Survey, NCHS.

Persons Experiencing Asthma Episodes in Previous 12 Months by Age, U.S., 1997–2005



Source: NHIS, NCHS.

Direct and Indirect Economic Costs of Illness by Major Diagnosis, U.S., 2007

	Amount (Dollars in Billions				Percent Distribution			
		Indirect Costs				Indirect Costs		
	Direct Costs*	Morbidity†	Mortality‡	Total	Direct Costs	Morbidity	Mortality	Total
Cardiovascular Disease	$ 283.2	$ 36.3	$112.3	$ 431.8	15.2%	17.0%	20.7%	16.5%
(including Blood Clotting)§	(66.5)	(8.0)	(26.2)	(100.7)	(3.6)	(3.7)	(4.8)	(3.8)
Lung Diseases**	94.8	27.9	30.9	153.6	5.1	13.0	5.7	5.9
Blood Diseases	10.2	0.7	2.9	13.8	0.5	0.3	0.5	0.5
Subtotal	388.2	64.9	146.1	599.2	20.8	30.3	26.9	22.8
Diseases of the Digestive System	201.9	11.0	24.9	237.8	10.8	5.1	4.6	9.1
Neoplasms	89.0	18.2	112.0	219.2	4.8	8.5	20.6	8.4
Mental Disorders	158.4	28.2	8.9	195.5	8.5	13.2	1.6	7.5
Diseases of the Nervous System	141.9	8.4	12.6	162.9	7.6	3.9	2.3	6.2
Diseases of the Musculoskeletal System	111.8	21.8	2.9	136.5	6.0	10.2	0.5	5.2
Diseases of the Genitourinary System	83.8	5.6	6.5	95.9	4.5	2.6	1.2	3.7
Endocrine, Nutritional, and Metabolic Diseases	77.0	7.0	19.9	103.9	4.1	3.3	3.7	4.0
Infectious and Parasitic Diseases	39.8	13.0	26.3	79.1	2.1	6.1	4.8	3.0
Diseases of the Skin	44.6	1.6	0.7	46.9	2.4	0.7	0.1	1.8
Other and Unallocated to Diseases	530.4	34.3	182.2	746.9	28.4	16.0	33.6	28.5
Total	**$1,866.8**	**$214.0**	**$543.0**	**$2,624.8**	**100%**	**100%**	**100%**	**100%**

* Direct costs are personal health care expenditures for hospital and nursing home care, drugs, home care, and physician and other professional services. The estimation method is based on Centers for Medicare & Medicaid Services (CMS) projections for total 2007 health expenditures by type of direct costs and NCHS estimates of direct costs in 1995 for each of the major diagnostic groups. The proportion of costs for 1995 for each diagnostic group is applied to the equivalent 2007 total by type of direct cost.

† Morbidity costs were estimated for 2007 by multiplying NCHS estimates for 1980 by a 1980–2007 percent inflation factor derived from the increase in mean earnings estimated by the Bureau of the Census.

‡ The mortality cost for each disease group was estimated for 2007 by first multiplying the number of deaths in 2003 in each age- and sex-specific group by the 2003 present value of lifetime earnings (latest available) discounted at 3 percent; second, summing these estimates for each diagnostic group; and third, multiplying the estimates by a 2003–2007 inflation factor (1.09) based on change in mean earnings.

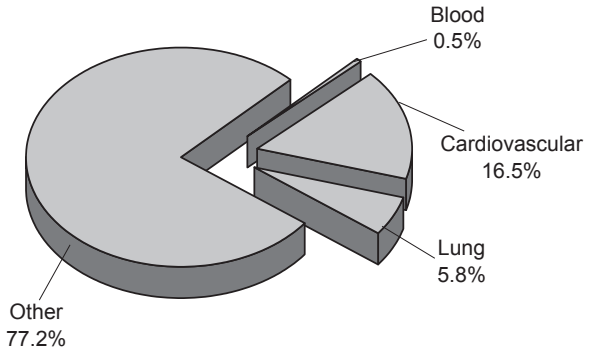
§ Costs of blood-clotting disease are estimated from predetermined proportions of CVD morbidity and mortality statistics for MI, cerebrovascular diseases, and diseases of arteries.

** Does not include lung cancer or leukemia.

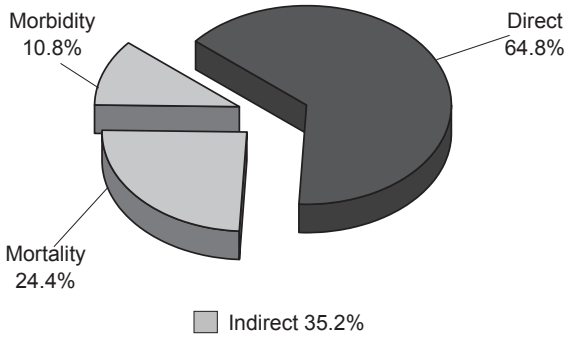
Note: Numbers may not add to totals due to rounding.

Source: Estimates by NHLBI; data from the NCHS, the CMS, the Bureau of the Census, and the Institute for Health and Aging, University of California, San Francisco.

Total Economic Costs, U.S., 2007



Economic Costs: Cardiovascular, Lung, and Blood Diseases, U.S., 2007



5. Institute-Initiated Programs Starting in FY 2006

More than two-thirds of the research supported by the NHLBI is initiated by individual investigators; the remainder is initiated by the Institute. Institute-initiated programs are developed in response to evolving national needs, Congressional mandates, and advances in scientific knowledge. Each initiative represents the outcome of extensive discussions and thorough reviews by representatives of the scientific community, Institute advisory committees, the Board of Extramural Advisors (BEA), and the National Heart, Lung, and Blood Advisory Council (NHLBAC). The advisory committees and the BEA, together with professional societies and NHLBI staff, continually review the progress of research within the NHLBI program areas, assess newly acquired knowledge, and identify research topics that offer the best opportunities or constitute the greatest needs. This planning process contributes to policy development at the national level by setting priorities among programs and establishing budgets for individual programs and projects.

Initiatives generally emanate as Requests for Applications (RFAs) for grants, including cooperative agreements, or Requests for Proposals (RFPs) for contracts. A smaller number of initiatives take the form of Program Announcements (PAs). Applications and proposals submitted in response to RFAs and RFPs compete among themselves for specific "set-aside" funds. Applications submitted in response to PAs generally compete with other investigator-initiated applications for funding.

RFA, RFP, and PA concepts prepared by the Institute are presented to the BEA, which reviews and prioritizes them. The concepts, along with the comments from the BEA, are then sent to the NHLBAC for review, comment, and concurrence. Initiatives that receive the concurrence of the NHLBAC are considered further by the NHLBI Director in the context of the Institute's budget, program priorities, review workload, and proposed mechanisms. These considerations guide the Director's subsequent decisions to approve initiatives for release. RFAs, RFPs, and PAs are announced in the *NIH Guide to Grants and Contracts*.

Applications and proposals submitted in response to RFAs and RFPs are reviewed by the NHLBI. Applications submitted in response to PAs are reviewed by the NIH Center for Scientific Review.

Descriptions of the Institute-initiated programs that began or were renewed (i.e., were funded) in FY 2006 are presented below according to NHLBI scientific programs. Also described are trans-NIH and interagency initiatives in which the NHLBI participates.

Heart and Vascular Diseases Program

Initiative Being Renewed

Pediatric Heart Network

The purpose of this renewal is to evaluate new treatments and management strategies that may benefit children with structural congenital heart disease, inflammatory heart disease, heart muscle disease, or arrhythmias.

New Initiatives

Heart Failure Clinical Research Network

The purpose of this RFA is to establish a clinical research network to accelerate research in the diagnosis and management of heart failure for improving outcomes through optimal application of existing therapies and evaluation of new therapies.

Innovative Technologies for Engineering Small Blood Vessels

The purpose of this RFA is to develop small (internal diameter less than 5 mm), functional vessel substitutes with improved biocompatibility and durability for later clinical evaluation as vessel replacement therapy in humans.

Research Career Development Programs in Vascular Medicine

The purpose of this RFA is to prepare physicians for academic leadership roles in vascular medicine through comprehensive training programs in

research methodology, risk assessment, diagnosis, treatment, and prevention of vascular disease.

Specialized Centers of Clinically Oriented Research in Vascular Injury, Repair, and Remodeling

The purpose of this SCCOR is to foster interdependent clinical and multidisciplinary basic research on molecular and cellular mechanisms of vascular injury, repair, and remodeling; promote patient-oriented research to improve prevention, detection, characterization, management, and treatment of vascular diseases; and enable the development of skills and research capabilities of new clinical investigators.

Weight Loss in Obese Adults With Cardiovascular Risk Factors: Clinical Interventions

The purpose of this RFA is to test the effectiveness of interventions delivered in routine clinical practice to achieve weight loss in obese patients who have other risk factors for CVD.

Lung Diseases Program

Initiative Being Renewed

Severe Asthma Research Program

The purpose of this renewal is to continue support for clinical research studies on the mechanistic basis of severe asthma and to determine how it differs from mild-to-moderate asthma.

New Initiative

Infectious Agents in the Origins of Chronic Lung Disease

The purpose of this RFA is to investigate the contribution of infectious agents or bioproducts derived from infectious agents to the early origin of chronic lung diseases.

Blood Diseases and Resources Program

New Initiatives

Clinical Hematology Research Career Development Program (K12)

The purpose of this RFA is to develop multidisciplinary career development programs in nonmalignant clinical hematology research in order to equip new academic investigators with the knowledge and skill necessary to address complex problems in blood diseases, transfusion medicine, and cellular therapies.

Critical Issues in Post-Phlebitic Syndrome

The purpose of this RFA is to support fundamental research on the biology of venous wall and venous valve function and their changes with time following deep vein thrombosis in order to accelerate preclinical studies and develop better management of post-phlebitic syndrome.

Proteomic Studies of Platelet Function

The purpose of this RFA is to support research on the application of proteomic tools to identify platelet disorders. The goal is to generate results that will lead to proteomic approaches and new markers of platelet function.

Sickle Cell Disease Clinical Research Network

The purpose of this RFA is to establish a clinical research network to test the efficacy of new therapies to treat and prevent SCD complications; create data sets that can be used to improve characterization of patients and their clinical course; apply genomic and proteomic techniques for improved diagnostic and therapeutic approaches; and expand the clinical application of multimodal therapies in SCD.

Specialized Centers of Clinically Oriented Research in Hemostatic and Thrombotic Diseases

The purpose of this SCCOR is to foster interdependent clinical and multidisciplinary basic research projects on hemostatic and thrombotic diseases.

Trans-NHLBI

Initiative Being Renewed

NHLBI Minority Undergraduate Biomedical Education Program

The purpose of this renewal is to facilitate the recruitment and retention of minority undergraduate students into biomedical science and increase the number of minority individuals involved in biomedical and behavioral research.

New Initiatives

Candidate Gene Association Resource

The purpose of this RFP is to provide a genotyping and bioinformatics center that will perform high-

throughput genotyping for candidate gene association studies and a genome-wide association study. These data will be combined with available phenotype data to form a genotype-phenotype resource for public use.

Cultural Competence and Health Disparity Academic Award

The purpose of this RFA is to develop core curricula and other educational materials at U.S. medical institutions that will increase the overall knowledge and skills of medical students, house staff, and other health professionals on the ethnic, cultural, religious, socioeconomic, and linguistic factors that contribute to health disparities and on culturally competent approaches to mitigate them.

Hispanic Community Health Study

The purpose of this RFP is to identify risk factors for cardiovascular and lung diseases in Hispanic populations and determine the role of acculturation in their prevalence and development.

Mechanisms Linking Short Sleep Duration and Risk of Obesity or Overweight

The purpose of this RFA is to determine the relationship between chronic sleep deficit and obesity and overweight. Research will be supported to elucidate the mechanisms associated with short sleep duration and weight gain due to altered metabolism, appetite, or inflammation.

Mentored Career Award for Faculty at Minority Institutions (K01)

The purpose of this RFA is to strengthen the scientific infrastructure of minority institutions by developing the research career and teaching skills of suitable faculty members in cardiovascular, lung, and blood diseases and sleep disorders.

Mentored Career Development Award To Promote Faculty Diversity in Biomedical Research (K01)

The purpose of this RFA is to support underrepresented faculty members from racial and ethnic minority groups and individuals with disabilities at academic institutions in health-related research. The goal is to establish a cadre of biomedical and behavioral researchers from diverse backgrounds who will significantly contribute to reducing and ultimately eliminating health disparities.

NHLBI Exploratory Program in Systems Biology

The purpose of this RFA is to apply "systems biology" approaches to innovative, high-risk, high-impact research on heart, lung, blood, and sleep physiology and pathophysiology by multidisciplinary teams of investigators. The systems biology approach will combine mathematical modeling and simulation to complement the traditional empirical and experimental approach of biomedical research.

NHLBI Innovative Research Grant Program

The purpose of this PA is to support studies that address promising, yet underdeveloped research topics and therapeutic approaches to heart, lung, and blood diseases and sleep disorders. The program is intended to encourage investigation of exciting new ideas by relaxing the need for preliminary data and demonstration of concept feasibility generally required by standard NIH research project (R01) reviews.

SBIR/STTR Technologies for Monitoring and Performing Resuscitation

The purpose of this PA is to encourage small businesses to participate in research and development of new approaches, tools, and biomaterials to provide bioengineering-based methodologies for monitoring and performing resuscitation.

Short Courses on Application of Genomics and Proteomics to Complex Heart, Lung, and Blood Diseases and Sleep Disorders

The purpose of this RFA is to develop, conduct, evaluate, and disseminate short-term courses on application of genomics and proteomics to heart, lung, and blood diseases and sleep disorders.

Short-Term Training Program To Increase Diversity in Health-Related Research

The purpose of this RFA is to promote diversity in undergraduate and health professional students by providing opportunities for them to participate in activities leading to research careers in cardiovascular, lung, and blood diseases and sleep disorders.

SNP Health Association Resource (SHARE)

The purpose of this RFP is to identify genetic variants associated with heart, lung, and blood diseases and sleep disorders through the application of large scale single nucleotide polymorphism (SNP) genotyping for genome-wide association analyses. In collaboration

with the National Center for Biotechnology Information, the Institute is developing a public-use data resource that will integrate genome-wide genotypic information with phenotypic information from multiple NHLBI studies.

SNP Typing for Association With Multiple Phenotypes From Existing Epidemiology Data (STAMPEED)

The purpose of this RFA is to identify genetic components related to heart, lung, and blood diseases and their risk factors using existing population, family, and other clinical studies. Investigators will seek to identify associations of genes with the presence of one particular disorder and examine interactions between genetic and environmental factors; susceptibility for multiple conditions; or associations of genes with disease risk factors, disease incidence, or therapeutic responsiveness.

Summer Institute Program To Increase Diversity in Health-Related Research

The purpose of this RFA is to develop the research skills of faculty and scientists from under-represented racial and ethnic groups and faculty and scientists with disabilities so that they may successfully compete for funding for biomedical and behavioral research relevant to heart, lung, and blood diseases and sleep disorders.

Trans-NIH

Initiatives Being Renewed

Bioengineering Research Grants (BRGs)

The purpose of this renewal is to encourage multidisciplinary, integrative research that applies systems approaches to prevent, detect, diagnose, treat, or understand health and behavior. The BRGs differ from the BRPs in that the research will be performed in a single laboratory, by a single investigator, or by a small group of investigators.

Bioengineering Research Partnerships (BRPs)

The purpose of this renewal is to encourage multidisciplinary, integrative research that applies systems approaches to prevent, detect, diagnose, treat, or understand health and behavior.

Blood and Marrow Transplant Clinical Trials Network

The purpose of this renewal is to conduct Phase II trials on transplantation methodologies to improve long-term outcome following transplantation and devise procedures for protocol development, protocol implementation, and data management that will enable collaboration with other NIH-funded cooperative research programs and increase the efficiency of conducting trials in blood and marrow transplantation.

Short-Term Courses in Human Embryonic Stem Cell Culture Techniques

The purpose of this RFA is to develop, conduct, evaluate, and disseminate short-term courses on laboratory research techniques for working with human embryonic stem cell lines.

New Initiatives

Academic Research Enhancement Award

The purpose of this PA is to stimulate research at educational institutions that provide baccalaureate or advanced training for research scientists, but that have not been major recipients of NIH support.

Animal Models of Diabetic Complications Consortium

The purpose of this RFA is to establish Pathobiology Sites that will support the Animal Models of Diabetic Complications Consortium. The Sites will propose new mouse models that will faithfully replicate one or more diabetic complications, and will discover and characterize the basic pathophysiologic mechanisms underlying disease in these and other models of complications.

Biology of RNA Interference (RNAi): Stability, Delivery, and Processing by Tissues

The purpose of this RFA is to stimulate research toward (1) understanding uptake and processing of RNAi by target tissues; (2) assessing stability, half-life, and off-target effects in target tissues; and (3) determining optimal delivery methods for uptake by the target tissues.

Design and Analysis of Genome-Wide Association Studies

The purpose of this RFA is to develop and test innovative study designs and analytical strategies to perform genome-wide association studies on diseases affecting heart, lung, blood, or sleep.

Directed Stem Cell Differentiation for Cell-Based Therapies for Heart, Lung, Blood, and Aging Diseases

The purpose of this PA is to support research to define factors controlling differentiation of stem cells in vitro or in vivo. The goal is to develop methods to direct differentiation of stem cells to yield replacement cells for clinical use or to develop methods to stimulate

differentiation of resident stem cells in vivo for regeneration or repair of heart, blood vessels, lungs, and blood.

Exploratory and Development Research Grants for Investigation in Rare Diseases

The purpose of this PA is to support investigators with innovative approaches to understanding, treating, and preventing rare diseases associated with heart, lung, and blood diseases and sleep disorders. Availability of R21 awards for such individuals is expected to allow them to obtain research support without the need for the large amounts of preliminary data that often present a barrier to entry into the NIH grants system.

Exploratory/Developmental Bioengineering Research Grants

The purpose of this PA is to encourage innovative, high-risk, high-impact bioengineering research for which preliminary results have not yet been obtained. The research may explore approaches and concepts new to a particular subject area; research and development of new technologies, techniques or methods; or initial research and development of data upon which significant future research may be built.

Innovations in Biomedical Computational Science and Technology

The purpose of this PA is to promote research and development in computational science and technology that will support rapid progress in biomedical research.

Ischemic Stroke: Novel Targets and Therapy Development

The purpose of this RFA is to identify new molecular targets, explore promising agents, and develop innovative treatments for cerebral ischemia. The initiative seeks to enhance our understanding of brain hemostasis (stoppage of bleeding), including endothelial properties, expression and regulation of coagulant activity, and clot composition.

Mentored Patient-Oriented Research Career Development Award (K23)

The purpose of this PA is to support the career development of investigators who have made a commitment to focus their efforts on patient-oriented research.

Muscular Dystrophy: Pathogenesis and Therapies

The purpose of this PA is to support basic, translational, and patient-oriented studies of Duchenne-Becker muscular dystrophy, facioscapulohumeral dystrophy, and other forms of muscular dystrophy.

Nutrition and Diet in the Causation, Prevention, and Management of Heart Failure

The purpose of this PA is to encourage research on the role of nutrition and diet in the causation, prevention, and treatment of cardiomyopathies and heart failure. The goal is to develop a satisfactory science base for preventive approaches in high-risk individuals and for rational nutritional management of patients in various stages of heart failure.

Obese and Diabetic Intrauterine Environment: Long-Term Metabolic or Cardiovascular Consequences in the Offspring

The purpose of this RFA is to investigate the effect of maternal obesity and diabetes on mechanisms that could potentially contribute to obesity, cardiovascular, or metabolic disease in the offspring; and to determine if and how maternal overnutrition elicits permanent metabolic or cardiovascular disease in the fetus.

Pilot and Feasibility Program Related to the Kidney

The purpose of this PA is to support high-risk pilot and feasibility research that will enable subsequent submission of R01 applications relevant to the study of acute and chronic kidney diseases and their complications.

Trans-PHS

New Initiative

Community Participation in Research

The purpose of this PA is to conduct community-based research on health promotion, disease prevention, and health disparities. The NHLBI will support joint projects conducted by researchers and communities in hypertension, cardiovascular fitness, obesity, asthma, SCD, and hereditary blood disorders.

6. Institute Public Advisory Committees

National Heart, Lung, and Blood Advisory Council

Structure

Chair: Elizabeth G. Nabel, M.D., Director, NHLBI

Executive Secretary: Stephen C. Mockrin, Ph.D., Director, Division of Extramural Research Activities, NHLBI, National Institutes of Health, Bethesda, MD 20892; 301–435–0260

The Secretary of HHS appoints 18 members: 12 members are leading representatives of the health and scientific disciplines (including public health and behavioral or social sciences), and 6 are from the general public and are leaders in the fields of public policy, law, health policy, economics, and management.

Members are appointed for overlapping terms of 4 years.

The Council includes the following ex officio members:

- Secretary, HHS
- Director, NIH
- Director, NHLBI
- Chief Medical Director, or Designee, Veterans Affairs
- Assistant Secretary of Defense for Health Affairs, or Designee.

Functions

The NHLBAC reviews applications for research grants, cooperative agreements, and training grants in heart, blood vessel, lung, and blood diseases; sleep disorders; and blood resources, and recommends scientific projects that merit support to the Director, NHLBI.

The Council advises the Secretary, HHS, the Assistant Secretary for Health, HHS, and the Directors, NIH and NHLBI, on matters relating to causes, prevention, and methods of diagnosis and treatment of diseases and resources within the purview of the Institute. As stated in its charter, the Council also "may review any grant, contract, or cooperative agreement proposed to be made or entered into by the Institute; may make recommendations to the Director of the Institute respecting research conducted at the Institute; may collect, by correspondence or by personal investigation, information as to studies that are being carried on in the United States or any other country with respect to the cause, prevention, diagnosis, and treatment of heart, blood vessel, lung, and blood diseases, and to the use of blood and blood products and the management of blood resources and with the approval of the Director of the Institute, make available such information through appropriate publications for the benefit of public and private health entities and health professions personnel and scientists and for the information of the general public; and may appoint subcommittees and convene workshops and conferences."

The Council may also make recommendations to the Director, NIH and other authorized officials regarding the acceptance of conditional gifts pursuant to section 2501 of the Public Health Service Act.

Meetings

The Chair convenes meetings not fewer than four times a year and approves the agenda.

National Heart, Lung, and Blood Advisory Council Membership*

Elizabeth G. Nabel, M.D.
Chair
National Heart, Lung, and Blood Institute

Gordon R. Bernard, M.D. (2006)
Vanderbilt University School of Medicine

Roberto Bolli, M.D. (2007)
University of Louisville

Richard C. Boucher, Jr., M.D. (2007)
University of North Carolina at Chapel Hill

Maria R. Costanzo, M.D. (2006)
Edward Cardiovascular Institute

Victor J. Dzau, M.D. (2009)
Duke University

Kim A. Eagle, M.D. (2006)
University of Michigan

Charles T. Esmon, Ph.D. (2008)
Oklahoma Medical Research Foundation

Frances C. Henderson, Ed.D. (2006)
University of Mississippi Medical Center

Katherine A. High, M.D. (2008)
University of Pennsylvania School of Medicine

Helen H. Hobbs, M.D. (2009)
University of Texas Southwestern Medical Center

Jennie R. Joe, M.D., Ph.D. (2009)
University of Arizona

Hoxi J. Jones (2008)
Texas Health and Human Services Commission

Robert F. Lemanske, Jr., M.D. (2007)
University of Wisconsin Hospital

Joseph Loscalzo, M.D., Ph.D. (2009)
Brigham and Women's Hospital

Jeffrey McCullough, M.D. (2008)
University of Minnesota

Ngai X. Nguyen, M.D. (2006)
Private Practitioner

Patricia W. Wahl, Ph.D. (2008)
University of Washington

Ex Officio Members

Robert L. Jesse, M.D., Ph.D.
McGuire Veterans Affairs Medical Center

Michael O. Leavett
Department of Health and Human Services

Cdr. Richard T. Mahon, M.D.
Naval Medical Research Center

Elias A. Zerhouni, Jr., M.D.
National Institutes of Health

* Current as of October 2006. The current roster, containing full addresses for the NHLBI Advisory Council and Committees, can be obtained from the Internet at http://www.nhlbi.nih.gov/meetings/nhlbac/roster.htm.

Program Advisory and Review Committee

Sickle Cell Disease Advisory Committee

Chair: Floyd D. Armstrong, Ph.D., University of Miami School of Medicine

Executive Secretary: Robert B. Moore, Ph.D., Health Scientist Administrator, Division of Blood Diseases and Resources, NHLBI, National Institutes of Health, Bethesda, MD 20892; 301–435–0050

The Sickle Cell Disease Advisory Committee advises the Secretary and the Assistant Secretary for Health, HHS and the Directors of the NIH, the NHLBI, and the DBDR on matters related to the Sickle Cell Disease Program and makes recommendations concerning planning, execution, and evaluation of all aspects of the program.

Membership*

Michael R. DeBaun, M.D. (2007)
Washington University School of Medicine

Johnson Haynes, Jr., M.D. (2007)
University of South Alabama College of Medicine

Frans A. Kuypers, Ph.D. (2008)
Children's Hospital Oakland Research Institute

Shirley Miller (2008)
Children's Medical Center of Dallas

Dorothy C. Moore, M.D. (2007)
University of Medicine and Dentistry of New Jersey

Eugene P. Orringer, M.D. (2008)
University of North Carolina at Chapel Hill

Russell E. Ware, M.D., Ph.D. (2006)
St. Jude Children's Research Hospital

Ex Officio Members

Joseph Desimone, Ph.D.
Department of Veterans Administration, Chicago

Marie C. Earley, Ph.D.
Centers for Disease Control and Prevention

Marie Y. Mann, M.D.
Health Resources and Services Administration

Robert L. Sheffler, M.D.
Tripler Army Medical Center

Elias A. Zerhouni, Jr., M.D.
National Institutes of Health

Sleep Disorders Research Advisory Board

Chair: Phyllis C. Zee, M.D., Ph.D., Northwestern University Medical School

Executive Secretary: Michael J. Twery, Ph.D., Acting Director, National Center on Sleep Disorders Research, NHLBI, National Institutes of Health, Bethesda, MD 20892; 301–435–0202.

The Sleep Disorders Research Advisory Board advises the Directors of the NIH, the NHLBI, and the NCSDR on matters related to the scientific activities carried out by and through the Center and policies regarding such activities, including the identification of research priorities for coordination of sleep and sleep disorders research by the NIH and other federal, professional, and voluntary organizations.

Membership*

Sonia Ancoli-Israel, Ph.D. (2010)
University of California, San Diego School of Medicine

Sheila C. Connolly, R.N. (2007)
Restless Legs Syndrome Foundation

Estelle B. Gauda, M.D. (2010)
Johns Hopkins University School of Medicine

Elizabeth M. Johns (2008)
Patient Advocate for Sleep-Disordered Breathing

F. Javier Nieto, M.D., Ph.D. (2010)
University of Wisconsin School of Medicine

Gina R. Poe, Ph.D. (2007)
University of Michigan Medical Center

*Current as of October 2006.

Stuart F. Quan, M.D. (2008)
University of Arizona College of Medicine

Howard P. Roffwarg, M.D. (2009)
University of Mississippi Medical Center

Michael H. Smolensky, Ph.D. (2008)
University of Texas

Lorraine L. Wearley, Ph.D. (2007)
Lorraine Wearley Consulting, LLC

Ex Officio Members

Elizabeth G. Nabel, M.D.
NHLBI, National Institutes of Health

Thomas J. Balkin, Ph.D.
Walter Reed Army Institute of Research

Cristina Beato, M.D.
Department of Health and Human Services

Robert W. Greene, M.D., Ph.D.
Veterans Administration, North Texas Medical Center

Merrill M. Mitler, Ph.D.
NINDS, National Institutes of Health

Andrew Monjan, Ph.D.
NIA, National Institutes of Health

Michael J. Twery, Ph.D.
NCSDR, National Institutes of Health

Marian Willinger, Ph.D.
NICHD, National Institutes of Health

Elias A. Zerhouni, Jr., M.D.
National Institutes of Health

Heart, Lung, and Blood Initial Review Group

Scientific Review Administrator: Jeffery H. Hurst, Ph.D., Health Science Administrator, Division of Extramural Research Activities, NHLBI, National Institutes of Health, Bethesda, MD 20892; 301–435–0303

The Heart, Lung, and Blood Initial Review Group provides initial technical merit review for the NHLBAC and the Director, NHLBI. This group consists of two subcommittees: the Heart, Lung, and Blood Program Project Review Committee and the Clinical Trials Review Committee.

Heart, Lung, and Blood Program Project Review Committee

Chair: Donna Przepiorka, M.D., Ph.D., University of Tennessee College of Medicine

Scientific Review Administrator: Jeffery H. Hurst, Ph.D., Health Scientist Administrator, Division of Extramural Research Activities, NHLBI, National Institutes of Health, Bethesda, MD 20892; 301–435–0303

The Heart, Lung, and Blood Program Project Review Committee provides initial technical merit review for the NHLBAC and the Director, NHLBI on program project applications proposing research in the areas of heart, lung, and blood diseases and resources.

Membership*

Edward Abraham, M.D. (2009)
University of Alabama at Birmingham

Peng-Sheng Chen, M.D. (2010)
Cedars-Sinai Medical Center

Louis J. Dell'Italia, M.D. (2008)
University of Alabama

Kathy K. Griendling, Ph.D. (2008)
Emory University

Samuel Hawgood, M.D. (2010)
University of California, San Francisco

Joseph R. Haywood, Ph.D. (2007)
Michigan State University

Timothy T. Hla, Ph.D. (2008)
University of Connecticut School of Medicine

*Current as of October 2006.

Sriram Krishnaswamy, Ph.D. (2009)
Children's Hospital of Philadelphia

Renee C. LeBoeuf, Ph.D. (2007)
University of Washington School of Medicine

Diane J. Nugent, M.D. (2009)
University of California, Los Angeles

Jose M. Ordovas, Ph.D. (2007)
Tufts University

Bruce R. Pitt, Ph.D. (2009)
Universitiy of Pittsburgh

Howard A. Rockman, M.D. (2008)
Duke University Medical Center

Ann Marie Schmidt, M.D., Ph.D. (2010)
Columbia University

Susan S. Smyth, M.D., Ph.D. (2009)
University of Kentucky

Robert A. Wise, M.D. (2010)
Johns Hopkins University School of Medicine

Katherine E. Yutzey, Ph.D. (2010)
Children's Hospital Research Foundation

Clinical Trials Review Committee

Chair: Ileana L. Pina, M.D., Case Western Reserve University

Scientific Review Administrator: Patricia A. Haggerty, Ph.D., Health Science Administrator, Division of Extramural Research Activities, NHLBI, National Institutes of Health, Bethesda, MD 20892; 301–435–0288

The Clinical Trials Review Committee provides initial technical merit review for the NHLBAC and the Director of the NHLBI on clinical trial applications for the support of studies to evaluate preventive or therapeutic measures of blood, cardiovascular, or lung diseases.

Membership*

Walter T. Ambrosius, Ph.D. (2010)
Wake Forest University

Antonio Anzueto, M.D. (2008)
University of Texas Health Science Center
at San Antonio

Ulrika M. Birgersdotter-Green, M.D. (2009)
University of California, San Diego

Ivan Chan, Ph.D. (2010)
Merck Research Laboratories

John E. Connett, Ph.D. (2007)
University of Minnesota

Robert M. Elashoff, Ph.D. (2007)
University of California, Los Angeles

Terry B. Gernsheimer, M.D. (2009)
University of Washington School of Medicine

Robert A. Harrington, M.D. (2010)
Duke School of Medicine

John B. Kostis, M.D. (2008)
University of Medicine and Dentistry of New Jersey

Cora E. Lewis, M.D. (2008)
University of Alabama at Birmingham

Pamela Ouyang, M.D. (2010)
Johns Hopkins University School of Medicine

Julio A. Panza, M.D. (2009)
Washington Hospital Center

Lynda H. Powell, Ph.D. (2007)
Rush-Presbyterian-St. Luke's Medical Center

John J. Reilly, M.D. (2009)
Brigham and Women's Hospital

Alexis A. Thompson, M.D. (2008)
Northwestern University Medical School

*Current as of October 2006.

National Heart, Lung, and Blood Institute Special Emphasis Panel

The Institute has established the NHLBI Special Emphasis Panel (SEP) to perform initial peer review of applications and proposals that were previously handled by ad hoc committees. Concept review, previously handled by divisional program advisory committees, has also been incorporated into the SEP system. The SEP, which has neither a fixed membership nor a set meeting schedule, is constituted to provide required peer review expertise at precisely the time that it is needed.

Board of Scientific Counselors

Chair: Ivor J. Benjamin, M.D., University of Utah Health Sciences Center

Executive Secretary: Robert S. Balaban, Ph.D., Director, Laboratory Research Program, NHLBI, National Institutes of Health, Bethesda, MD 20892; 301–496–2116

The Board of Scientific Counselors advises the Director and the Deputy Director for Intramural Research, NIH, and the Directors of NHLBI and the Division of Intramural Research, NHLBI, on the intramural research programs of the NHLBI.

Membership*

Nancy Berliner, M.D. (2007)
Yale University School of Medicine

Stephen Black, Ph.D. (2011)
Medical College of Georgia

Eduardo Marban, M.D., Ph.D. (2011)
Johns Hopkins University

Elizabeth M. McNally, M.D., Ph.D. (2010)
University of Chicago

Gary K. Owens, M.D., Ph.D. (2010)
University of Virginia School of Medicine

Edwin W. Taylor, Ph.D. (2009)
University of Chicago

Alan S. Verkman, M.D., Ph.D. (2009)
University of California, San Francisco

Sally E. Wenzel-Morganroth, M.D. (2007)
National Jewish and Medical Research Center

*Current as of October 2006.

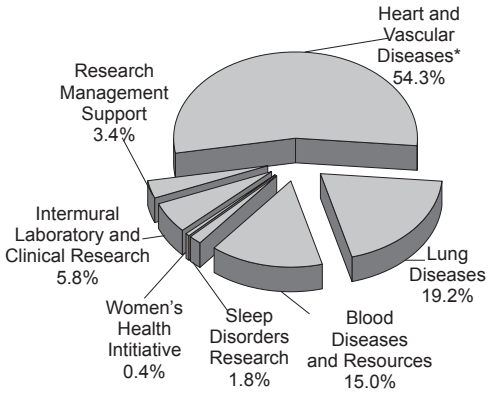
7. Fiscal Year 2006 Budget Overview

NHLBI Obligations by Funding Mechanism: Fiscal Year 2006

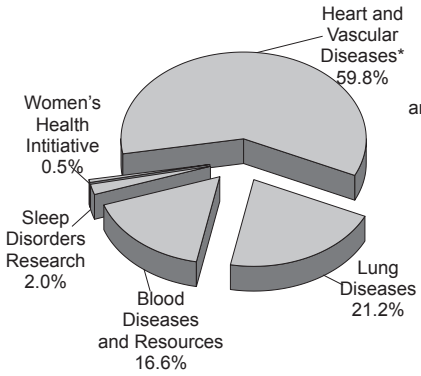
Funding Mechanism	Obligated Dollars* (Thousands)	Percent of Total NHLBI Budget
Research Project Grants†	$2,011,049	69.5%
SCORs/SCCORs	114,197	3.9
Sickle Cell Centers	23,928	0.8
Centers for AIDS Research	2,961	0.1
Other Research Grants	123,802	4.3
Research Careers Programs‡	*70,365*	*2.4*
Training Programs	89,179	3.1
Research and Development Contracts	262,851	9.1
Intramural Laboratory and Clinical Research	168,346	5.8
Research Management and Support§	97,214	3.4
Research Facilities Construction Grants	—	—
Total Obligations	**$2,893,527**	**100%**

* Excludes funds provided by other agencies by means of a reimbursable agreement.
† Includes $72,460 for Small Business Innovation Research (SBIR) Grants/Small Business Technology Transfer Grants (STTR).
‡ Research Career Programs are a subset of Other Research Grants and are not added as a distinct funding mechanism.
§ Excludes OD and DIR research contracts, which are included in R&D contracts.

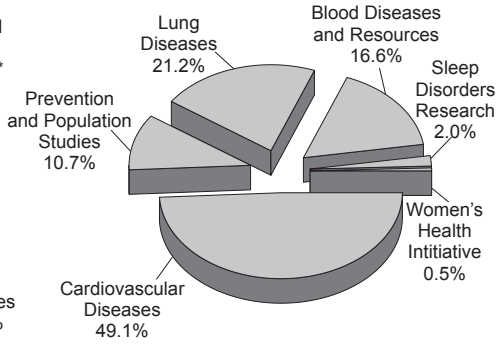
NHLBI Total Obligations by Budget Category



NHLBI Extramural Obligations by Program



NHLBI Extramural Obligations by Division



* Includes Cardiovascular Diseases and Prevention and Population Studies.

For detailed data on FY 2006:

- Research grants, see Chapters 9 and 11
- Research and development contracts, see Chapters 10 and 11
- Research training and career development, see Chapter 13
- Geographic distribution of awards, see Chapter 14.

NHLBI Extramural Obligations by Program: Fiscal Year 2006

Program	Obligated Dollars (Thousands)	Percent of NHLBI Extramural Budget
Heart and Vascular Diseases*	$1,570,605	59.8%
Lung Diseases	556,865	21.2
Blood Diseases and Resources	434,937	16.6
Sleep Disorders Research	53,435	2.0
Women's Health Initiative	12,124	0.5
Total, Extramural Obligations	**$2,627,966**	**100%**

* Includes Cardiovascular Diseases and Prevention and Population Sciences.

NHLBI Cardiovascular Diseases Program* Obligations by Funding Mechanism: Fiscal Year 2006

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	$1,014,344	78.7%
SCORs/SCCORs	57,456	4.5
Other Research Grants	38,370	3.0
Research Career Programs†	*29,076*	*2.3*
Training Programs	44,040	3.4
Research and Development Contracts	135,397	10.5
Total, Cardiovascular Diseases	**$1,289,607**	**100%**

* Includes Cardiovascular Diseases only.
† Research Career Programs are a subset of Other Research Grants and are not added as a distinct funding mechanism.

NHLBI Prevention and Population Sciences Program Obligations by Funding Mechanism: Fiscal Year 2006

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	$200,902	71.5%
SCORs/SCCORs	—	—
Other Research Grants	7,529	2.7
*Research Career Programs**	*5,798*	*2.1*
Training Programs	6,768	2.4
Research and Development Contracts	65,799	23.4
Total, Prevention and Population Sciences	**$280,998**	**100%**

* Research Career Programs are a subset of Other Research Grants and are not added as a distinct funding mechanism.
Note: Numbers may not add to total due to rounding.

NHLBI Lung Diseases Program
Obligations by Funding Mechanism: Fiscal Year 2006

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	$426,663	76.6%
SCORs/SCCORs	30,790	5.5
Other Research Grants	52,000	9.3
*Research Career Programs**	*20,319*	*3.6*
Training Programs	22,007	4.0
Research and Development Contracts	25,405	4.6
Total, Lung Diseases	**$556,865**	**100%**

* Research Career Programs are a subset of Other Research Grants and are not added as a distinct funding mechanism.

NHLBI Blood Diseases and Resources Program
Obligations by Funding Mechanism: Fiscal Year 2006

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	$326,371	75.0%
SCORs/SCCORs	19,736	4.5
Sickle Cell Centers	23,928	5.5
Centers for AIDS Research	2,961	0.7
Other Research Grants	24,131	5.5
*Research Career Programs**	*13,407*	*3.1*
Training Programs	14,181	3.3
Research and Development Contracts	23,629	5.4
Total, Blood Diseases and Resources	**$434,937**	**100%**

* Research Career Programs are a subset of Other Research Grants and are not added as a distinct funding mechanism.

National Center on Sleep Disorders Research Program
Obligations by Budget Mechanism: Fiscal Year 2006

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	$42,769	80.0%
SCORs/SCCORs	6,215	11.6
Other Research Grants	1,772	3.3
*Research Career Programs**	*1,765*	*3.3*
Training Programs	2,182	4.1
Research and Development Contracts	497	0.9
Total, Sleep Disorders Research	**$53,435**	**100%**

* Research Career Programs are a subset of Other Research Grants and are not added as a distinct funding mechanism.
Note: Numbers may not add to total due to rounding.

Women's Health Initiative
Obligations by Funding Mechanism: Fiscal Year 2006

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	$ —	—%
SCORs/SCCORs	—	—
Other Research Grants	—	—
*Research Career Programs**	—	—
Training Programs	—	—
Research and Development Contracts	12,124	100.0
Total, Women's Health Initiative	**$12,124**	**100%**

* Research Career Programs are a subset of Other Research Grants and are not added as a distinct funding mechanism.

8. Long-Term Trends

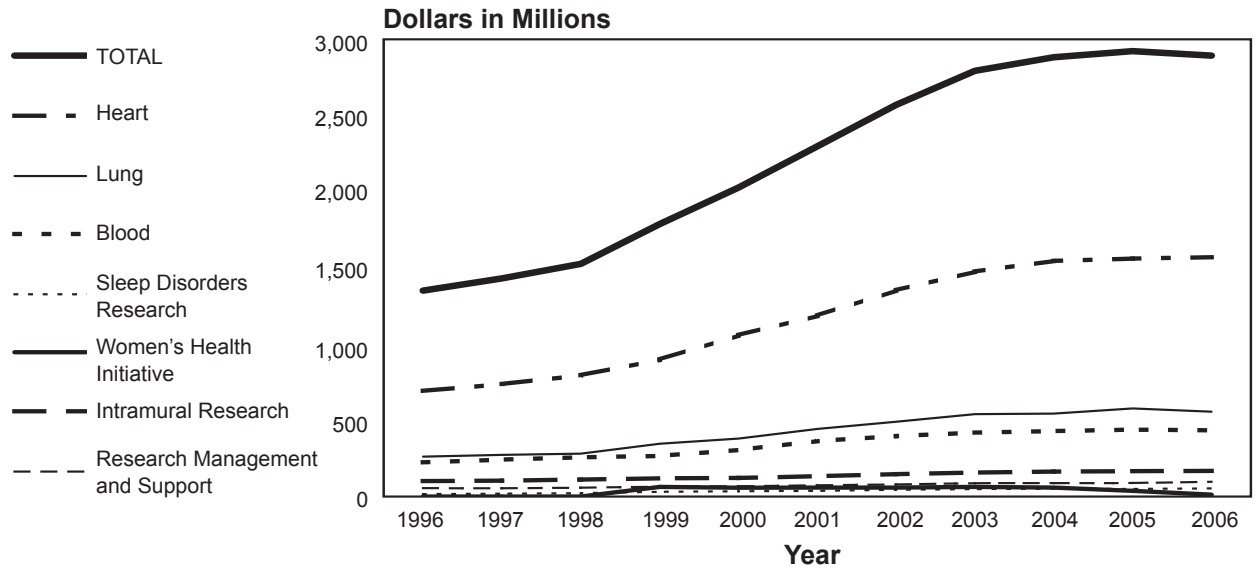
Budget History of the NHLBI: Fiscal Years 1950–2006

Dollars (Thousands)

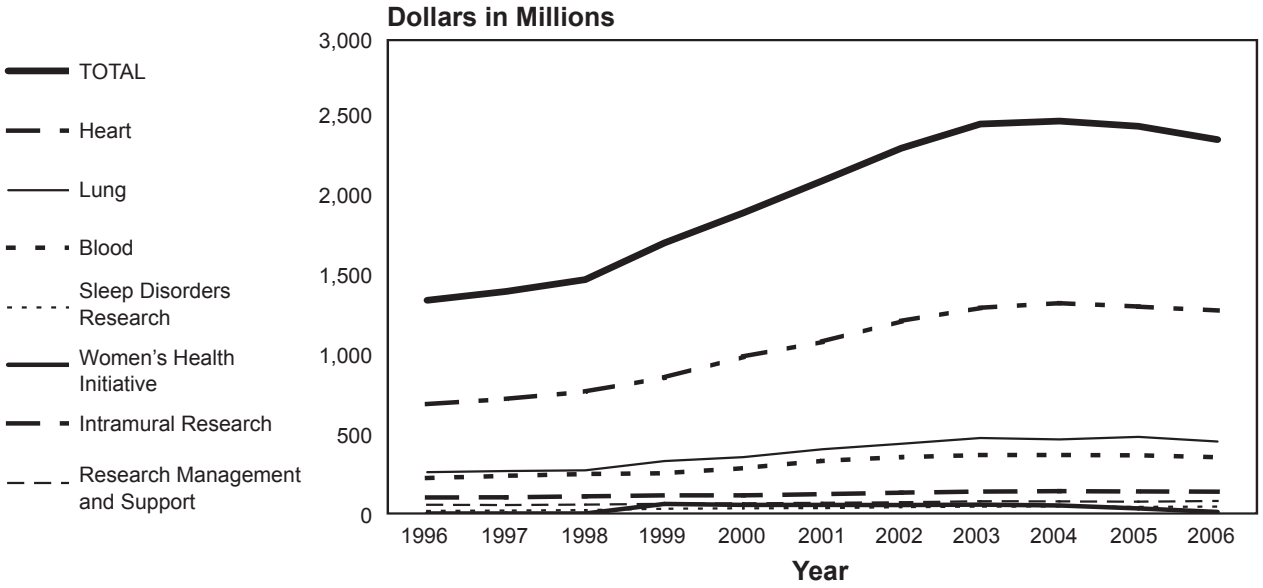
Fiscal Year	Budget Estimate to Congress	House Allowance	Senate Allowance	Appropriation	Obligations	Cumulative Fiscal Year Obligations
1950	$ 34,630	$ 11,575	$ 29,117	$ 16,075	$ 15,768	$ 15,768
1951	8,800	8,800	9,400	9,400	8,497	24,265
1952	10,237	10,074	10,156	10,083	9,850	34,115
1953	9,779	9,623	12,000	12,000	11,398	45,513
1954	11,040	12,000	15,418	15,168	14,952	60,465
1955	14,570	16,168	17,168	16,668	16,595	77,060
1956	17,454	17,398	23,976	18,808	18,838	95,898
1957	22,106	25,106	33,396	33,396	32,392	128,290
1958	33,436	33,436	38,784	35,936	35,973	164,263
1959	34,820	36,212	49,529	45,613	45,468	209,731
1960	45,594	52,744	89,500	62,237	61,565	271,296
1961	63,162	71,762	125,166	86,900	86,239	357,535
1962	97,073	105,723	160,000	132,912	110,849	468,384
1963	126,898	143,398	149,498	147,398	120,597	588,981
1964	130,108	129,325	130,545	132,404	117,551	706,532
1965	125,640	124,521	125,171	124,824	124,412	830,944
1966	141,412	146,212	143,462	141,462	141,171	972,115
1967	148,407	154,770	164,770	164,770	164,342	1,136,457
1968	167,954	167,954	177,954	167,954	162,134	1,298,591
1969	169,735	164,120	172,120	166,928	161,834	1,460,425
1970	160,513	160,513	182,000	171,257	160,433	1,620,858
1971	171,747	178,479	203,479	194,901	194,826	1,815,684
1972	195,492	211,624	252,590	232,627	232,577	2,048,261
1973	255,280	300,000	350,000	300,000	255,722	2,303,983
1974	265,000	281,415	320,000	302,915	327,270	2,631,253
1975	309,299	321,196	330,000	327,996	327,953	2,959,206
1976	324,934	329,079	379,059	370,096	368,648	3,327,854
TQ[A]	59,715	58,015	58,015	58,763	60,639	3,388,493
1977	342,855	380,661	420,661	396,661	396,857	3,785,350
1978	403,642	432,642	456,000	447,901	447,968	4,233,318
1979	454,336	485,584	485,584	510,134	510,080	4,743,398
1980	507,344	527,544	527,544	527,544	527,248	5,270,646
1981	532,799	560,264	565,264	549,693	550,072	5,820,718
1982	579,602	583,831	587,741	559,637	559,800	6,380,518
1983	577,143	620,947	624,542	624,259	624,260	7,004,778
1984	639,774	665,859	683,489	704,939	705,064	7,709,842
1985	718,852	764,135	807,149	805,269	803,810	8,513,652
1986	775,254	856,388	863,652	859,239	821,901	9,335,553
1987	785,697	921,410	921,502	930,001	929,982	10,265,535
1988	821,887	990,808	1,000,349	965,536	965,283	11,230,818
1989	1,054,503	1,018,983	1,056,003	1,045,985	1,045,508	12,276,326
1990	1,039,846	1,090,930	1,091,597	1,072,354	1,070,683	13,347,009
1991	1,112,502	1,135,589	1,137,235	1,126,942	1,125,915	14,472,924
1992	1,209,924	1,202,398	1,190,396	1,191,500	1,190,070	15,662,994
1993	1,245,396	1,228,455	1,228,455	1,214,693	1,214,693	16,877,687
1994	1,198,402	1,277,880	1,277,880	1,277,880	1,277,852	18,155,539
1995	1,266,961	1,259,590	1,259,590	1,258,472	1,314,969	19,470,508
1996	1,337,021	1,355,866	1,320,254[B]	1,355,866	1,351,422[C]	20,821,930
1997	1,320,555[D]	1,438,265	1,344,742[D]	1,432,529[E]	1,431,821	22,253,751
1998	1,467,189	1,513,004	1,531,898	1,531,061[F]	1,526,276	23,780,027
1999	1,709,328[G]	1,720,344	1,793,697	1,793,697[F]	1,788,008	25,568,035
2000	1,759,806	1,937,404	2,001,185	2,040,291[F]	2,027,286	27,595,321
2001	2,069,582	2,328,102	2,328,105	2,299,866[H]	2,298,035	29,893,356
2002	2,567,429	2,547,675	2,618,966	2,576,125[I]	2,569,794	32,463,150
2003	2,791,411	2,812,011	2,818,684	2,812,011[J]	2,793,681	35,256,831
2004	2,867,995	2,867,995	2,897,595	2,882,715[K]	2,882,601	38,139,432
2005	2,963,953	2,963,953	2,985,900	2,965,453	2,922,573[L]	41,062,005
2006	2,951,270	2,951,270	3,023,381	2,951,270[J]	2,893,527	43,955,532

A TQ=Transition Quarter, July 1–September 30, 1976.
B Senate Allowance reflects the Institute share of the Government-wide rescission and the HHS rescission.
C Obligations reflect the Institute share of the Government-wide rescission, the HHS rescission, and a transfer to other NIH Institutes through the NIH Director's 1 percent transfer authority.
D Excludes funds for AIDS research activities consolidated in the NIH Office of AIDS Research (OAR).
E Excludes enacted administrative reduction.
F Excludes Director transfer, Secretary transfer, and rescission.
G Includes Bioterrorism reduction.
H Excludes Office of Human Research Protection transfer, Secretary transfer, and rescission.
I Excludes Government-wide rescission, Labor/HHS/Education rescission, from HHS to OMB rescission, and Secretary 1 percent transfer.
J Excludes Government-wide rescission.
K Includes Roadmap adjustments.
L Includes Roadmap Transfer and Government-wide rescission.

NHLBI Total Obligations by Budget Category: Fiscal Years 1996–2006
Current Dollars



NHLBI Total Obligations by Budget Category: Fiscal Years 1996–2006
Constant 1996 Dollars



NHLBI Total Obligations by Budget Category: Fiscal Years 1996–2006

Current Dollars (Millions)

	Fiscal Year										
Budget Category	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Extramural Research											
Heart	$ 692.8	$ 737.9	$ 795.6	$ 898.0	$1,058.0	$1,186.6	$1,353.4	$1,475.6	$1,545.9	$1,561.8	$1,570.6
Lung	261.9	273.4	281.7	346.2	380.4	444.0	490.5	541.1	544.1	578.3	556.9
Blood	224.3	242.7	257.5	266.1	305.9	364.0	396.0	419.3	429.2	439.5	434.9
Sleep Disorders Research	15.9	18.7	22.3	31.2	35.1	37.0	44.7	49.4	51.9	49.9	53.4
Women's Health Initiative	—	—	—	63.1	57.7	59.2	59.0	63.2	58.8	37.8	12.1
Intramural Research	101.8	104.4	111.6	119.5	122.3	133.7	146.7	157.8	164.2	166.3	168.3
Research Management and Support	54.8	54.6	57.6	63.9	67.9	73.5	79.4	87.3	88.5	89.0	97.2
Total	**$1,351.5**	**$1,431.7**	**$1,526.3**	**$1,788.0**	**$2,027.3**	**$2,298.0**	**$2,569.8**	**$2,793.7**	**$2,882.6**	**$2,922.6**	**$2,893.4**

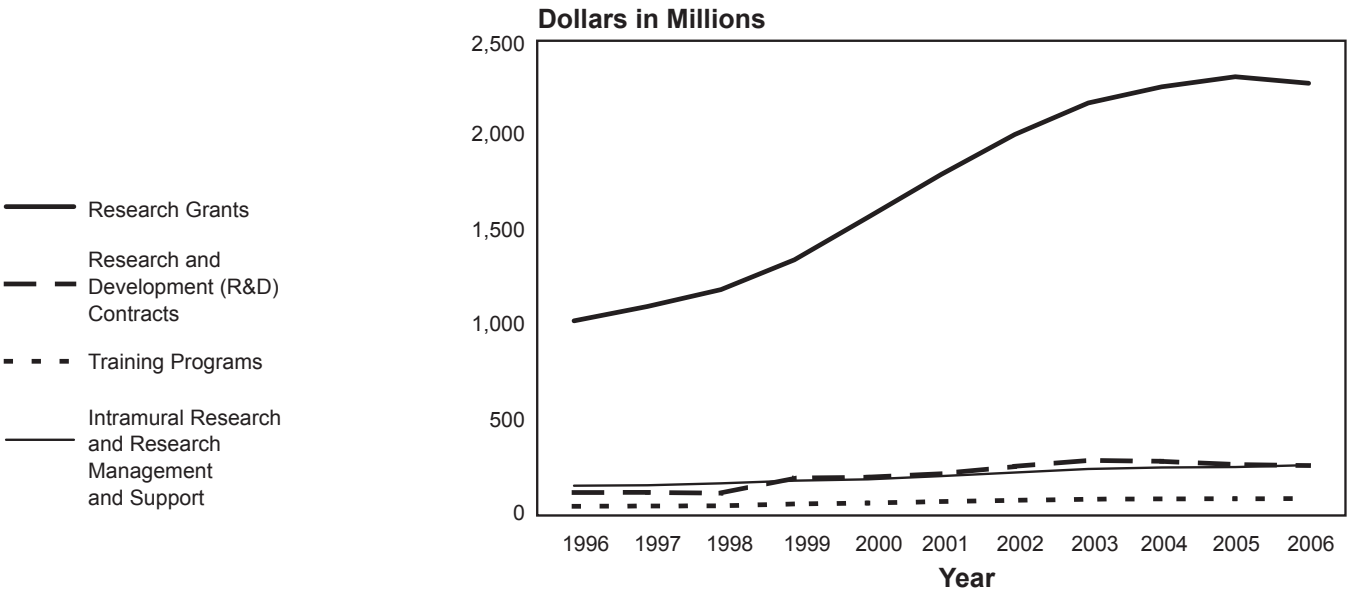
NHLBI Total Obligations by Budget Category: Fiscal Years 1996–2006

Constant 1996 Dollars (Millions)

	Fiscal Year										
Budget Category	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Extramural Research											
Heart	$ 692.8	$ 725.6	$ 772.4	$ 861.0	$ 994.4	$1,088.6	$1,219.3	$1,303.5	$1,333.8	$1,311.3	$1,286.3
Lung	261.9	268.8	273.5	331.9	357.5	407.3	441.9	478.0	469.5	485.6	456.1
Blood	224.3	238.6	250.0	255.1	287.5	333.9	356.8	370.4	370.3	369.0	356.2
Sleep Disorders Research	15.9	18.4	21.7	29.9	33.0	33.9	40.3	43.6	44.8	41.9	43.7
Women's Health Initiative	—	—	—	60.5	54.2	54.3	53.2	55.8	50.7	31.7	9.9
Intramural Research	101.8	102.7	108.3	114.6	114.9	122.7	132.2	139.4	141.7	139.6	137.8
Research Management and Support	54.8	53.7	55.9	61.3	63.8	67.4	71.5	77.1	76.4	74.7	79.6
Total	**$1,351.5**	**$1,407.8**	**$1,481.8**	**$1,714.3**	**$1,905.4**	**$2,108.3**	**$2,315.0**	**$2,467.9**	**$2,487.1**	**$2,453.9**	**$2,369.7**

This table is based on the Biomedical Research & Development Price Index through 2006.

NHLBI Total Obligations by Budget Mechanism: Fiscal Years 1996–2006



NHLBI Total Obligations by Budget Mechanism: Fiscal Years 1996–2006

Current Dollars (Millions)

	Fiscal Year										
Funding Mechanism	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Research Grants*	$1,025.4	$1,100.9	$1,189.8	$1,346.6	$1,570.5	$1,796.9	$2,006.2	$2,172.3	$2,257.3	$2,310.2	$2,275.9
Research and Development (R&D) Contracts	120.9	121.9	116.7	197.2	201.3	220.1	258.3	290.5	285.5	268.6	262.8
Training Programs	48.5	49.8	50.6	60.8	65.4	73.7	79.2	85.8	87.1	88.4	89.2
Intramural Research and Research Management and Support†	156.6	159.1	169.2	183.4	190.1	207.3	226.1	245.1	252.7	255.4	265.6
Total	**$1,351.4**	**$1,431.7**	**$1,526.3**	**$1,788.0**	**$2,027.3**	**$2,298.0**	**$2,569.8**	**$2,793.7**	**$2,882.6**	**$2,922.6**	**$2,893.5**

* Includes Research Career Programs.

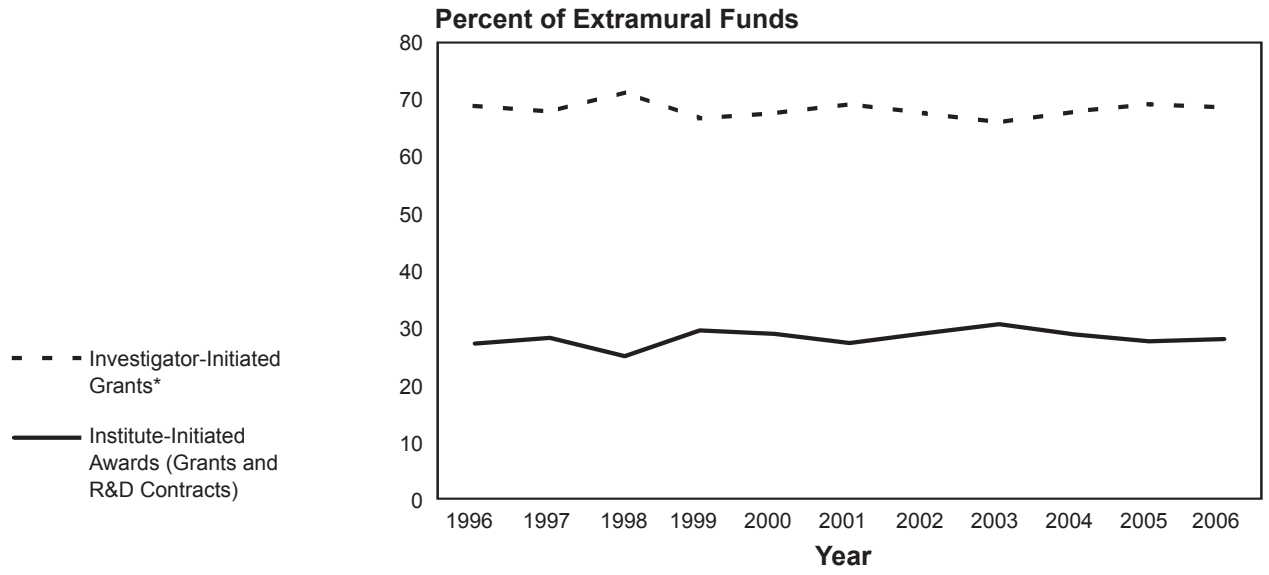
† Excludes Office of the Director and DIR research contracts, which are included in R&D contracts.

NHLBI Employment: Fiscal Years 1996–2006

	Fiscal Year										
Staff	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
FTEs*	834	829	840	847	865	868	880	880	861	796	797

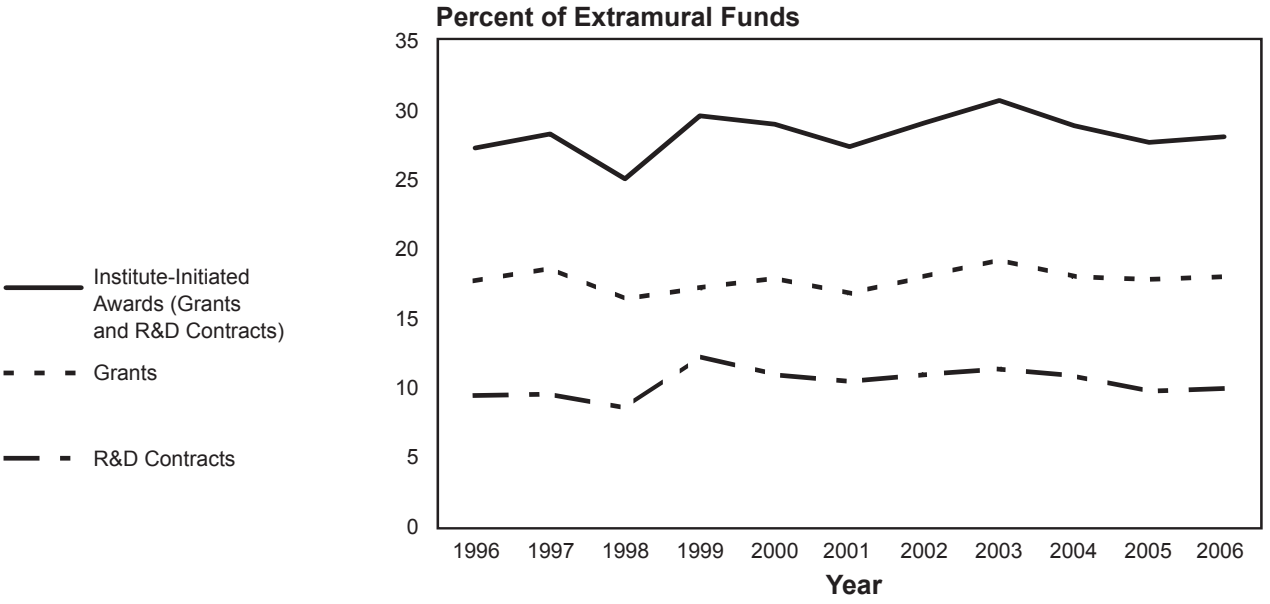
* Full-time equivalents.

NHLBI Institute-Initiated and Investigator-Initiated Awards: Fiscal Years 1996–2006



* Includes Research Career Programs.

NHLBI Grants and Research and Development Contracts as Subsets of Institute-Initiated Awards: Fiscal Years 1996–2006



NHLBI Extramural Programs: Fiscal Years 1996–2006

Dollars (Millions)

	Fiscal Year										
Funding Mechanism	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Investigator-Initiated Awards											
Investigator-Initiated Grants*	$ 779.0	$ 830.3	$ 930.5	$1,022.2	$1,187.4	$1,388.8	$1,521.4	$1,616.1	$1,716.8	$1,747.2	$1,747.0
Research Career Programs	33.8	33.9	36.1	47.7	54.2	57.5	63.5	65.8	67.8	71.0	70.4
Subtotal, Investigator-Initiated Awards	812.8	864.2	966.6	1,069.9	1,241.6	1,446.3	1,584.9	1,681.9	1,784.6	1,818.2	1,817.3
Institute-Initiated Awards											
Institute-Initiated Grants (RFA)	216.8	236.8	223.2	276.7	328.9	350.7	421.3	490.4	472.5	492.1	458.6
Centers†	*106.7*	*108.7*	*114.4*	*119.9*	*123.8*	*127.2*	*128.2*	*138.9*	*140.6*	*151.5*	*141.1*
R&D Contracts (RFP)	116.7	121.9	116.7	197.2	201.3	220.1	258.3	290.5	285.5	268.6	262.9
Subtotal, Institute-Initiated Awards	333.5	358.7	339.9	473.9	530.2	570.8	679.6	780.9	758.0	760.7	721.4
Training											
Individual Awards	7.3	6.8	7.6	9.2	8.9	8.9	9.5	8.6	8.8	9.7	10.0
Institutional Awards	41.2	43.0	43.0	51.6	56.5	64.8	69.7	77.2	78.4	78.7	79.1
Subtotal, Training	48.5	49.8	50.6	60.8	65.4	73.7	79.2	85.8	87.2	88.4	89.2
Total, Extramural	**$1,194.8**	**$1,272.7**	**$1,357.1**	**$1,604.6**	**$1,837.2**	**$2,090.8**	**$2,343.7**	**$2,548.6**	**$2,629.8**	**$2,667.3**	**$2,628.0**

* Includes all R18s.
† Centers are a subset of Institute-Initiated Grants (RFAs), and are not added to the Institute-Initiated Awards subtotal as a distinct category.

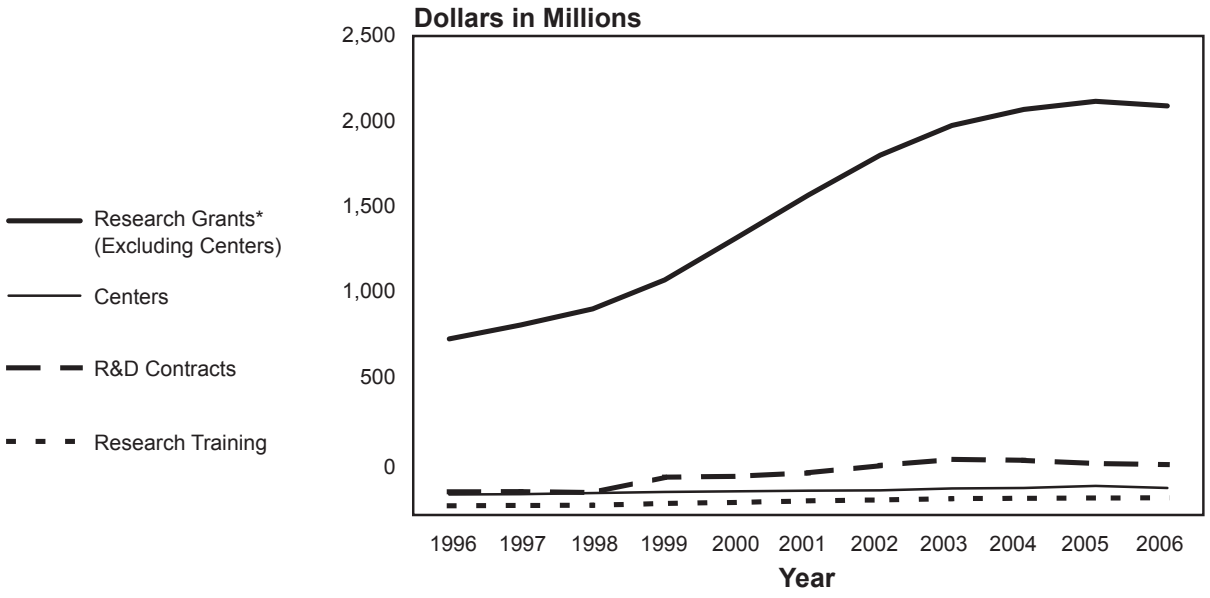
NHLBI Extramural Programs: Fiscal Years 1996–2006

Percent of Total Extramural Budget

	Fiscal Year										
Funding Mechanism	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Investigator-Initiated Awards											
Investigator-Initiated Grants*	65.2%	65.2%	68.6%	63.7%	64.6%	66.4%	64.9%	63.4%	65.3%	65.5%	66.5%
Research Career Programs (K04, K06)	2.8	2.7	2.7	3.0	3.0	2.8	2.7	2.6	2.6	2.7	2.7
Subtotal, Investigator-Initiated Awards	68.0	67.9	71.2	66.7	67.6	69.2	67.6	66.0	67.9	68.2	69.2
Institute-Initiated Awards											
Institute-Initiated Grants (RFA)	18.1	18.6	16.4	17.2	17.9	16.8	18.0	19.2	18.0	18.4	17.5
Centers†	*8.9*	*8.5*	*8.4*	*7.5*	*6.7*	*6.1*	*5.5*	*5.5*	*5.3*	*5.7*	*5.4*
R&D Contracts (RFP)	9.8	9.6	8.6	12.3	11.0	10.5	11.0	11.4	10.9	10.1	10.0
Subtotal, Institute-Initiated Awards	27.9	28.2	25.0	29.5	28.9	27.3	29.0	30.6	28.8	28.5	27.5
Training											
Individual Awards	0.6	0.5	0.6	0.6	0.5	0.4	0.4	0.3	0.3	0.4	0.4
Institutional Awards	3.4	3.4	3.2	3.2	3.1	3.1	3.0	3.0	3.0	3.0	3.0
Subtotal, Training	4.0	3.9	3.7	3.8	3.6	3.5	3.4	3.4	3.3	3.3	3.4
Total, Extramural	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

* Includes all R18s.
† Centers are a subset of Institute-Initiated Grants (RFAs), and are not added to the Institute-Initiated Awards subtotal as a distinct category.

NHLBI Extramural Research Funding Mechanism: Fiscal Years 1996–2006



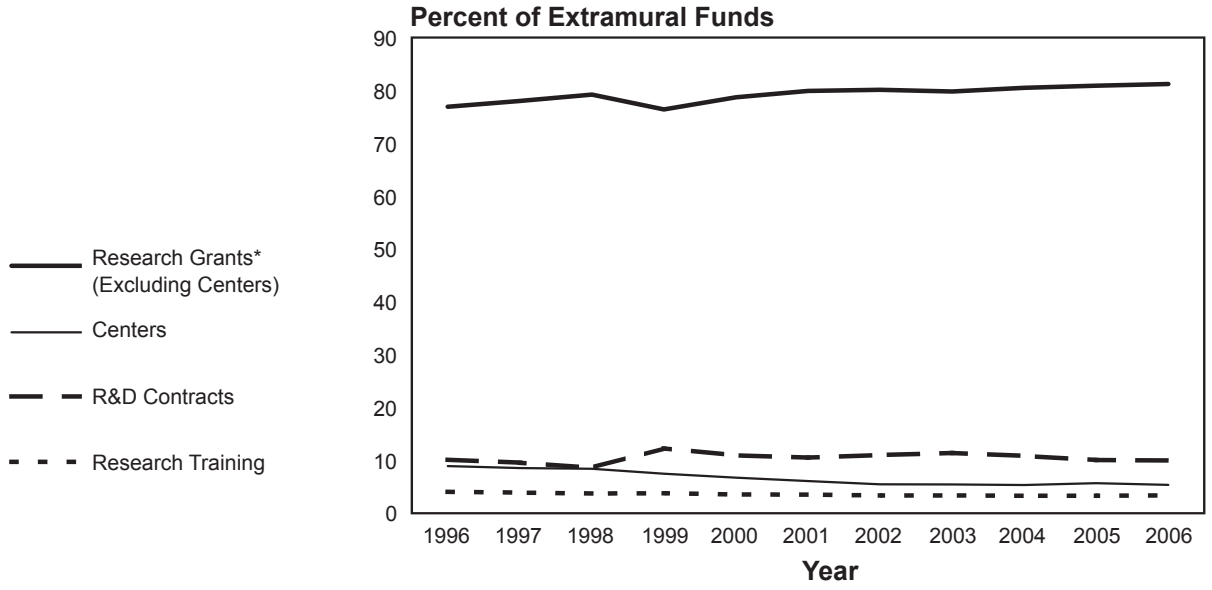
NHLBI Extramural Research Funding Mechanism: Fiscal Years 1996–2006

Dollars (Millions)

	Fiscal Year										
Funding Mechanism	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Research Grants*	$ 918.7	$ 992.3	$1,075.4	$1,226.7	$1,446.7	$1,669.8	$1,878.0	$2,033.4	$2,116.6	$2,158.8	$2,134.9
Centers	106.7	108.7	114.4	119.9	123.8	127.2	128.2	138.9	140.6	151.5	141.1
R&D Contracts	120.9	121.9	116.7	197.2	201.3	220.1	258.3	290.5	285.5	268.6	262.9
Research Training	48.5	49.8	50.6	60.8	65.4	73.7	79.2	85.8	87.1	88.4	89.2
Total, Extramural	**$1,194.8**	**$1,272.7**	**$1,357.1**	**$1,604.6**	**$1,837.2**	**$2,090.8**	**$2,343.7**	**$2,548.6**	**$2,629.8**	**$2,667.3**	**$2,628.0**

* Includes Research Career Programs; does not include Centers.

NHLBI Extramural Research Funding Mechanism: Fiscal Years 1996–2006



NHLBI Extramural Research Funding Mechanism: Fiscal Years 1996–2006

	Percent of Total Extramural Budget										
	Fiscal Year										
Funding Mechanism	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Research Grants*	76.9%	78.0%	79.2%	76.4%	78.7%	79.9%	80.1%	79.8%	80.5%	80.9%	81.2%
Centers	8.9	8.5	8.4	7.5	6.7	6.1	5.5	5.5	5.3	5.7	5.4
R&D Contracts (RFP)	10.1	9.6	8.6	12.3	11.0	10.5	11.0	11.4	10.9	10.1	10.0
Research Training	4.1	3.9	3.7	3.8	3.6	3.5	3.4	3.4	3.3	3.3	3.4
Total, Extramural	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

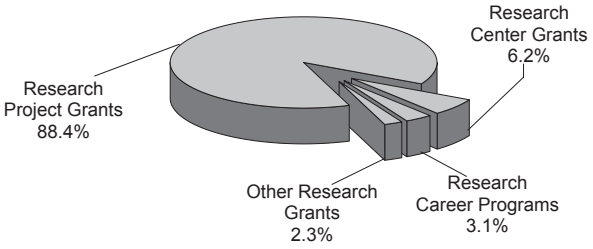
* Includes Research Career Programs; does not include Centers.
Note: Numbers may not add to total due to rounding.

9. Research Grants

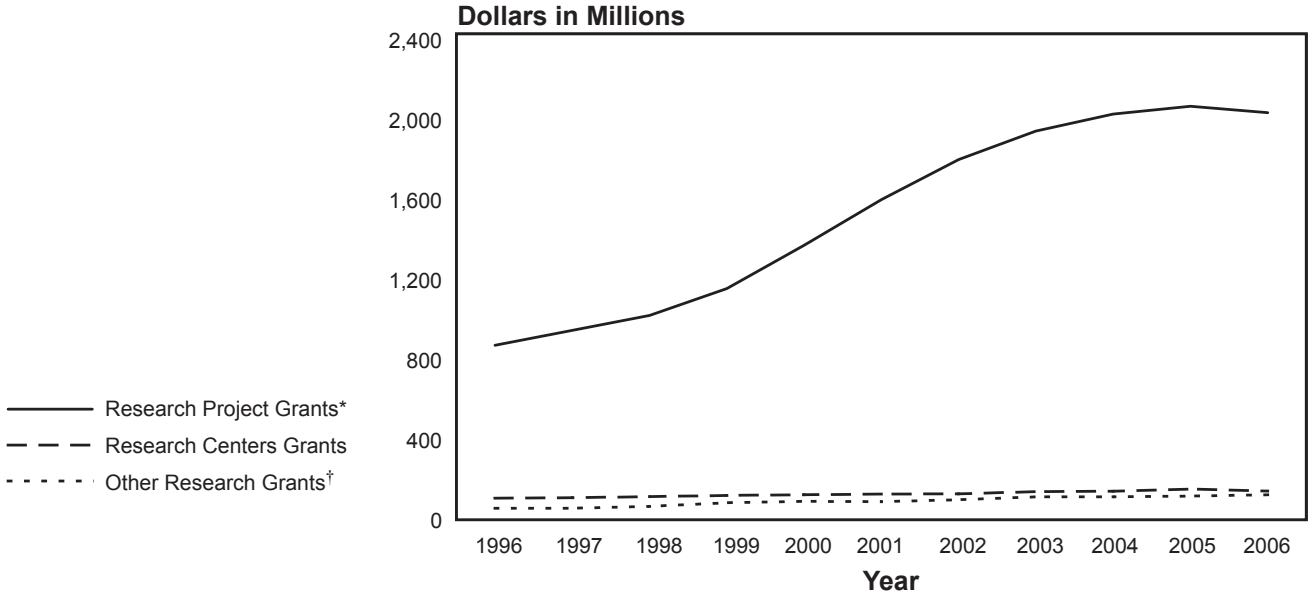
NHLBI Research Grants by Funding Mechanism: Fiscal Year 2006

	Number of Grants	Total Cost (Dollars in Thousands)	Percent of Total NHLBI Research Grant Dollars
Research Project Grants (RPGs)			
Research Project Grants (Excluding Small Business RPGs)			
Regular Research Grants (R01)	3,281	$1,322,778	58.12%
Small Research Grants (R03)	1	33	0.00
Program Project Grants (P01)	179	357,269	15.70
Cooperative Agreements (U01)	231	200,727	8.82
Area Grants (R15)	12	2,531	0.11
Explorative Developmental Grant (R21)	112	21,177	0.93
Method To Extend Research in Time (R37)	77	31,128	1.37
NIH Director's Pioneer Award (DP1)	0	312	0.01
Exploratory/Developmental Grants Phase II (R33)	7	2,634	0.12
Subtotal, Research Project Grants (Excluding Small Business RPGs)	3,900	1,938,589	85.17
Small Business Research Project Grants			
Small Business Technology Transfer (STTR Phase I) (R41)	21	3,059	0.13
Small Business Technology Transfer (STTR Phase II) (R42)	12	4,837	0.21
Small Business Innovation Research (SBIR Phase I) (R43)	54	9,237	0.41
Small Business Innovation Research (SBIR Phase II) (R44)	94	55,327	2.43
Subtotal, Small Business Research Project Grants	181	72,460	3.18
Subtotal, Research Project Grants	4,081	2,011,049	88.36
Research Center Grants			
Specialized Centers and Centers of Excellence (P50)	41	104,375	4.59
Sickle Cell Centers (U54)	11	23,928	1.05
Center for AIDS Research (P30)	0	2,961	0.13
Specialized Centers (Cooperative Agreements) (U54)	5	9,057	0.40
National Swine Research and Resource Center (U42)	1	765	0.03
Subtotal, Research Center Grants	58	141,086	6.20
Research Career Programs			
Mentored Research Development Award for Minority Faculty (K01)	40	5,453	0.24
Minority Institution Faculty Mentored Research Scientist Award (K01)	4	567	0.02
Mentored Scientist Development Award in Research Ethics (K01)	3	358	0.02
Independent Scientist Award (K02)	24	2,421	0.11
Research Career Award (K06)	1	34	0.00
Cultural Competence and Health Disparities Academic Award (K07)	18	2,109	0.09
Clinical Investigator Scientist Award (K08)	226	28,973	1.27
Vascular Medicine Research Career Development Program (K12)	2	772	0.03
Clinical Hematology Research Career Development Program (K12)	6	2,360	0.10
Career Enhancement Award for Stem Cell Research (K18)	2	213	0.01
Career Transition Award (K22)	1	178	0.01
Mentored Patient-Oriented Research Career Development Award (K23)	122	16,720	0.73
Midcareer Investigator Award in Patient-Oriented Research (K24)	33	4,315	0.19
Mentored Quantitative Research Career Development Award (K25)	16	2,184	0.10
Clinical Research Curriculum Award (K30)	14	3,708	0.16
Subtotal, Research Career Programs	512	70,365	3.10
Other Research Grants			
Cooperative Clinical Research (U10, R10)	47	33,684	1.48
Minority Biomedical Research Support (S06, S14, R25)	0	2,032	0.09
Other (R09, R13, R18, R24, R25, T15, U09, U24, UH1)	83	17,721	0.78
Subtotal, Other Research Grants	130	53,437	2.35
Total, NHLBI Research Grants	**4,781**	**$2,275,937**	**100%**

NHLBI Total Research Grants by Category



NHLBI Research Project Grant,* Research Centers Grant, and Other Research Grant Obligations: Fiscal Years 1996–2006



NHLBI Research Project Grant,* Research Centers Grant, and Other Research Grant Obligations: Fiscal Years 1996–2006

Dollars (Thousands)

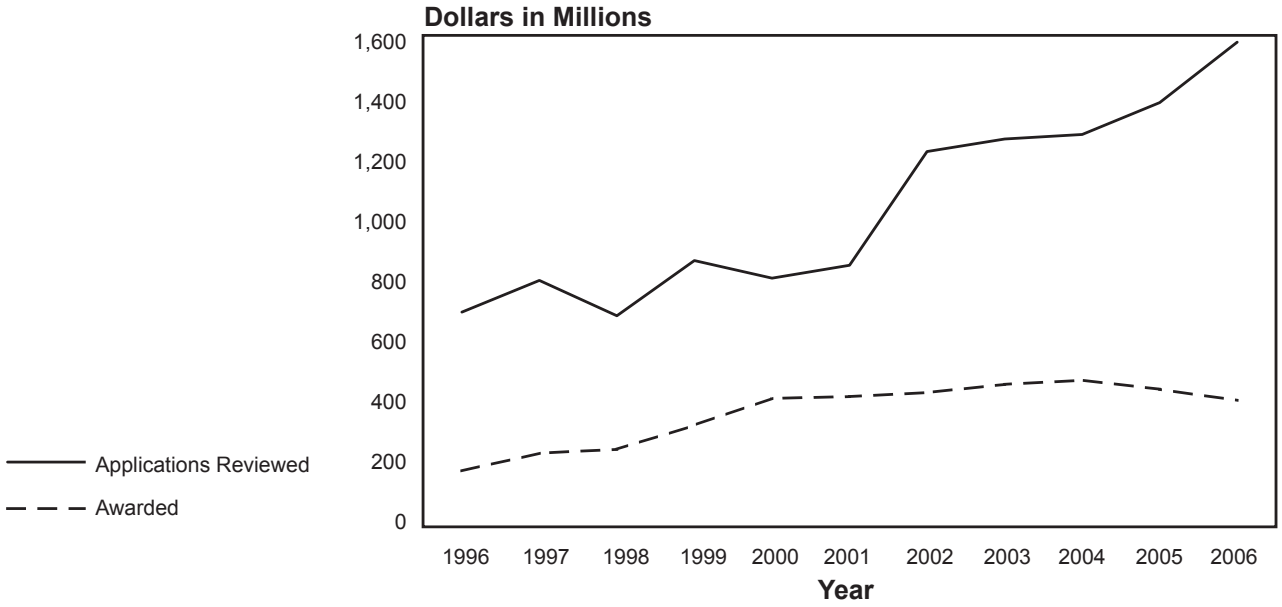
	Fiscal Year										
	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Research Project Grants*	$ 862,027	$ 935,322	$1,009,152	$1,142,473	$1,356,034	$1,580,751	$1,779,573	$1,920,201	$2,003,769	$2,042,050	$2,011,049
Research Centers Grants	106,688	108,665	114,397	119,889	123,803	127,232	128,161	138,941	140,600	151,495	141,086
Other Research Grants†	56,692	56,993	66,234	84,219	90,666	88,958	98,460	113,172	112,785	116,713	123,802
Total	**$1,025,407‡**	**$1,100,980**	**$1,189,783**	**$1,346,581**	**$1,570,503**	**$1,796,941**	**$2,006,194**	**$2,172,314**	**$2,257,154**	**$2,310,258**	**$2,275,937**

* Includes R01, U01, P01, R03, R15, R29, R37, R41, R42, R43, and R44; R55 in 1996; R21 beginning in 1997; and R33 beginning in 2001.

† Includes Research Career Programs; excludes General Research Support Grants.

‡ Includes Program Evaluation and IMPAC II Assessment of $4,435,000.

NHLBI Competing Research Project Grant Applications*: Fiscal Years 1996–2006
Total Cost Dollars Reviewed and Awarded



NHLBI Competing Research Project Grant Applications*: Fiscal Years 1996–2006
Total Cost Dollars Reviewed and Awarded

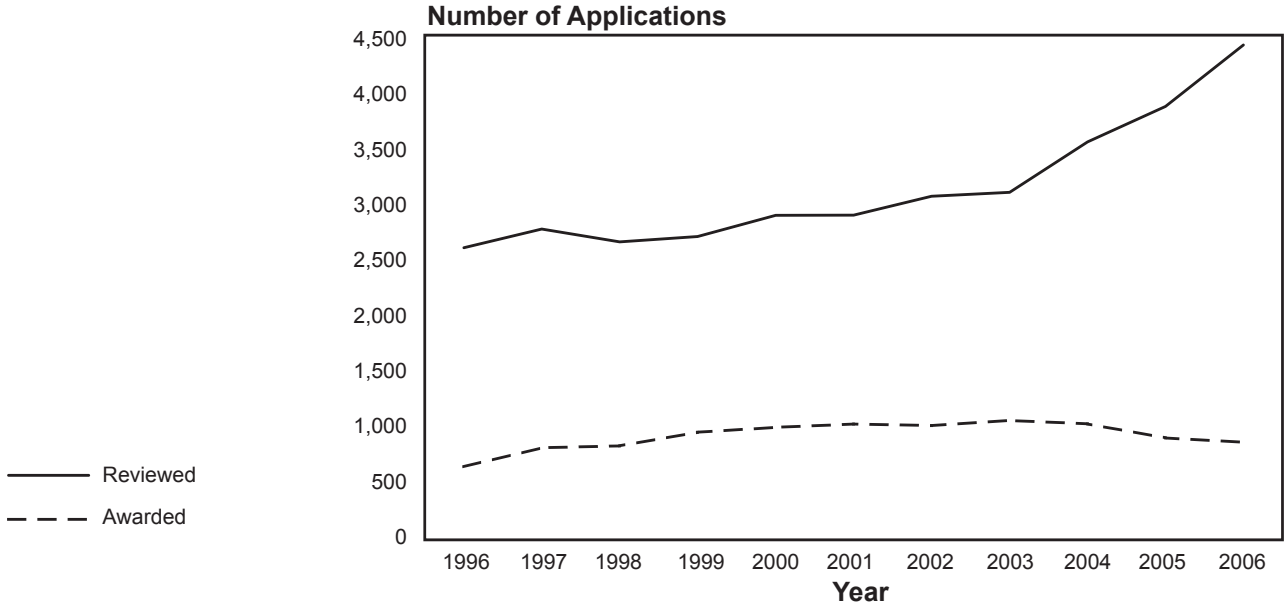
Dollars (Millions)

	Fiscal Year										
	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Applications Reviewed	$699.2	$802.1	$687.1	$867.1	$809.8	$851.7	$1,221.7	$1,262.5	$1,277.6	$1,381.0	$1,577.7
Awarded	182.1	240.1	252.4	330.4	418.4	424.3	437.4	463.7	477.3	447.8	411.6

* Includes R01, U01, P01, R03, R15, R29, R37, R41, R42, R43, and R44; R55 in 1996; R21 beginning in 1997; and R33 beginning in 2001.

NHLBI Competing Research Project Grant Applications*: Fiscal Years 1996–2006

Number Reviewed and Awarded

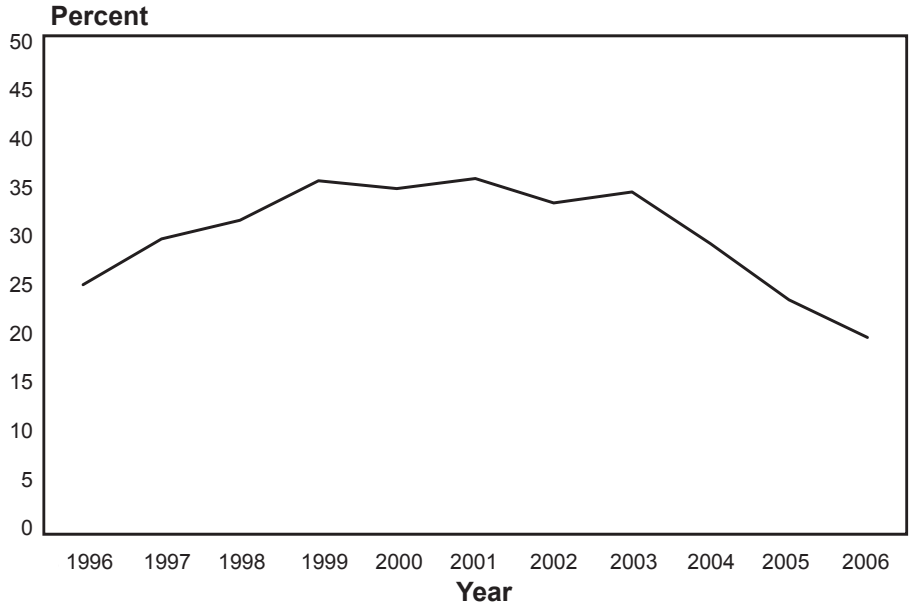


Number Reviewed and Awarded and Percent Funded

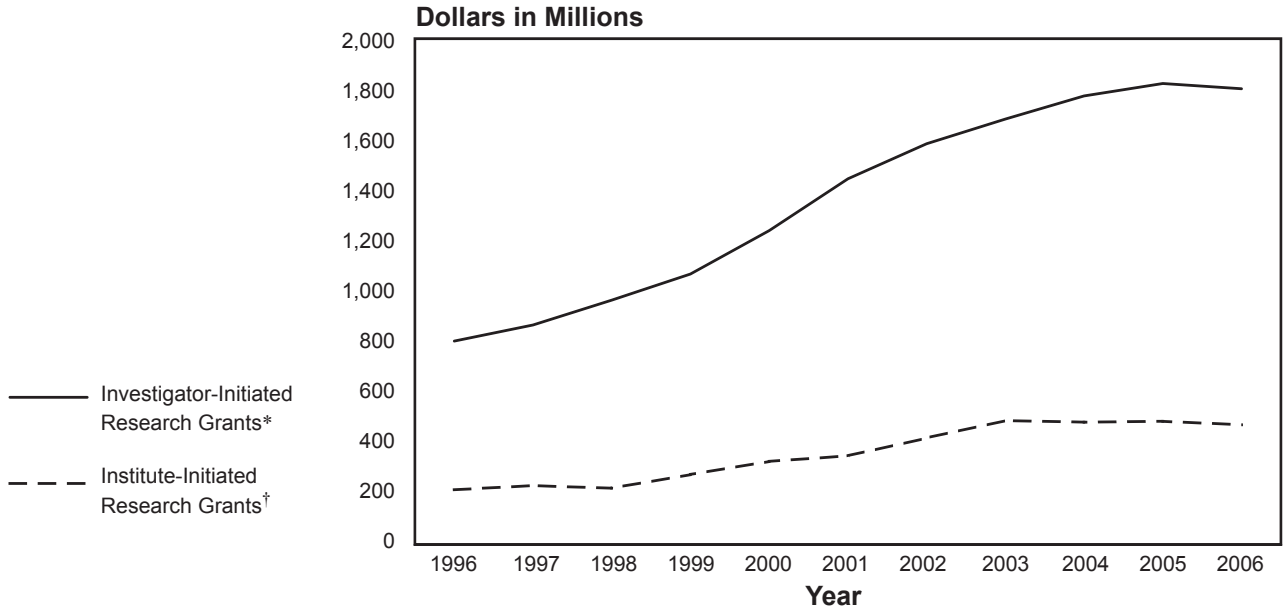
	Fiscal Year										
	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Applications Reviewed	2,605	2,771	2,657	2,704	2,893	2,895	3,064	3,098	3,548	3,865	4,412
RPGs Awarded	652	821	837	959	1,003	1,033	1,018	1,064	1,034	909	871
Success Rate (percent)	25.0	29.6	31.5	35.5	34.7	35.7	33.2	34.3	29.1	23.5	19.7

* Includes R01, U01, P01, R03, R15, R29, R37, R41, R42, R43, and R44; R55 in 1996; R21 beginning in 1997; and R33 beginning in 2001.

Percent of Reviewed Applications Funded (Success Rate)



NHLBI Investigator-Initiated and Institute-Initiated Grant Obligations: Fiscal Years 1996–2006



NHLBI Investigator-Initiated and Institute-Initiated Grant Obligations: Fiscal Years 1996–2006

Dollars (Millions)

	Fiscal Year										
	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Investigator-Initiated*	$ 804.1	$ 867.9	$ 966.6	$1,069.9	$1,241.6	$1,446.2	$1,584.9	$1,681.9	$1,773.4	$1,822.9	$1,802.1
Institute-Initiated†	216.8	233.0	223.2	276.7	328.9	350.7	421.3	490.4	483.8	487.3	473.8
Total	**$1,020.9‡**	**$1,100.9**	**$1,189.8**	**$1,346.6**	**$1,570.5**	**$1,796.9**	**$2,006.2**	**$2,172.3**	**$2,257.2**	**$2,310.2**	**$2,275.9**

* Includes R01, U01, P01, R03, R15, R29, R37, R41, R42, R43, and R44; R55 in 1996; R21 beginning in 1997; and R33 beginning in 2001.

† Includes Centers Grants and Cooperative Agreement RFAs.

‡ Excludes Program Evaluation Assessment of $4,435,000.

NHLBI Research Project Grants*: Amount Funded by Type of Award, Fiscal Years 1996–2006

Dollars (Millions)

	Fiscal Year										
	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Competing											
New Competing	$ 90.5	$135.8	$147.5	$ 202.0	$ 266.4	$ 280.0	$ 291.2	$ 285.5	$ 290.5	$ 270.0	$ 242.9
Renewal Competing	90.4	104	103.9	127.2	152	143.9	143.9	177.2	185.5	176.1	168.3
Competing Supplements	1.2	0.3	1	1.2	0.9	0.4	2.3	1	1.3	1.7	0.4
Subtotal, Competing	182.1	240.1	252.4	330.4	419.3	424.3	437.4	463.7	477.3	447.8	411.6
Noncompeting											
Subtotal, Noncompeting	649.9	662.4	721.3	770.6	889.3	1,101.5	2,218.3	1,390.3	1,454.9	1,520.0	1,527.0
Total, Competing and Noncompeting	**$832.0**	**$902.5**	**$973.7**	**$1,101.0**	**$1,308.6**	**$1,525.8**	**$1,718.7**	**$1,854.0**	**$1,932.2**	**$1,967.8**	**$1,938.6**

* Includes R01, U01, P01, R03, R15, R29, R37, R41, R42, R43, and R44; R55 in 1996; R21 beginning in 1997; and R33 beginning in 2001.

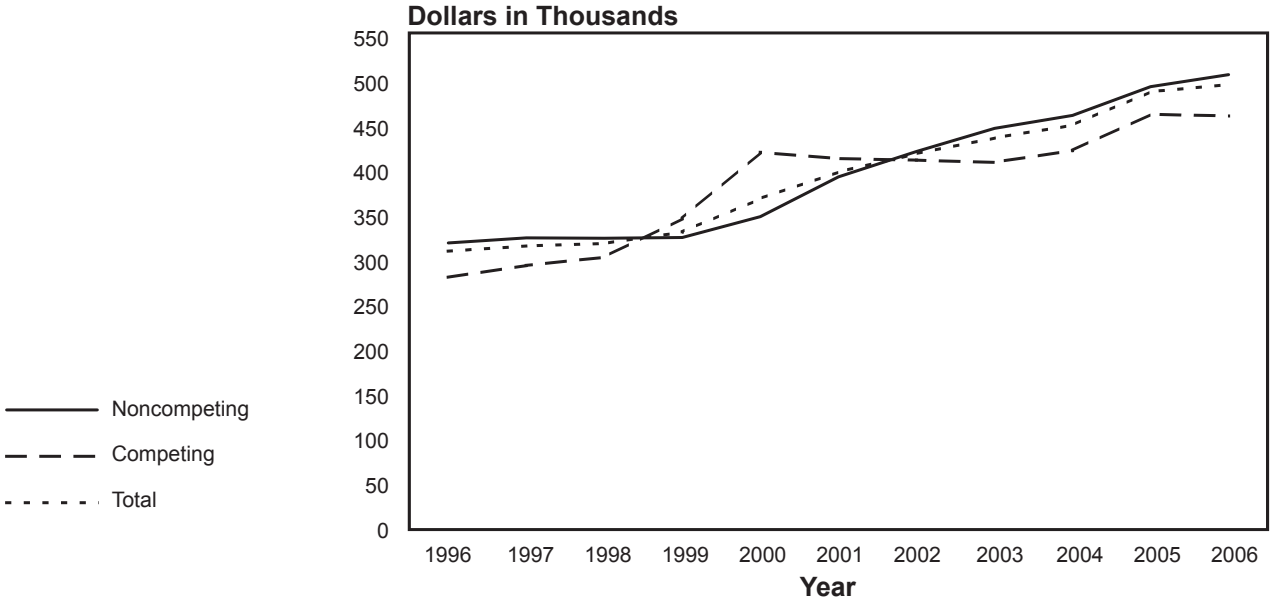
Facility and Administrative (F&A)* Costs of NHLBI Research Project Grants†: Fiscal Years 1996–2006

Dollars (Thousands)

Fiscal Year	Direct Cost	F&A Cost	Total Cost	F&A Cost as a Percent of Direct Cost
1996	$ 564,219	$267,785	$ 832,004	47.5%
1997	611,576	290,915	902,491	47.6
1998	660,009	313,765	973,774	47.5
1999	764,198	336,756‡	1,100,954	44.1
2000	891,244	417,312	1,308,556	46.8
2001	1,045,144	480,673	1,525,817	46.0
2002	1,182,408	536,324	1,718,732	45.4
2003	1,276,819	577,131	1,853,950	45.2
2004	1,329,106	603,133	1,932,239	45.4
2005	1,355,803	612,007	1,967,810	45.1
2006	1,334,406	604,183	1,938,589	45.3

* Previously called Indirect Cost.
† Includes R01, U01, P01, R03, R15, R29, R37, R41, R42, R43, and R44; R55 in 1996; R21 beginning in 1997; and R33 beginning in 2001.
‡ Excludes Program Evaluation Assessment of $1,216,000.

NHLBI Research Project Grants*: Average Costs, Fiscal Years 1996–2006



NHLBI Research Project Grants*: Average Costs, Fiscal Years 1996–2006

Dollars (Thousands)

	Fiscal Year										
	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Noncompeting	$317.5	$323.0	$322.6	$323.4	$346.6	$390.7	$418.8	$444.4	$458.7	$490.6	$503.9
Competing	279.3	292.5	301.6	344.5	418	410.8	409.1	406.7	419.7	459.9	458.1
Total	**$308.3**	**$314.2**	**$316.9**	**$329.4**	**$366.6**	**$396.1**	**$416.2**	**$433.8**	**$447.9**	**$484.8**	**$492.8**

* Includes R01, U01, P01, R03, R15, R29, R37, R41, R42, R43, and R44; R55 in 1996; R21 beginning in 1997; and R33 beginning in 2001.

NHLBI Cooperative Agreements (U01, U10) Programs

Cooperative Agreements were instituted to support discrete, circumscribed projects in areas of an investigator's specific interest and competency with substantial programmatic participation by the NHLBI during performance of the activity.

	Total Obligations Prior to FY 2006	Total FY 2006 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
AIM HIGH: Niacin Plus Statin To Prevent Vascular Events	$ 663,376	$ 6,323,911	$ 6,987,287
Atherosclerosis, Plaque, and CVD in Communities	9,930,706	3,328,404	13,259,110
Bypass Angioplasty Revascularization Investigation in Type 2 Diabetics (BARI 2D)	43,858,208	8,591,820	52,450,028
Cardiovascular Heart Study (CHS) Events Follow-Up Study	1,007,645	1,055,034	2,062,679
Cardiovascular Outcomes in Renal Atherosclerotic Lesions (CORAL)	9,953,424	4,884,074	14,837,498
Claudication Exercise vs. Edoluminal Revascularization	1,368,413	1,478,581	2,846,994
Clinical Research Consortium To Improve Resuscitation Outcomes	16,224,715	9,183,943	25,408,658
Dynamic Evaluation of Percutaneous Coronary Intervention	5,455,365	725,054	6,180,419
Family Blood Pressure Program	88,494,060	4,732,732	93,226,792
Genetics of Coronary Artery Disease in Alaskan Natives (GOCADAN)	9,792,055	2,046,285	11,838,340
Girls Health Enrichment Multisite Studies (GEMS)	17,468,009	1,950,186	19,418,195
Heart Failure: A Controlled Trial Investigating Outcomes of Exercise Training (HF-ACTION)	29,527,693	4,590,429	34,118,122
Heart Failure Clinical Research Network	—	5,642,461	5,642,461
Home Automatic External Defibrillator Trial (HAT)	15,064,384	2,114,588	17,178,972
IMMEDIATE Trial: Immediate Myocardial Metabolic Enhancement During Initial Assessment and Treatment in Emergency Care	14,684,147	10,966,492	25,650,639
Interaction of Genes and Environment in Shaping Risk Factors for Heart, Lung, and Blood Diseases and Sleep Disorders	46,072,888	640,556	46,713,444
NHLBI Clinical Proteomics Program	5,103,660	4,920,669	10,024,329
Partnership Programs for Reducing Cardiovascular Health Disparities	13,670,752	7,258,374	20,929,126
Pediatric Heart Network	—	6,988,223	6,988,223
Pharmacogenetics Research Network	39,541,200	8,983,384	48,524,584
Preventing Overweight Using Novel Dietary Strategies (POUNDS LOST)	4,916,790	1,863,033	6,779,823
Primordial Prevention of Overweight in American Indian Children	354,427	2,083,097	2,437,524
Programs of Excellence in Nanotechnology	6,322,873	11,230,687	17,553,560
Programs of Genomic Applications (PGAs) for Heart, Lung, and Blood Diseases	180,640,497	14,467,114	195,107,611
Stop Atherosclerosis in Native Diabetics Study (SANDS)	9,004,979	2,074,057	11,079,036
Strong Heart Study	51,738,304	6,235,839	57,974,143
Surgical Treatment for Ischemic Heart Failure (STICH)	19,946,837	5,583,045	25,529,882
Trial of Activity for Adolescent Girls (TAAG)	33,305,766	905,336	34,211,102
Weight Loss in Obese Adults With Cardiovascular Risk Factors: Clinical Interventions	—	2,567,146	2,567,146
Weight Loss Maintenance (WLM)	11,153,382	4,014,660	15,168,042
Subtotal, Heart and Vascular Diseases	685,264,555	147,429,214	825,705,546
Lung Diseases			
Asthma Clinical Research Network (ACRN), Phase II	25,272,584	7,838,310	33,110,894
Centers for Reducing Asthma Disparities	22,404,795	4,946,024	27,350,819
Childhood Asthma Management Program-Continuation Study (CAMP-CS)/Phase 2	6,155,523	2,750,045	8,905,568
Childhood Asthma Research and Education (CARE) Network	37,102,539	5,734,754	42,837,293
Clinical Trial of Acid Reflux Therapy in Asthma	2,310,686	772,866	3,083,552
Collaborative Programs in Bronchopulmonary Dysplasia	31,656,005	5,075,067	36,731,072
COPD Clinical Research Network	22,129,545	7,664,383	29,793,928
Early Antipseudomonal Therapy in Cystic Fibrosis	2,111,618	1,033,655	3,145,273

	Total Obligations Prior to FY 2006	Total FY 2006 Obligations	Total Obligations to Date
Idiopathic Pulmonary Fibrosis Clinical Research Network	3,486,226	7,349,196	10,835,422
Pharmacogenetics of Asthma Treatment	14,209,020	3,285,718	17,494,738
Prospective Investigation of Pulmonary Embolism Diagnosis III (PIOPED III)	2,301,770	4,341,911	6,643,681
Study of Acid Reflux Therapy for Children With Asthma	—	774,454	774,454
Subtotal, Lung Diseases	169,140,311	51,566,383	219,932,240
Blood Diseases and Resources			
Blood and Marrow Transplant Clinical Research Network	29,641,551	6,845,170	36,486,721
Center for Human Cell Therapy	5,179,743	2,101,631	7,281,374
Functional Outcomes in Cardiovascular Patients Undergoing Surgical Hip Fracture Repair (FOCUS)	6,357,932	2,446,287	8,804,219
Sickle Cell Disease Clinical Research Network	—	3,761,385	3,761,385
Stroke With Transfusions Changing to Hydroxyurea (SWITCH)	3,345,345	3,931,995	7,277,340
Thalassemia (Cooley's Anemia) Clinical Research Network	14,104,677	2,682,493	16,787,170
Transfusion Medicine/Hemostasis Clinical Research Network	24,607,616	6,520,638	31,128,254
Subtotal, Blood Diseases and Resources	83,236,864	28,289,599	111,526,463
National Center on Sleep Disorders Research			
Apnea Positive Pressure Long-Term Efficacy Study (APPLES)	12,542,181	—	12,542,181
Randomized Controlled Study of Adenotonsillectomy for Childhood Sleep Apnea	—	2,267,140	2,267,140
Sleep Heart Health Study	19,603,693	907,548	20,511,241
Subtotal, National Center on Sleep Disorders Research	32,145,874	3,174,688	35,320,562
Total, NHLBI Cooperative Agreements	**$969,787,604**	**$230,459,884**	**$1,192,484,811**

Heart and Vascular Diseases Program

AIM HIGH: Niacin Plus Statin To Prevent Vascular Events, Initiated in Fiscal Year 2005

The purpose of this multicenter clinical trial is to determine whether extended-release niacin plus simvastatin is superior to simvastatin alone for preventing or delaying a major CVD event in patients with atherogenic dyslipidemia. Niacin is used to raise HDL ("good") cholesterol and simvastatin is used to lower LDL ("bad") cholesterol. Twenty-seven percent of the population will be black.

Obligations

Funding History:
Fiscal Year 2006—$6,323,911
Fiscal Year 2005—$663,376
Total Funding to Date—$6,987,287

Current Active Organizations and Grant Numbers

1. University of Washington
   Seattle, Washington —HL-081616
2. AXIO Research, LLC
   Seattle, Washington —HL-081649

Atherosclerosis, Plaque, and CVD in Communities, Initiated in Fiscal Year 2004

The purpose of this study is to identify correlates of atherosclerotic plaque characteristics and early changes in the vascular wall in a subset of the biethnic Atherosclerosis Risk in Communities (ARIC) cohort. Investigators will use stored DNA samples to test genomic correlates of plaque characteristics and their ability to predict CHD and stroke.

Obligations

Funding History:
Fiscal Year 2006—$3,328,404
Fiscal Year 2004–2005—$9,930,706
Total Funding to Date—$13,259,110

Current Active Organization and Grant Number

1. University of Texas Health Science Center
   Houston, Texas —HL-075572

Bypass Angioplasty Revascularization Investigation in Type 2 Diabetics (BARI 2D), Initiated in Fiscal Year 2000

The purpose of this trial is to compare alternative treatment strategies for managing Type 2 diabetic patients with angiographically proven coronary artery disease and stable angina or ischemia. Revascularization combined with aggressive medical anti-ischemia treatment will be compared to aggressive medical anti-ischemia treatment alone; simultaneously, researchers will determine whether insulin-sensitizing drugs like metformin and the glitazones for controlling blood sugar level offer any survival advantage over drugs that increase insulin level. Twenty percent of the patients are from minority populations.

Obligations

Funding History:
Fiscal Year 2006—$8,591,820
Fiscal Years 2000–2005—$43,854,208
Total Funding to Date—$52,450,028

Current Active Organizations and Grant Numbers

1. University of Pittsburgh
   Pittsburgh, Pennsylvania —HL-061744
2. St. Louis University
   St. Louis, Missouri —HL-061746
3. Stanford University
   Stanford, California —HL-061748
4. University of Vermont
   Burlington, Vermont —HL-063804

Cardiovascular Heart Study (CHS) Events Follow-Up Study, Initiated in Fiscal Year 2005

The purpose of this project is to continue follow-up of the CHS cohort for cardiovascular events in order to enhance power among subgroups to study associations of CVD risk factors and incidence and prognosis following CVD events in older adults. The additional events will permit greater opportunity to address the study aims by CHS investigators and other researchers interested in making use of the study's extensive database and specimens. Seventeen percent of the participants are from minority populations.

Obligations

Funding History:
Fiscal Year 2006—$1,055,034
Fiscal Year 2005—$1,007,645
Total Funding to Date—$2,062,679

Current Active Organization and Grant Number

1. University of Washington
   Seattle, Washington —HL-080295

Cardiovascular Outcomes in Renal Atherosclerotic Lesions (CORAL), Initiated in Fiscal Year 2004

The purpose of this trial is to determine whether revascularization of a stenotic renal artery plus medical therapy is associated with improved clinical outcomes compared with medical therapy alone. Thirty percent of the participants will be black.

Obligations

Funding History:
Fiscal Year 2006—$4,884,074
Fiscal Year 2004–2005—$9,953,424
Total Funding to Date—$14,837,498

Current Active Organizations and Grant Numbers

1. Medical University of Ohio
   Toledo, Ohio —HL-071556
2. University of Minnesota, Twin Cities
   Minneapolis, Minnesota —HL-072734
3. University of Virginia
   Charlottesville, Virginia —HL-072735
4. Beth Israel Deaconess Medical Center
   Boston, Massachusetts —HL-072736
5. Brigham and Women's Hospital
   Boston, Massachusetts —HL-072737

Claudication Exercise vs. Edoluminal Revascularization, Initiated in Fiscal Year 2005

The purpose of this study is to test the hypothesis that a strategy of aortoiliac stenting and pharmacotherapy improves maximum walking duration better than a strategy of supervised rehabilitation, exercise, and pharmacotherapy for those with aortoiliac artery obstruction at 6 months. Other objectives are to compare the two treatment groups with a third group, usual care and pharmacotherapy, at 6 months, and to compare maximum walking duration change scores at 18 months, changes in free living daily activity levels, and patient-perceived quality of life among all three groups.

Obligations

Funding History:
Fiscal Year 2006—$1,478,581
Fiscal Year 2005—$1,368,413
Total Funding to Date—$2,846,994

Current Active Organizations and Grant Numbers

1. Rhode Island Hospital
   Providence, Rhode Island —HL-077221
2. Brigham and Women's Hospital
   Boston, Massachusetts —HL-081656

Clinical Research Consortium To Improve Resuscitation Outcomes, Initiated in Fiscal Year 2004

See Chapter 11. Clinical Trials.

Dynamic Evaluation of Percutaneous Coronary Intervention, Initiated in Fiscal Year 1997

This program, which complements prior NHLBI percutaneous transluminal coronary angioplasty (PTCA) registries and the New Approaches to Coronary Intervention Registry, is evaluating patterns of device usage, as well as immediate and follow-up outcomes in patients undergoing percutaneous transluminal coronary revascularization. Results will provide guidance to the cardiology community in selecting appropriate therapies and in designing clinical trials to evaluate competing devices.

Obligations

Funding History:
Fiscal Year 2006—$725,054
Fiscal Years 1997–2005—$5,455,365
Total Funding to Date—$6,180,419

Current Active Organization and Grant Number

1. University of Pittsburgh
   Pittsburgh, Pennsylvania —HL-033292

Family Blood Pressure Program, Initiated in Fiscal Year 1995

The objectives of this program are to identify major genes associated with high blood pressure and to investigate the interactions between genetic and environmental determinants of hypertension in defined populations, many of which consist of specific minority groups. The study consists of collaborative networks that share technology, data, skills, biological materials, and population resources.

Obligations

Funding History:
Fiscal Year 2006—$4,732,732
Fiscal Years 1995–2005—$88,494,060
Total Funding to Date—$93,226,792

Current Active Organizations and Grant Numbers

1. University of Utah
   Salt Lake City, Utah —HL-054471
2. Washington University
   St. Louis, Missouri —HL-054473
3. University of Texas
   Health Science Center
   Houston, Texas —HL-054481
4. Pacific Health Research Institute
   Honolulu, Hawaii —HL-054498
5. University of Michigan at Ann Arbor
   Ann Arbor, Michigan —HL-054512

Genetics of Coronary Artery Disease in Alaska Natives (GOCADAN), Initiated in Fiscal Year 2000

The purpose of this study is to document CVD and CVD risk factors in approximately 40 extended families (1,214 members from villages in Northern Alaska). Scientists seek to identify and characterize genes that contribute to CVD in this unique and understudied population.

Obligations

Funding History:
Fiscal Year 2006—$2,046,285
Fiscal Years 2000–2005—$9,792,055
Total Funding to Date—$11,838,340

Current Active Organizations and Grant Numbers

1. MedStar Research Institute
   Washington, DC —HL-064244
2. Norton Sound Health Corporation
   Nome, Alaska —HL-082458
3. Southwest Foundation for
   Biomedical Research
   San Antonio, Texas —HL-082490

Girls Health Enrichment Multisite Studies (GEMS), Initiated in Fiscal Year 1999

The objective of this project is to develop and test interventions to prevent obesity by decreasing weight gain during the high-risk transitional period from prepuberty to puberty in black girls who are at risk for developing obesity. Phase I (developmental and pilot studies) was completed in FY 2002. Two sites began Phase II trials in FY 2003.

Obligations

Funding History:
Fiscal Year 2006—$1,950,186
Fiscal Years 1999–2005—$17,468,009
Total Funding to Date—$19,418,195

Current Active Organizations and Grant Numbers

1. University of Memphis
   Memphis, Tennessee —HL-062662
2. Stanford University
   Stanford, Califorinia —HL-062663

Heart Failure: A Controlled Trial Investigating Outcomes of Exercise (HF-ACTION), Initiated in Fiscal Year 2002

The purpose of this trial is to determine the long-term safety and effectiveness of exercise training for patients with heart failure. Patients receiving the exercise regimen also will receive standard care and will be compared with patients receiving standard care alone.

Obligations

Funding History:
Fiscal Year 2006—$4,590,429
Fiscal Years 2002–2005—$29,527,693
Total Funding to Date—$34,118,122

Current Active Organizations and Grant Numbers

1. Duke University
   Durham, North Carolina —HL-063747
2. Case Western Reserve University
   Henry Ford Health System
   Detroit, Michigan —HL-064250
3. Oregon Health & Science University
   Portland, Oregon —HL-064257
4. Washington University
   St. Louis, Missouri —HL-064264
5. University of Colorado
   Health Sciences Center
   Denver, Colorado —HL-064265
6. Duke University
   Durham, North Carolina —HL-066461
7. Emory University
   Atlanta, Georgia —HL-066482
8. Wake Forest University
   Winston-Salem, North Carolina —HL-066491

9. Ohio State University
Columbus, Ohio —HL-066494
10. University of Alabama at Birmingham
Birmingham, Alabama —HL-066497
11. Case Western Reserve University
Cleveland, Ohio —HL-066501
12. Boston Medical Center
Boston, Massachusetts —HL-068973
13. University of California, Los Angeles
Los Angeles, California —HL-068980

Heart Failure Clinical Research Network, Initiated in Fiscal Year 2006

The purpose of this network is to accelerate research in the diagnosis and management of heart failure in order to improve outcomes through optimal application of existing therapies and evaluation of novel therapies.

Obligations

Funding History:
Fiscal Year 2006—$5,642,461
Total Funding to Date—$5,642,461

Current Active Organizations and Grant Numbers

1. Minneapolis Medical Research Foundation
Minneapolis, Minnesota —HL-084861
2. Duke University
Durham, North Carolina —HL-084875
3. Brigham and Women's Hospital
Boston, Massachusetts —HL-084877
4. University of Utah
Salt Lake City, Utah —HL-084889
5. Baylor College of Medicine
Houston, Texas —HL-084890
6. University of Vermont
Burlington, Vermont —HL-084899
7. Duke University
Durham, North Carolina —HL-084904
8. Mayo Clinic College of Medicine
Rochester, Minnesota —HL-084907
9. Montreal Heart Institute
Montreal, Quebec —HL-084931

Home Automatic External Defibrillator Trial (HAT), Initiated in Fiscal Year 2002

The purpose of this trial is to compare standard response (call 9-1-1 and give cardiopulmonary resuscitation) to sudden cardiac arrest to standard response augmented with automatic external defibrillator use provided by a spouse or other family member in 7,000 survivors of an anterior wall MI. The primary end point is mortality.

Obligations

Funding History:
Fiscal Year 2006—$2,114,588
Fiscal Years 2002–2005—$15,064,384
Total Funding to Date—$17,178,972

Current Active Organization and Grant Number

1. Seattle Institute for Cardiac Research
Seattle, Washington —HL-067972

IMMEDIATE Trial: Immediate Myocardial Metabolic Enhancement During Initial Assessment and Treatment in Emergency Care, Initiated in Fiscal Year 2004

The purpose of this program is to study the effects of early administration of glucose, insulin, and potassium (GIK) in reducing mortality in patients from acute coronary syndrome (ACS). Patients experiencing an ACS (including AMI and unstable angina pectoris) will be treated with GIK as soon as possible in prehospital emergency medical service settings or immediately upon arrival for those presenting to emergency departments.

Obligations

Funding History:
Fiscal Year 2006—$10,966,492
Fiscal Year 2004–2005—$14,684,147
Total Funding to Date—$25,650,639

Current Active Organizations and Grant Numbers

1. New England Medical Center Hospitals
Boston, Massachusetts —HL-077821
2. State University of New York
Stony Brook, New York —HL-077822
3. New England Medical Center Hospitals
Boston, Massachusetts —HL-077823
4. New England Medical Center Hospitals
Boston, Massachusetts —HL-077826

Interaction of Genes and Environment in Shaping Risk Factors for Heart, Lung, and Blood Diseases and Sleep Disorders, Initiated in Fiscal Year 2002

The purpose of this study is to identify novel genes that interact with specific environmental exposures to modify risk factors for heart, lung, and blood diseases

and sleep disorders. The genetic aspects of response to environmental change and related biological mechanisms will be studied using short-term, focused interventions in families. Subgroups will be identified based on genotypes that are most likely to benefit from targeted environmental changes designed to reduce the development or progression of heart, lung, and blood diseases or sleep disorders.

Obligations

Funding History:
Fiscal Year 2006—$640,556
Fiscal Years 2002–2005—$46,072,888
Total Funding to Date—$46,713,444

Current Active Organizations and Grant Numbers

1. Tulane University
   New Orleans, Louisiana —HL-072507
2. LSU Pennington Biomedical Research Center
   Baton Rouge, Louisiana —HL-072510
3. University of Maryland Baltimore Professional School
   Baltimore, Maryland —HL-072515
4. Johns Hopkins University
   Baltimore, Maryland —HL-072518
5. University of Minnesota, Twin Cities
   Minneapolis, Minnesota —HL-072524

NHLBI Clinical Proteomics Program, Initiated in Fiscal Year 2005

The purpose of this program is to promote systematic, comprehensive, large-scale validation of existing and new candidate protein markers that are appropriate for routine use in the diagnosis and management of heart, lung, and blood diseases and sleep disorders. The Program will facilitate validation of protein panels that may be used to predict disease susceptibility or to assist in differential diagnosis, disease staging, selection of individualized therapies, or monitoring of treatment responses. It will also establish a high-quality education and skills development program to ensure that scientists develop the expertise needed to address the complex, multifaceted challenges in clinical proteomics.

Obligations

Funding History:
Fiscal Year 2006—$4,920,669
Fiscal Year 2005—$5,103,660
Total Funding to Date—$10,024,329

Current Active Organizations and Grant Numbers

1. Mayo Clinic College of Medicine
   Rochester, Minnesota —HL-081331
2. Vanderbilt University
   Nashville, Tennessee —HL-081332
3. University of Colorado
   Denver, Colorado —HL-081335
4. Masschusetts General Hospital
   Boston, Massachusetts —HL-081341

Partnership Programs To Reduce Cardiovascular Health Disparities, Initiated in Fiscal Year 2004

The objectives of this study are to improve the provider and patient approaches to treatment of hypertension and diabetes, modify physician-related barriers to minority enrollment in clinical trials, improve patient adherence to treatment plans, and build sustainable research programs at minority-serving institutions.

Obligations

Funding History:
Fiscal Year 2006—$7,258,374
Fiscal Year 2004–2005—$13,670,752
Total Funding to Date—$20,929,126

Current Active Organizations and Grant Numbers

1. Bon Secours Hospital Baltimore, Inc.
   Baltimore, Maryland —HL-079150
2. University of Maryland Baltimore Professional School
   Baltimore, Maryland —HL-079151
3. Queen's Medical Center
   Honolulu, Hawaii —HL-079152
4. Cooper Green Hospital
   Birmingham, Alabama —HL-079153
5. Emory University
   Atlanta, Georgia —HL-079156
6. Denver Health and Hospital Authority
   Denver, Colorado —HL-079160
7. University of Hawaii at Manoa
   Honolulu, Hawaii —HL-079163
8. University of Alabama at Birmingham
   Birmingham, Alabama —HL-079171
9. University of Colorado Health Sciences Center
   Denver, Colorado —HL-079208
10. Morehouse School of Medicine
    Atlanta, Georgia —HL-079214

11. Jackson Hinds Comprehensive Health Center
Jackson, Mississippi —HL-079378
12. University of Mississippi Medical Center
Jackson, Mississippi —HL-079458

Pediatric Heart Network, Initiated in Fiscal Year 2006

See Chapter 11. Clinical Trials.

Pharmacogenetics Research Network, Initiated in Fiscal Year 2001

The purpose of this study is to establish a network to systematically evaluate candidate genes that may influence pharmacologic response to drug treatments for arrhythmia, heart failure, hypertension, and lipid disorders. Investigators seek to identify gene polymorphisms capable of predicting drug toxicity and efficacy. One of the projects has 50 percent minority participation.

Obligations

Funding History:
Fiscal Year 2006—$8,983,384
Fiscal Years 2001–2005—$39,541,200
Total Funding to Date—$48,524,584

Current Active Organizations and Grant Numbers

1. Vanderbilt University
Nashville, Tennessee —HL-065962
2. Children's Hospital and Research Center
Oakland, California —HL-069757
3. Stanford University
Stanford, California —GM-061374

Preventing Overweight Using Novel Dietary Strategies (POUNDS LOST), Initiated in Fiscal Year 2003

The purpose of this study is to compare the effects of four diets low in saturated fat and differing in macronutrient composition on weight loss and its maintenance in 800 overweight or obese adults. The diet consists of moderate fat (40 percent energy) or low fat (20 percent energy) with two different protein levels (15 and 25 percent). Approximately 20 percent of the participants will be minority.

Obligations

Funding History:
Fiscal Year 2006—$1,863,033
Fiscal Years 2003–2005—$4,916,790
Total Funding to Date—$6,779,823

Current Active Organization and Grant Number

1. Harvard School of Public Health
Boston, Massachusetts —HL-073286

Primordial Prevention of Overweight in American Indian Children, Initiated in Fiscal Year 2005

The purpose of this study is to prevent early childhood overweight in American Indian children. A cohort of children born over an 18-month period will be randomized to either a control or intervention condition. The intervention comprises a community-wide intervention coupled with individualized family counseling to improve nutrition and physical activity in infants and toddlers. A central feature of the project is to develop and test culturally appropriate interventions that can be incorporated into clinical programs of the community health care systems or delivered through public health approaches in Native communities.

Obligations

Funding History:
Fiscal Year 2006—$2,083,097
Fiscal Year 2005—$354,427
Total Funding to Date—$2,437,524

Current Active Organizations and Grant Numbers

1. Kaiser Foundation Research Institutes
Oakland, California —HL-081624
2. University of Washington
Seattle, Washington —HL-087322
3. University of Oklahoma
Oklahoma City, Oklahoma —HL-087354
4. University of Wisconsin
Madison, Wisconsin —HL-087381
5. Black Hills Center/American Indian Health
Rapid City, South Dakota —HL-087422

Programs of Excellence in Nanotechnology, Initiated in Fiscal Year 2005

The purpose of this program is to establish multidisciplinary teams to develp nanotechnology and biomolecular engineering tools and methodologies to detect and

analyze atherosclerotic plaque formation. The program presents an unique opportunity for research collaboration and skills training by bring bioengineering and nanotechnology solutions into medicine and vice versa.

Obligations

Funding History:
Fiscal Year 2006—$11,230,687
Fiscal Year 2005—$6,322,873
Total Funding to Date—$17,553,560

Current Active Organizations and Grant Numbers

1. Emory University
Atlanta, Georgia —HL-080711
2. Burnham Institute for Medical Research
La Jolla, California —HL-080718
3. Washington University
St. Louis, Missouri —HL-080729
4. Massachusetts General Hospital
Boston, Massachusetts —HL-080731

Programs of Genomic Applications (PGAs) for Heart, Lung, and Blood Diseases, Initiated in Fiscal Year 2000

The goal of this program is to develop information, tools, and resources to link genes to biological function. Specifically, researchers seek to identify human genes relevant to heart, lung, blood, and sleep functions. In addition, the PGAs will establish training programs for NHLBI-supported investigators in the use of genomic information and technologies.

Obligations

Funding History:
Fiscal Year 2006—$14,467,114
Fiscal Years 2000–2005—$180,640,497
Total Funding to Date—$195,107,611

Current Active Organizations and Grant Numbers

1. Medical College of Wisconsin
Milwaukee, Wisconsin —HL-066579
2. University of California, San Francisco
San Francisco, California —HL-066600
3. Jackson Laboratory
Bar Harbor, Maine —HL-066611
4. University of California, Los Angeles
Los Angeles, California —HL-066621
5. University of Washington
Seattle, Washington —HL-066642
6. University of California
Lawrence Berkeley Laboratory
Berkeley, California —HL-066681
7. University of Washington
Seattle, Washington —HL-066682

Stop Atherosclerosis in Native Diabetics Study (SANDS), Initiated in Fiscal Year 2002

This study will address the high incidence of CVD in a population with a high prevalence of diabetes, but relatively low levels of LDL cholesterol and blood pressure. It will compare aggressive lowering of LDL cholesterol and blood pressure to the usual care standard.

Obligations

Funding History:
Fiscal Year 2006—$2,074,057
Fiscal Years 2002–2005—$9,004,979
Total Funding to Date—$11,079,036

Current Active Organization and Grant Number

1. MedStar Research Institute
Washington, DC —HL-067031

Strong Heart Study, Initiated in Fiscal Year 1988

The objectives of this study are to survey CVD morbidity and mortality rates among three geographically diverse groups of American Indians and to estimate their levels of CVD risk factors. Phases II and III of the cohort study extended surveillance of community mortality and assessed development of CVD and changes in CVD risk factors. In Phase III, investigators added a substudy of asthma and a pilot family study. Phase IV expanded the family study to 120 families comprising 3,600 members to investigate genetic and environmental contributors of CVD. Phase V will examine the family study cohort to assess genetic relationships to risk factor change over a 5-year period.

Obligations

Funding History:
Fiscal Year 2006—$6,235,839
Fiscal Years 1988–2005—$51,738,304
Total Funding to Date—$57,974,143

Current Active Organizations and Grant Numbers

1. MedStar Research Institute
Washington, DC —HL-041642
2. Missouri Breaks Research, Inc.
Timberlake, South Dakota —HL-041652

3. University of Oklahoma Health Sciences Center
   Oklahoma City, Oklahoma —HL-041654
4. Southwest Foundation for Biomedical Research
   San Antonio, Texas —HL-065520
5. Weill Medical College of Cornell University
   New York, New York —HL-065521

Surgical Treatment for Ischemic Heart Failure (STICH), Initiated in Fiscal Year 2002

The purpose of this clinical trial is to determine whether CABG plus intensive medical therapy improves long-term survival of patients with heart failure and left ventricular (LV) dysfunction who have coronary artery disease amenable to surgical revascularization, compared to medical therapy alone; and to determine whether CABG plus surgical ventricular restoration to a more normal LV size improves survival free of subsequent hospitalizations of patients with anterior LV dysfunction, compared to CABG alone.

Obligations:

Funding History:
Fiscal Year 2006—$5,583,045
Fiscal Years 2002–2005—$19,946,837
Total Funding to Date—$25,529,882

Current Active Organizations and Grant Numbers

1. Thomas Jefferson University
   Philadelphia, Pennsylvania —HL-069009
2. Mayo Clinic College of Medicine
   Rochester, Minnesota —HL-069010
3. Duke University
   Durham, North Carolina —HL-069011
4. Northwestern University
   Chicago, Illinois —HL-069012
5. Duke University
   Durham, North Carolina —HL-069013
6. Duke University
   Durham, North Carolina —HL-069015
7. University of Southern California
   Los Angeles, California —HL-072683

Trial of Activity for Adolescent Girls (TAAG), Initiated in Fiscal Year 2000

See Chapter 11. Clinical Trials.

Weight Loss in Obese Adults With Cardiovascular Risk Factors: Clinical Interventions, Initiated in Fiscal Year 2006

The purpose of this study is to conduct clinical trials in primary care settings to test the effectiveness of weight loss interventions in obese patients who have additional cardiovascular risk factors. An important secondary focus of the effectiveness trials is to test strategies to improve patient adherence to evidence-based guidelines to reduce the other cardiovascular risk factors (e.g., elevated lipids, hypertension, or cigarette smoking) commonly present in obese individuals.

Obligations

Funding History:
Fiscal Year 2006—$2,567,146
Total Funding to Date—$2,567,146

Current Active Organizations and Grant Numbers

1. Brigham and Women's Hospital
   Boston, Massachusetts —HL-087071
2. University of Pennsylvania
   Philadelphia, Pennsylvania —HL-087072
3. Johns Hopkins University
   Baltimore, Maryland —HL-087085

Weight Loss Maintenance (WLM), Initiated in Fiscal Year 2003

The purpose of this multicenter trial is to evaluate the effectiveness of two strategies to maintain weight loss for 2½ years in approximately 800 overweight or obese adults. Individuals who are taking medication for hypertension of dyslipidemia or who are diabetic enter a 6-month weight program. Those who lose at least 9 pounds are randomized into one of three groups: one that provides monthly personal contacts with a trained interventionist, primarily by telephone; one that provides frequent contacts through an interactive Web-based program; or usual care. Forty percent of the participants will be black.

Obligations

Funding History:
Fiscal Year 2006—$4,014,660
Fiscal Years 2003–2005—$11,153,382
Total Funding to Date—$15,168,042

Current Active Organizations and Grant Numbers

1. Center for Health Research
   Portland, Oregon —HL-068676
2. Duke Hypertensive Center
   Durham, North Carolina —HL-068734
3. Center for Health Research
   Portland, Oregon —HL-068790
4. Johns Hopkins University
   Baltimore, Maryland —HL-068920
5. LSU Pennington Biomedical Research Center
   Baton Rouge, Louisiana —HL-068955

Lung Diseases Program

Asthma Clinical Research Network (ACRN) Phase II, Initiated in Fiscal Year 2003

See Chapter 11. Clinical Trials.

Centers for Reducing Asthma Disparities, Initiated in Fiscal Year 2002

The purpose of this study is to establish cooperative centers of research to reduce asthma disparities between whites and minorities and economically disadvantaged populations. The mission of the centers, comprising partnerships between minority-servicing medical institutions and research-intensive institutions, is to promote interdisciplinary investigation of factors that contribute to disparities in asthma, accelerate development and evaluation of strategies to promote effective asthma management among minority and economically disadvantaged populations, encourage training and career development for minority clinical research investigators, and improve the effectiveness of NHLBI-supported research-intensive institutions in developing and sustaining culturally appropriate research and demonstration activities on reducing disparities.

Obligations

Funding History:
Fiscal Year 2006—$4,946,024
Fiscal Years 2002–2005—$22,404,795
Total Funding to Date—$27,350,819

Current Active Organizations and Grant Numbers

1. Meharry Medical College
   Nashville, Tennessee —HL-072431
2. Howard University
   Washington, DC —HL-072433
3. Rhode Island Hospital
   Providence, Rhode Island —HL-072438
4. Johns Hopkins University
   Baltimore, Maryland —HL-072455
5. Vanderbilt University
   Nashville, Tennessee —HL-072471
6. Northwestern University
   Chicago, Illinois —HL-072478
7. Hektoen Institute for Medical Research
   Chicago, Illinois —HL-072496
8. University of Puerto Rico Medical Sciences
   San Juan, Puerto Rico —HL-072519

Childhood Asthma Management Program-Continuation Study (CAMP-CS)/Phase 2, Initiated in Fiscal Year 2003

The objectives of this observational study are to follow the original CAMP cohort for 4 more years into early adulthood to determine the effects of long-term (3.5 to 5.5 years) corticosteroid therapy, started at ages 5 to 12, on outcomes of pulmonary function, height, bone density, and clinical course of asthma; 31 percent of the participants are from minority groups.

Obligations

Funding History:
Fiscal Year 2006—$2,750,045
Fiscal Years 2003–2005—$6,155,523
Total Funding to Date—$8,905,568

Current Active Organizations and Grant Numbers

1. Washington University
   St. Louis, Missouri —HL-075232
2. Hospital for Sick Children
   Toronto, Ontario —HL-075407
3. Johns Hopkins University
   Baltimore, Maryland —HL-075408
4. Asthma, Inc.
   Seattle, Washington —HL-075409
5. University of California, San Diego
   La Jolla, California —HL-075415
6. National Jewish Medical and Research Center
   Denver, Colorado —HL-075416
7. Johns Hopkins University
   Baltimore, Maryland —HL-075417
8. Brigham and Women's Hospital
   Boston, Massachusetts —HL-075419
9. University of New Mexico
   Albuquerque, New Mexico —HL-075420

Childhood Asthma Research and Education (CARE) Network, Initiated in Fiscal Year 1999

See Chapter 11. Clinical Trials.

Clinical Trial of Acid Reflux Therapy in Asthma, Initiated in Fiscal Year 2003

The purpose of this clinical trial is to test the hypothesis that treatment of gastroesophageal reflux with proton-pump inhibitors will reduce the frequency of exacerbations in patients with inadequately controlled asthma.

Obligations

Funding History:
Fiscal Year 2006—$772,866
Fiscal Year 2003–2005—$2,310,686
Total Funding to Date—$3,083,552

Current Active Organization and Grant Number

1. Johns Hopkins University
Baltimore, Maryland —HL-072968

Collaborative Program in Bronchopulmonary Dysplasia, Initiated in Fiscal Year 1999

The objectives of this program are to support a multi-institutional collaborative research effort by providing a well-defined model of prematurity and bronchopulmonary dysplasia to investigators, and to study mechanisms of lung pathobiology that underlie development of chronic lung disease of prematurity.

Obligations

Funding History:
Fiscal Year 2006—$5,075,067
Fiscal Years 1999–2005—$31,656,005
Total Funding to Date—$36,731,072

Current Active Organizations and Grant Numbers

1. Southwest Foundation for Biomedical Research
San Antonio, Texas —HL-052636
2. Brigham and Women's Hospital
Boston, Massachusetts —HL-052638
3. University of California, San Francisco
San Francisco, California —HL-056061
4. National Jewish Medical and Research Center
Denver, Colorado —HL-056263
5. Barnes Jewish Hospital
St. Louis, Missouri —HL-063387
6. National Jewish Medical and Research Center
Denver, Colorado —HL-063397
7. University of Texas Southwestern Medical Center
Dallas, Texas —HL-063399
8. University of Rochester
Rochester, New York —HL-063400
9. Children's Hospital of Philadelphia
Philadelphia, Pennsylvania —HL-075900

COPD Clinical Research Network, Initiated in Fiscal Year 2003

See Chapter 11. Clinical Trials.

Early Antipseudomonal Therapy in Cystic Fibrosis, Initiated in Fiscal Year 2004

The purpose of this study is to determine a safe, effective, and systematic approach for treating young children (ages 1 to 12 years) with cystic fibrosis who are found to be infected with *Pseudomonas aemginosa* (Pa). The goal is to intervene with antipseudomonal therapy at the first isolation of Pa to delay or prevent chronic infections that lead to irreversible lung destruction.

Obligations

Funding History:
Fiscal Year 2006—$1,033,655
Fiscal Year 2004–2005—$2,111,618
Total Funding to Date—$3,145,273

Current Active Organization and Grant Number

1. Children's Hospital and Regional Medical Center
Seattle, Washington —HL-080310

Idiopathic Pulmonary Fibrosis Clinical Research Network, Initiated in Fiscal Year 2005

See Chapter 11. Clinical Trials.

Pharmacogenetics of Asthma Treatment, Initiated in Fiscal Year 2000

The objective of this project is to bring together research experts in asthma, epidemiology, statistics, bioinformatics, physiology, clinical trials, genetics, and genomics to focus on the pharmacogenetics of asthma treatment.

Obligations

Funding History:
Fiscal Year 2006—$3,285,718
Fiscal Years 2000–2005—$14,209,020
Total Funding to Date—$17,494,738

Current Active Organization and Grant Number

1. Brigham and Women's Hospital
Boston, Massachusetts —HL-065899

Prospective Investigation of Pulmonary Embolism Diagnosis III (PIOPED III), Initiated in Fiscal Year 2005

The purpose of this study is to determine the diagnostic accuracy of gadolinium-enhanced magnetic resonance angiography of the pulmonary arteries in combination with magnetic resonance venography of the lower extremities for the detection of acute venous thromboembolic disease.

Obligations

Funding History:
Fiscal Year 2006—$4,341,911
Fiscal Year 2005—$2,301,770
Total Funding to Date—$6,643,681

Current Active Organizations and Grant Numbers

1. Massachusetts General Hospital
Boston, Massachusetts —HL-077149
2. University of Michigan
Ann Arbor, Michigan —HL-077150
3. University of Calgary
Calgary, Alberta —HL-077151
4. Emory University
Atlanta, Georgia —HL-077153
5. Washington University
St. Louis, Missouri —HL-077154
6. George Washington University
Washington, DC —HL-077155
7. St. Joseph Mercy-Oakland
Pontiac, Michigan —HL-077358
8. New York University
New York, New York —HL-081593
9. St. Joseph Mercy-Oakland
Pontiac, Michigan —HL-081594

Study of Acid Reflux Therapy for Children With Asthma, Initiated in Fiscal Year 2006

The purpose of this randomized controlled clinical trial is to investigate whether an approved proton-pump inhibitor lansoprazole will reduce asthma exacerbations in children with poorly controlled asthma, ages 6–16 years.

Obligations

Funding History:
Fiscal Year 2006—$774,454
Total Funding to Date—$774,454

Current Active Organizations and Grant Numbers

1. Emory University
Atlanta, Georgia —HL-080433
2. Johns Hopkins University
Baltimore, Maryland —HL-080450

Blood Diseases and Resources

Blood and Marrow Transplant Clinical Research Network, Initiated in Fiscal Year 2001

See Chapter 11. Clinical Trials.

Center for Human Cell Therapy, Initiated in Fiscal Year 2004

The purpose of this Center is to serve as a unique resource to facilitate the development of new cellular therapies for a wide range of human diseases, especially heart, lung, and blood diseases and sleep disorders.

Obligations

Funding History:
Fiscal Year 2006—$2,101,631
Fiscal Year 2004–2005—$5,179,743
Total Funding to Date—$7,281,374

Current Active Organization and Grant Number

1. CBR Institute for Biomedical Research
Boston, Massachusetts —HL-074355

Functional Outcomes in Cardiovascular Patients Undergoing Surgical Hip Fracture Repair (FOCUS), Initiated in Fiscal Year 2003

The purpose of this trial is to test whether a more aggressive transfusion strategy that maintains postoperative Hgb levels above 10 g/dl improves functional outcome in cardiovascular patients who are over age 50 and undergoing surgical hip fracture surgery compared to a more conservative strategy that withholds blood transfusion until the patient develops symptoms of anemia.

Obligations

Funding History:
Fiscal Year 2006—$2,446,287
Fiscal Years 2003–2005—$6,357,932
Total Funding to Date—$8,804,219

Current Active Organizations and Grant Numbers

1. Robert Wood Johnson Medical School
University of Medicine and Dentistry
of New Jersey
Piscataway, New Jersey —HL-073958
2. Maryland Medical Research Institute, Inc.
Baltimore, Maryland —HL-074815

Sickle Cell Disease Clinical Research Network, Initiated in Fiscal Year 2006

See Chapter 11. Clinical Trials.

Stroke With Transfusions Changing to Hydroxyurea (SWITCH), Initiated in Fiscal Year 2005

The purpose of this Phase III clinical trial is to compare standard therapy (transfusions and chelation) with alternative therapy (hydroxyurea and phlebotomy) for the prevention of secondary stroke and management of iron overload in children with sickle cell anemia. Additional objectives include comparisons of growth and development, frequency of nonstroke neurological and other sickle-related events, and quality of life. The patient population will be black.

Obligations

Funding History:
Fiscal Year 2006—$3,931,995
Fiscal Year 2005—$3,345,345
Total Funding to Date—$7,277,340

Current Active Organizations and Grant Numbers

1. St. Jude Children's Research Hospital
Memphis, Tennessee —HL-077878
2. Rho Federal Systems Division, Inc.
Chapel Hill, North Carolina —HL-078987

Thalassemia (Cooley's Anemia) Clinical Research Network

See Chapter 11. Clinical Trials.

Transfusion Medicine/Hemostasis Clinical Research Network, Initiated in Fiscal Year 2002

See Chapter 11. Clinical Trials.

National Center on Sleep Disorders Research

Apnea Positive Pressure Long-Term Efficacy Study (APPLES), Initiated in Fiscal Year 2002

The purpose of this study is to evaluate the effectiveness of continuous positive airway pressure (CPAP) therapy to provide significant, stable, and long-term neurocognitive or other benefits to patients with obstructive sleep apnea (OSA). Investigators will identify specific neurocognitive deficits associated with OSA and determine which ones are reversible and most sensitive to the effects of CPAP therapy.

Obligations

Funding History:
Fiscal Year 2006—$0
Fiscal Years 2002–2005—$12,542,181
Total Funding to Date—$12,542,181

Current Active Organization and Grant Number

1. Stanford University
Stanford, California —HL-068060

Randomized Controlled Study of Adenotonsillectomy for Childhood Sleep Apnea, Initiated in Fiscal Year 2006

The purpose of this randomized controlled study is to compare adenotonsillectomy versus no surgery for obstructive sleep apnea in children.

Obligations

Funding History:
Fiscal Year 2006—$2,267,140
Total Funding to Date—$2,267,140

Current Active Organizations and Grant Numbers

1. Case Western Reserve University
Cleveland, Ohio —HL-083075
2. University of Pennsylvania
Philadelphia, Pennsylvania —HL-083129

Sleep Heart Health Study, Initiated in Fiscal Year 1999

The purpose of this multicenter observational study is to determine the degree to which sleep apnea is an independent or contributing risk factor for the development of cardiovascular or cerebrovascular disease.

Obligations

Funding History:
Fiscal Year 2006—$907,548
Fiscal Years 1999–2005—$19,603,693
Total Funding to Date—$20,511,241

Current Active Organizations and Grant Numbers

1. University of California, Davis
   Davis, California —HL-053916
2. New York University Medical Center
   New York, New York —HL-053931
3. University of Minnesota, Twin Cities
   Minneapolis, Minnesota —HL-053934
4. Johns Hopkins University
   Baltimore, Maryland —HL-053937
5. University of Arizona
   Tucson, Arizona —HL-053938
6. Boston University
   Boston, Massachusetts —HL-053941
7. Missouri Breaks Research, Inc.
   Timberlake, South Dakota —HL-063429
8. Case Western Reserve University
   Cleveland, Ohio —HL-063463
9. Johns Hopkins University
   Baltimore, Maryland —HL-064360
10. University of Pittsburgh
    Pittsburgh, Pennsylvania —HL-077813

NHLBI Research Centers (P50, U54, P30) Programs

Specialized Centers of Research (P50), Specialized Centers of Clinically Oriented Research (P50), and Centers of Excellence in Translational Human Stem Cell Research (P50) Programs

The NHLBI initiated the SCOR program in 1971 to encourage translational research—converting basic science findings to the clinic—in high priority areas. The SCOR concept emphasizes multidisciplinary research (i.e., basic science and clinical investigations) on diseases relevant to the Institute's mission. In 2002, the NHLBI revised the SCOR program—primarily on recommendation from the NHLBAC—to place more emphasis on clinical research projects. The newly developed SCCOR program still requires clinical and basic scientists to work together on a unified theme, but now requires at least 50 percent of the projects to be clinical. The Centers of Excellence in Translational Human Stem Cell Research was initiated in 2005 to accelerate the translation of basic scientific discoveries in human stem cell biology to new treatments for patients. Listed below is the funding history for the individual SCORs/SCCORs and Centers of Excellence supported by the Institute.

		Obligations (Dollars in Thousands)		
Area of Concentration	**Period of Operation**	**Prior to FY 2006**	**FY 2006**	**Total to Date**
Heart and Vascular Diseases Program				
Cardiac Dysfunction and Disease (SCCOR)	2005–	$ 16,497	$ 16,923	$ 33,420
Molecular Medicine and Atherosclerosis	1997–	68,486	8,256	76,742
Pediatric Heart Developmnt and Disease (SCCOR)	2004–	26,528	12,891	39,419
Vascular Injury, Repair, and Remodeling (SCCOR)	2006–	—	15,324	15,324
Subtotal, Heart and Vascular Diseases Program		111,511	53,394	164,905
Lung Diseases Program				
Airway Biology and Pathogenesis of Cystic Fibrosis	1988–	62,373	3,631	66,004
Cellular and Molecular Mechanisms of Asthma	1996–	118,388	3,678	122,066
Host Factors in Chronic Lung Diseases (SCCOR)	2006–	—	7,939	7,939
Pathobiology of Fibrotic Lung Disease	1997–	44,451	1,894	46,345
Pathobiology of Lung Development	1996–	70,257	1,319	71,576
Translational Research in Acute Lung Injury (SCCOR)	2003–	35,632	12,329	47,961
Subtotal, Lung Diseases Program		331,101	30,790	361,891
Blood Diseases and Resources Program				
Hemostatic and Thrombotic Diseases (SCCOR)	2006–	—	8,063	8,063
Transfusion Biology and Medicine (SCCOR)	2005–	4,400	4,459	8,859
Subtotal, Blood Diseases and Resources Program		4,400	12,522	16,922
National Center on Sleep Disorders Research				
Neurobiology of Sleep and Sleep Apnea	1998–	41,310	6,215	47,525
Subtotal, National Center on Sleep Disorders Research		41,310	6,215	47,525
Total, Specialized Centers of Research (P50)		488,322	102,921	591,243
Centers of Excellence in Translational Human Stem Cell Research	2005–	1,509	1,453	2,962
Subtotal, Centers of Excellence in Translational Human Stem Cell Research		1,509	1,453	2,962
Total, (P50)		**$489,831**	**$104,374**	**$594,205**

Heart and Vascular Diseases Program

Cardiac Dysfunction and Disease

The purpose of this SCCOR is to foster multidisciplinary research on clinically relevant questions related to dysfunction and disease of the myocardium. The program will enable rapid application of basic science findings to the prevention, diagnosis, and treatment of cardiac disorders, including ischemic and other cardiomyopathies, left ventricular dysfunction, metabolic abnormalities, heart failure, and rhythm disturbances. Because some segments of the population disproportionately suffer from heart disease, research that addresses issues of health disparity will be emphasized.

Obligations

Fiscal Year 2006—$16,922,848

Current Active Organizations and Grant Numbers

1. Columbia University
   Health Science Center
   New York, New York —HL-077096
2. University of Alabama at Birmingham
   Birmingham, Alabama —HL-077100
3. University of Cincinnati
   Cincinnati, Ohio —HL-077101
4. Cleveland Clinical Lerner College
   Cleveland, Ohio —HL-077107
5. Washington University
   St. Louis, Missouri —HL-077113

Molecular Medicine and Atherosclerosis

The goal of this SCOR is to advance understanding of the etiology and pathobiology of the atherosclerotic lesion at the molecular level through modern methods and approaches of molecular medicine. Some of the subprojects have a large minority patient population.

Obligations

Fiscal Year 2006—$8,256,190

Current Active Organizations and Grant Numbers

1. Columbia University
   New York, New York —HL-056984
2. Brigham and Women's Hospital
   Boston, Massachusetts —HL-056985
3. University of California, San Diego
   La Jolla, California —HL-056989
4. University of Pennsylvania
   Philadelphia, Pennsylvania —HL-070128

Pediatric Heart Development and Disease

The purpose of this SCCOR is to foster multidisciplinary collaborations so that basic research advances can be translated rapidly to clinical care for children with heart disease. Research focus ranges from the genetic basis of heart valve disease to clinical trials of novel surgical strategies for congenital heart disease repair and immune modulation in pediatric heart transplantation. Two of the centers will have Clinical Research Skills Development Cores to train fellows and junior faculty in clinical research methods.

Obligations

Fiscal Year 2006—$12,890,955

Current Active Organizations and Grant Numbers

1. Children's Hospital Medical Center
   Cincinnati, Ohio —HL-074728
2. Children's Hospital of Philadelphia
   Philadelphia, Pennsylvania —HL-074731
3. University of Pittsburgh
   Pittsburgh, Pennsylvania —HL-074732
4. Children's Hospital
   Boston, Massachusetts —HL-074734

Vascular Injury, Repair, and Remodeling

The purpose of this SCCOR is to foster multidisciplinary, clinically relevant research on vascular injury, repair, and remodeling. The program emphasizes development and translation of basic discoveries to understand the mechanisms of vascular disease; improved detection, characterization, staging, and management of vascular disease through use of cutting-edge methodologies, such as nanotechnology, molecular imaging, genomics, proteomics, and quantitative systems analysis; and development of new methods to treat vascular diseases such as cell- and gene-based therapies for regenerative medicine.

Obligations

Fiscal Year 2006—$15,324,352

Current Active Organizations and Grant Numbers

1. Washington University
   St. Louis, Missouri —HL-083762
2. University of Texas Health
   Science Center
   Houston, Texas —HL-083794
3. University of Pennsylvania
   Philadelphia, Pennsylvania —HL-083799

4. Stanford University
   Stanford, California —HL-083800
5. Boston University Medical Campus
   Boston, Massachusetts —HL-083801
6. Beth Israel Deaconess Medical Center
   Boston, Massachusetts —HL-083813

Lung Diseases Program

Airway Biology and Pathogenesis of Cystic Fibrosis

The goals of this SCOR are to investigate the basic mechanisms underlying cystic fibrosis, develop new hypotheses, and apply innovative strategies for approaching clinical and fundamental issues.

Obligations

Fiscal Year 2006—$3,630,996

Current Active Organizations and Grant Numbers

1. University of North Carolina
   at Chapel Hill
   Chapel Hill, North Carolina —HL-060280
2. University of Iowa
   Iowa City, Iowa —HL-061234

Cellular and Molecular Mechanisms of Asthma

The objective of this SCOR is to apply critical science and technology to increase understanding of cellular and molecular mechanisms of asthma, including those mechanisms underlying the biological impact of environmental factors.

Obligations

Fiscal Year 2006—$3,678,237

Current Active Organizations and Grant Numbers

1. University of New Mexico
   Albuquerque, New Mexico —HL-056384
2. University of Wisconsin
   Madison, Wisconsin —HL-056396

Host Factors in Chronic Lung Diseases

The purpose of this SCCOR is to identify alterations in host responses and lung homeostasis and to determine how the dysregulation contributes to development or progression of chronic lung diseases. Enhanced understanding of these processes should facilitate identification of new targets for intervention, providing the basis for development of new therapeutic options for prevention and treatment of chronic lung diseases.

Obligations

Fiscal Year 2006—$7,939,046

Current Active Organizations and Grant Numbers

1. Duke University
   Durham, North Carolina —HL-084917
2. Children's Hospital
   Pittsburgh, Pennsylvania —HL-084932
3. University of North Carolina
   Chapel Hill, North Carolina —HL-084934

Pathobiology of Fibrotic Lung Disease

The purpose of this SCOR is to study cellular and molecular mechanisms involved in transition from inflammatory events associated with early fibrotic disease to later processes involving wound healing, repair, and fibrosis.

Obligations

Fiscal Year 2006—$1,893,619

Current Active Organization and Grant Number

1. University of Michigan at Ann Arbor
   Ann Arbor, Michigan —HL-056402

Pathobiology of Lung Development

The objective of this SCOR is to foster multidisciplinary research enabling basic science findings to be rapidly applied to clinical problems related to lung development. The program focuses on identification of the molecular variables involved in lung development and assessment of the impact of injury during critical periods.

Obligations

Fiscal Year 2006—$1,319,019

Current Active Organization and Grant Number

1. University of Colorado
   Health Sciences Center
   Denver, Colorado —HL-057144

Translational Research in Acute Lung Injury

The purpose of this SCCOR is to foster multidisciplinary research to improve the prevention, diagnosis, and treatment of acute lung injury and its more severe

form—adult respiratory distress syndrome. This program includes Phase II clinical trials and studies of molecular mechanisms of inflammation and coagulation, gene and protein expression, and cell and animal models of lung injury.

Obligations

Fiscal Year 2006—$12,329,192

Current Active Organizations and Grant Numbers

1. Johns Hopkins University
   Baltimore, Maryland —HL-073994
2. University of Washington
   Seattle, Washington —HL-073996
3. University of California, San Francisco
   San Francisco, California —HL-074005
4. University of Michigan at Ann Arbor
   Ann Arbor, Michigan —HL-074024

Blood Diseases and Resources Program

Hemostatic and Thrombotic Disorders

The purpose of this SCCOR is to conduct multidisciplinary research to improve the prevention, diagnosis, and treatment of thrombotic and bleeding disorders. The program will support rapid translation of basic science findings into clinical application.

Obligations

Fiscal Year 2006—$8,062,898

Current Active Organizations and Grant Numbers

1. Vanderbilt University
   Nashville, Tennessee —HL-081009
2. Cleveland Clinic Lerner College
   Cleveland, Ohio —HL-081011
3. University of Pennsylvania
   Philadelphia, Pennsylvania —HL-081012

Transfusion Biology and Medicine

The purpose of this SCOR is to foster new approaches for improving the availability, efficacy, safety, and quality of blood and blood products for therapeutic uses. One of the centers has a large minority population.

Obligations

Fiscal Year 2006—$4,459,397

Current Active Organizations and Grant Numbers

1. Puget Sound Blood Center
   Seattle, Washington —HL-081015
2. University of California, San Francisco
   San Francisco, California —HL-081027

National Center on Sleep Disorders Research

Neurobiology of Sleep and Sleep Apnea

The objective of this SCOR is to integrate molecular, cellular, and genetic approaches to sleep control with clinical investigations on the etiology and pathogenesis of sleep disorders, particularly sleep apnea.

Obligations

Fiscal Year 2006—$6,214,930

Current Active Organizations and Grant Numbers

1. University of Pennsylvania
   Philadelphia, Pennsylvania —HL-060287
2. Brigham and Women's Hospital
   Boston, Massachusetts —HL-060292
3. University of California, Los Angeles
   Los Angeles, California —HL-060296

Centers of Excellence in Translational Human Stem Cell Research (P50) Program

The purpose of this program is to stimulate multidisciplinary collaboration among basic stem cell biologists, researchers, and clinicians with disease-specific expertise; physicians and surgeons skilled in innovative modes of cell delivery; and investigators experienced in developing and assessing animal models of human diseases to conduct projects such as preclinical studies for cell-based therapy employing human stem cells in animal models. Research findings will ultimately lead to innovative approaches for the prevention, treatment, and cure of disease, and will accelerate the translation of basic scientific discoveries into new therapies.

Obligations

Fiscal Year 2006—$1,452,936

Current Active Organization and Grant Number

1. University of California, Davis
   Davis, California —HL-085036

Comprehensive Sickle Cell Centers (U54) Program

The Comprehensive Sickle Cell Centers (CSCC) were instituted in FY 1972 to bridge the gap between research and service by combining basic and clinical research, clinical trials and applications training, and community service projects into one program. The patients recruited for the clinical studies are primarily from minority populations.

Obligations

Fiscal Year 2006—$23,927,946

Current Active Organizations and Grant Numbers

1. Children's Hospital and Research Center
   Oakland, California —HL-070583
2. Thomas Jefferson University
   Philadelphia, Pennsylvania —HL-070585
3. Rho Federal Systems Division, Inc.
   Chapel Hill, North Carolina —HL-070587
4. University of Texas
   Southwestern Medical Center
   Dallas, Texas —HL-070588
5. St. Jude Children's Research Hospital
   Memphis, Tennessee —HL-070590
6. University of Southern California
   Los Angeles, California —HL-070595
7. Children's Hospital of Philadelphia
   Philadelphia, Pennsylvania —HL-070596
8. Duke University
   Durham, North Carolina —HL-070769
9. Boston Medical Center
   Boston, Massachusetts —HL-070819
10. Children's Hospital Research Center
    Cincinnati, Ohio —HL-070871
11. Yeshiva University
    New York, New York —HL-070994

Specialized Centers for Cell-Based Therapies for Heart, Lung, and Blood Diseases (U54) Program

The Specialized Centers for Cell-Based Therapies Program, which includes a Data and Coordinating Center, was initiated in FY 2005 to support preclinical and clinical studies for cell-based therapy for heart, lung, and blood diseases and sleep disorders. A key feature of the program is the ability to conduct preclinical studies in the first year or two of the program, in order to meet the requirements for an Investigational New Drug application prior to initiating clinical studies. Clinical studies are expected to be initiated by the beginning of the third year.

Obligations

Fiscal Year 2006—$6,901,976

Current Active Organizations and Grant Numbers

1. Baylor College of Medicine
   Houston, Texas —HL-081007
2. EMMES Corporation
   Rockville, Maryland —HL-081021
3. Johns Hopkins University
   Baltimore, Maryland —HL-081028
4. Massachusetts General Hospital
   Boston, Massachusetts —HL-081030

Centers for AIDS Research (P30) Program

The NHLBI, along with five other NIH Institutes, contributes to the support of six Centers for AIDS Research that were established to provide a multidisciplinary environment that promotes basic, clinical, behavioral, and translational research activities in the prevention, detection, and treatment of HIV infection and AIDS. Almost half of the patient population comes from minority groups.

Obligations

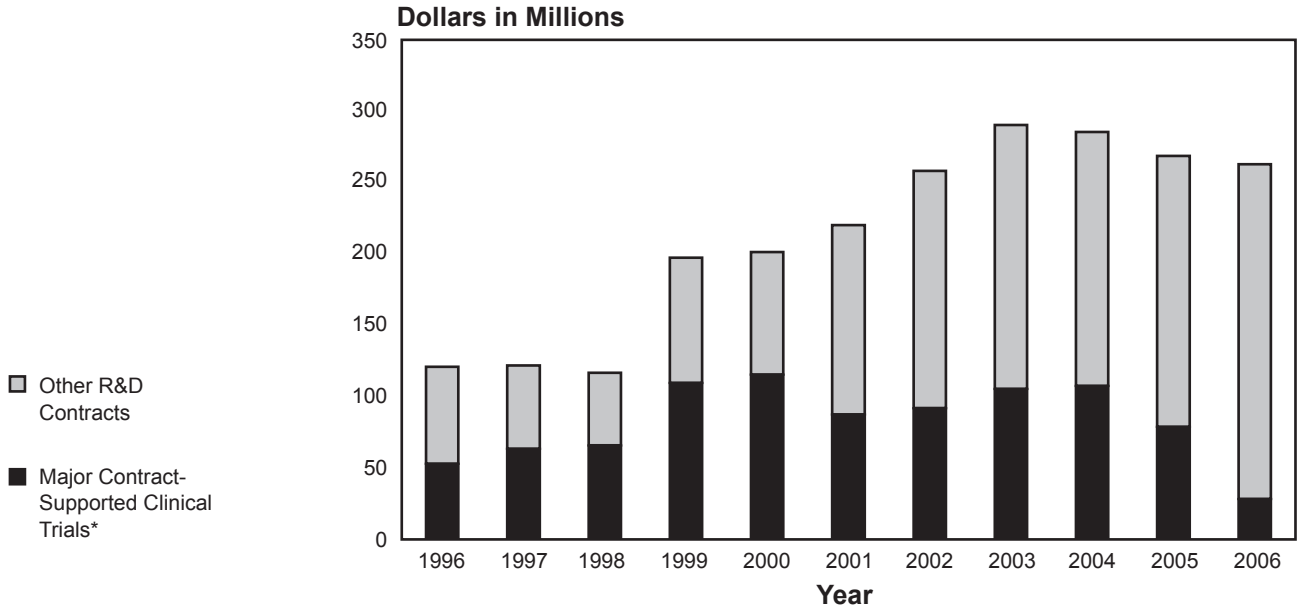
Fiscal Year 2006—$2,960,699

Current Active Organizations and Grant Numbers

1. New York University
   School of Medicine
   New York, New York —AI-027742
2. University of Washington
   Seattle, Washington —AI-027757
3. University of California, San Francisco
   San Francisco, California —AI-027763
4. University of Alabama at Birmingham
   Birmingham, Alabama —AI-027767
5. University of California, Los Angeles
   Los Angeles, California —AI-028697
6. Baylor University
   Houston, Texas —AI-036211
7. University of California, San Diego
   La Jolla, California —AI-036214
8. Case Western Reserve University
   Cleveland, Ohio —AI-036219
9. University of Massachusetts
   Medical School
   Worcester, Massachusetts —AI-042845
10. Miriam Hospital
    Providence, Rhode Island —AI-042853
11. University of Pennsylvania
    Philadelphia, Pennsylvania —AI-045008
12. Emory University
    Atlanta, Georgia —AI-050409
13. University of North Carolina
    at Chapel Hill
    Chapel Hill, North Carolina —AI-050410
14. Yeshiva University
    New York, New York —AI-051519
15. University of Colorado
    Health Sciences Center
    Denver, Colorado —AI-054907
16. Vanderbilt University
    Nashville, Tennessee —AI-054999
17. Harvard Medical School
    Boston, Massachusetts —AI-060354
18. Duke University
    Durham, North Carolina —AI-064518

10. Research and Development Contracts

NHLBI Research and Development Contract Obligations*: Fiscal Years 1996–2006



* For detailed data on contract-supported clinical trials, see Chapter 11.

NHLBI Total Research and Development Contract Obligations: Fiscal Years 1996–2006

Dollars (Thousands)

	Fiscal Year										
	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Heart	$ 80,373	$ 84,820	$ 77,886	$ 93,270	$ 98,715	$125,291	$155,971	$195,425	$187,043	$181,970	$201,196
Lung	21,032	18,183	13,123	25,432	23,341	10,993	16,578	11,745	14,131	20,946	25,902
Blood	19,522	18,934	25,695	15,436	21,538	24,572	26,751	20,082	25,460	27,831	23,629
Women's Health Initiative	—	—	—	63,100	57,700	59,200	59,000	63,222	58,838	37,826	12,124
Total	**$120,927[A]**	**$121,937[B]**	**$116,704[C]**	**$197,238[D]**	**$201,294[E]**	**$220,056[F]**	**$258,300[G]**	**$290,474[H]**	**$285,472[I]**	**$268,573[J]**	**$262,851[K]**

A Includes Program Evaluation Assessment of $4,250,000.
B Includes Program Evaluation and IMPAC II Assessments of $8,986,000.
C Includes Program Evaluation and IMPAC II Assessments of $12,589,000.
D Includes Program Evaluation and IMPAC II Assessments of $14,904,000.
E Includes Program Evaluation and IMPAC II Assessments of $17,944,000.
F Includes Program Evaluation and IMPAC II Assessments of $24,579,000.
G Includes Program Evaluation and IMPAC II Assessments of $35,827,000.
H Includes Program Evaluation and IMPAC II Assessments of $54,550,000.
I Includes Program Evaluation and IMPAC II Assessments of $57,545,722.
J Includes Program Evaluation and IMPAC II Assessments of $64,399,000.
K Includes Program Evaluation and IMPAC II Assessments of $67,795,000.

Major NHLBI Research and Development Contracts by Program

	Total Obligations Prior to FY 2005	Total FY 2006 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Atherosclerosis Risk in Communities (ARIC)	$121,966,244	$6,344,206	$128,310,450
Candidate Gene Association Research	—	2,789,517	2,789,517
Cardiovascular Health Study (CHS)	75,886,177	930,000	76,816,177
Coronary Artery Risk Development in Young Adults (CARDIA)	71,838,396	6,881,765	78,720,161
DNA Resequencing and Genotyping	11,000,000	7,000,000	18,000,000
Framingham Heart Study	62,166,638	10,907,043	73,073,681
Genetically Triggered Thoracic Aortic Aneurysms and Other Cardiovascular Conditions (GENTAC): National Registry	—	1,391,748	1,391,748
Hispanic Community Health Study (HCHS)	—	2,900,000	2,900,000
Jackson Heart Study (JHS)	20,219,989	3,535,576	23,755,565
Multi-Ethnic Study of Atherosclerosis (MESA)	54,269,999	8,563,705	62,833,704
Pediatric Circulatory Support	8,581,202	5,959,141	14,540,343
Proteomics Initiative	78,893,890	18,740,000	97,633,890
Registry for Mechanical Circulatory Support	1,215,702	1,585,877	2,801,579
SNP Health Association Research (SHARE)	—	2,000,000	2,000,000
Translational Behavioral Science Research Consortium	20,430,569	—	20,430,569
Lung Diseases			
Lung Tissue Research Consortium	10,499,994	12,598,812	23,098,806
Tuberculosis Curriculum Coordinating Center	3,750,000	1,125,000	4,875,000
Blood Diseases and Resources			
Iron Overload and Hereditary Hemochromatosis	25,979,773	469,227	26,449,000
Maintenance of Animals for Hepatitis or AIDS Research	8,805,530	160,474	8,966,004
Maintenance of NHLBI Biological Specimen Repository	6,594,342	1,031,572	7,625,914
Production of Recombinant B19 Parvovirus Capsids	2,483,750	666,950	3,150,700
Retrovirus Epidemiology Donor Study (REDS)	86,865,125	8,955,049	95,820,174
Sickle Cell Disease Health-Related Quality of Life Questionnaire	584,008	708,000	1,292,008
Somatic Cell Therapy Processing Facilities	15,576,209	6,139,526	21,715,735

Heart and Vascular Diseases Program

Atherosclerosis Risk in Communities (ARIC), Initiated in Fiscal Year 1985

The ARIC program is a large-scale, long-term program that is measuring associations of CHD risk factors with atherosclerosis by race, gender, and geographic location. It focuses on early detection of CVD before symptoms, heart attacks, or strokes occur. The project consists of two groups: a community surveillance component and a cohort component from four communities. Three of the cohort components represent the racial mix of their community, whereas the fourth is exclusively black.

Obligations

Funding History:
Fiscal Year 2006—$6,344,206
Fiscal Years 1985–2005—$121,966,244
Total Funding to Date—$128,310,450

Current Active Organizations and Contract Numbers

1. University of North Carolina at Chapel Hill
   Chapel Hill, North Carolina —HC-55015
2. Baylor College of Medicine
   Houston, Texas —HC-55016
3. University of North Carolina at Chapel Hill
   Chapel Hill, North Carolina —HC-55018
4. University of Minnesota, Twin Cities
   Minneapolis, Minnesota —HC-55019

5. Johns Hopkins University
   Baltimore, Maryland —HC-55020
6. Mississippi Medical Center
   Jackson, Mississippi —HC-55021
7. University of Texas
   Health Science Center
   Houston, Texas —HC-55022

Candidate Gene Association Resources, Initiated in Fiscal Year 2006

This program establishes a genotyping and bioinformatics center to perform high-throughput genotyping for candidate gene association studies in up to 50,000 participants, and a genome-wide association study in about 500 disease cases and 1,000 controls. The data will be combined with available phenotype data to form a genotype-phenotype resource for public use. DNA for the 50,000-person sample will be collected from multiple NHLBI cohort studies that have stored samples and available data on a wide array of heart, lung, blood, and sleep phenotypes.

Obligations

Funding History:
Fiscal Year 2006—$2,789,517
Total Funding to Date—$2,789,517

Current Active Organization and Contract Number

1. Massachusetts Institute of Technology
   Cambridge, Massachusetts —HC-65226

Cardiovascular Health Study (CHS), Initiated in Fiscal Year 1988

The CHS is a population-based, longitudinal study of risk factors for development and progression of CHD and stroke in elderly adults. Extensive data and samples have been collected from nearly 6,000 participants since 1989–1990. The objective for the current CHS: Transition Phase is to enhance use of the data and samples by the scientific community during a transition period from a contract-funded, NHLBI-directed program to one directed by a steering committee of investigators with independent research support. Seventeen percent of the participants are from minority populations.

Obligations

Funding History:
Fiscal Year 2006—$930,000
Fiscal Years 1988–2005—$75,886,177
Total Funding to Date—$76,816,177

Current Active Organizations and Contract Numbers

1. University of Washington
   Seattle, Washington —HC-55222

Coronary Artery Risk Development in Young Adults (CARDIA), Initiated in Fiscal Year 1984

CARDIA is a long-term study examining the evolution of CVD risk factors in a cohort of black and white adults, aged 18 to 30 years in 1985–1986. The study examines risk for heart and lung disease and diabetes by collecting information on body composition, physical activity and lifestyle, genetics, serologic and metabolic components, inflammatory markers, and other subclinical markers of disease. Fifty percent of the participants are black.

Obligations

Funding History:
Fiscal Year 2006—$6,881,765
Fiscal Years 1984–2005—$71,838,396
Total Funding to Date—$78,720,161

Current Active Organizations and Contract Numbers

1. New England Medical Center
   Hospitals, Inc.
   Boston, Massachusetts —HC-45204
2. Wake Forest University Health Sciences
   Winston-Salem, North Carolina —HC-45205
3. University of Alabama at Birmingham
   Birmingham, Alabama —HC-48047
4. University of Minnesota, Twin Cities
   Minneapolis, Minnesota —HC-48048
5. Northwestern University
   Chicago, Illinois —HC-48049
6. Kaiser Permanente Division of Research
   Oakland, California —HC-48050
7. University of Alabama at Birmingham
   Birmingham, Alabama —HC-95095

DNA Resequencing and Genotyping, Initiated in Fiscal Year 2004

The purpose of this program is to obtain rapid, reliable, and cost-efficient DNA sequencing and genotyping of candidate genomic regions potentially important in the disease pathways of heart, lung, and blood diseases and sleep disorders. This information will assist ongoing investigations of genetic components involved in the causes, variable outcome, and progression of the diseases and disorders.

Obligations

Funding History:
Fiscal Year 2006—$7,000,000
Fiscal Year 2004-2005—$11,000,000
Total Funding to Date—$18,000,000

Current Active Organizations and Contract Numbers

1. Constella Group, Inc.
   Bethesda, Maryland —HV-48193
2. University of Washington
   Seattle, Washington —HV-48194
3. Johns Hopkins University
   Baltimore, Maryland —HV-48195
4. Center for the Advancement of Genetics, Inc.
   Rockville, Maryland —HV-48196

Framingham Heart Study

The orginal Framingham Heart Study was designed as a longitudinal investigation of constitutional and environmental factors influencing the development of CVD in individuals free of these conditions at the outset. Of the original 5,209 subjects, about 500 members remain alive. In 1971, the Framingham Offspring Study was initiated to assess familial and genetic factors associated with CHD. More than 5,000 offspring (and their spouses) were included. A third-generation cohort consisting of 3,500 grandchildren has been added to permit examination of numerous hypotheses about the genetic contribution to CVD and CVD risk factors. Additional goals include identifying new risk factors for cardiovascular, lung, and blood diseases and developing new imaging tests that can detect very early stages of coronary atherosclerosis in otherwise healthy adults.

Obligations

Funding History:
Fiscal Year 2006—$10,907,043
Fiscal Years 1983–2005—$62,166,638
Total Funding to Date—$73,073,681

Current Active Organization and Contract Number

1. Boston University Medical Center
   Boston, Massachusetts —HC-25195

Genetically Triggered Thoracic Aortic Aneurysms and Other Cardiovascular Conditions (GENTAC): National Registry, Initiated in Fiscal Year 2006

The purpose of this program is to establish a national registry to enable investigators to determine the best medical practices to advance the clinical management of genetic thoracic aortic aneurysms and other cardiovascular complications associated with connective tissue diseases such as Marfan Syndrome.

Obligations

Funding History:
Fiscal Year 2006—$1,391,748
Total Funding to Date—$1,391,748

Current Active Organization and Contract Number

1. Research Triangle Institute
   Research Triangle Park, North Carolina —HV-68199

Hispanic Community Health Study (HCHS), Initiated in Fiscal Year 2006

The purpose of this study is to identify risk factors for cardiovascular and lung diseases in Hispanic populations living in the United States and determine the role of acculturation in their development and prevalence. The program will support a multicenter, 6.5-year epidemiologic study comprising approximately 16,000 participants of Hispanic origin (4,000 at each of 4 sites), aged 18 to 74 years.

Obligations

Funding History:
Fiscal Year 2006—$2,900,000
Total Funding to Date—$2,900,000

Current Active Organizations and Contract Numbers

1. University of North Carolina at Chapel Hill
   Chapel Hill, North Carolina —HC-65233
2. University of Miami
   Miami, Florida —HC-65234
3. Albert Einstein College of Medicine
   New York, New York —HC-65235
4. Northwestern University
   Chicago, Illinois —HC-65236
5. San Diego State University
   San Diego, California —HC-65237

Jackson Heart Study (JHS), Initiated in Fiscal Year 1998

The JHS is a single-site epidemiologic study of CVD in blacks, similar to established studies in Framingham, Massachusetts, and Honolulu, Hawaii, with primary goals of identifying risk factors for development and progression of CVD; enhancing recruitment, cohort retention, and scientific productivity of the existing Jackson site of the ARIC study; building research capabilities at minority institutions; developing partnerships between minority and majority institutions; and expanding minority investigator participation in large-scale epidemiologic studies.

Obligations

Funding History:
Fiscal Year 2006—$3,535,576
Fiscal Years 1998–2005—$20,219,989
Total Funding to Date—$23,755,565

Current Active Organizations and Contract Numbers

1. Jackson State University
   Jackson, Mississippi —HC-95170
2. Mississippi Medical Center
   Jackson, Mississippi —HC-95171
3. Tougaloo College
   Tougaloo, Mississippi —HC-95172

Multi-Ethnic Study of Atherosclerosis (MESA), Initiated in Fiscal Year 1999

The purpose of this study is to investigate the prevalence, correlates, and progression of subclinical CVD, i.e., disease detected noninvasively before it has produced clinical signs and symptoms, in a population that is 38 percent white, 28 percent black, 22 percent Hispanic, and 12 percent Asian.

Obligations

Funding History:
Fiscal Year 2006—$8,563,705
Fiscal Years 1999–2005—$54,269,999
Total Funding to Date—$62,833,704

Current Active Organizations and Contract Numbers

1. University of Washington
   Seattle, Washington —HC-95159
2. University of California, Los Angeles
   Los Angeles, California —HC-95160
3. Columbia University
   New York, New York —HC-95161
4. Johns Hopkins University
   Baltimore, Maryland —HC-95162
5. University of Minnesota, Twin Cities
   Minneapolis, Minnesota —HC-95163
6. Northwestern University
   Chicago, Illinois —HC-95164
7. Wake Forest University
   Winston-Salem, North Carolina —HC-95165
8. University of Vermont
   Colchester, Vermont —HC-95166
9. New England Medical Center
   Boston, Massachusetts —HC-95167
10. Johns Hopkins University
    Baltimore, Maryland —HC-95168
11. Harbor-UCLA Research and Education Institute
    Los Angeles, California —HC-95169

Pediatric Circulatory Support, Initiated in Fiscal Year 2004

The purpose of this program is to establish multidisciplinary teams to develop innovative circulatory assist devices or other bioengineered systems for infants and children with congenital and acquired CVD who experience cardiopulmonary failure and circulatory collapse.

Obligations

Funding History:
Fiscal Year 2006—$5,959,141
Fiscal Year 2004–2005—$8,581,202
Total Funding to Date—$14,540,343

Current Active Organizations and Contract Numbers

1. Cleveland Clinic Lerner College of Medicine
   Cleveland, Ohio —HV-48188
2. Ension, Inc.
   Pittsburgh, Pennsylvania —HV-48189
3. Jarvik Heart, Inc.
   New York, New York —HV-48190
4. Pennsylvania State University
   Hershey, Pennsylvania —HV-48191
5. University of Pittsburgh
   Pittsburgh, Pennsylvania —HV-48192

Proteomics Initiative, Initiated in Fiscal Year 2002

The purpose of this program is to establish highly interactive, multidisciplinary centers to enhance and develop innovative proteomic technologies directed

to relevant biologic questions associated with heart, lung, blood, and sleep health and disease. Scientists will focus on the cells' protein machinery directed toward understanding the molecular basis of the causes and progression of heart, lung, and blood diseases and sleep disorders and identifying targets for therapeutic interventions.

Obligations

Funding History:
Fiscal Year 2006—$18,740,000
Fiscal Years 2002–2005—$78,893,890
Total Funding to Date—$97,633,890

Current Active Organizations and Contract Numbers

1. Boston University
   Boston, Massachusetts —HV-28178
2. Institute for Systems Biology
   Seattle, Washington —HV-28179
3. Johns Hopkins University
   Baltimore, Maryland —HV-28180
4. Medical University of South Carolina
   Charleston, South Carolina —HV-28181
5. Medical College of Wisconsin
   Milwaukee, Wisconsin —HV-28182
6. Stanford University
   Stanford, California —HV-28183
7. University of Texas
   Galveston, Texas —HV-28184
8. University of Texas
   Southwestern Medical Center
   Dallas, Texas —HV-28185
9. Yale University
   New Haven, Connecticut —HV-28186
10. Henry M. Jackson Foundation for the
    Advancement of Military Medicine, Inc.
    Rockville, Maryland —HV-28187

Registry for Mechanical Circulatory Support, Initiated in Fiscal Year 2005

The purpose of this program is to establish a data and clinical coordinating center to manage a registry of patients receiving a mechanical circulatory support device (MCSD) to treat heart failure. The registry will collect and analyze clinical and laboratory data and tissue samples from patients who receive MCSDs as destination therapy for end-stage heart failure at 60 to 70 participating hospitals.

Obligations

Funding History:
Fiscal Year 2006—$1,585,877
Fiscal Year 2005—$1,215,702
Total Funding to Date—$2,801,579

Current Active Organization and Contract Number

1. University of Alabama
   Birmingham, Alabama —HV-58198

SNP Health Association Resource (SHARE), Initiated in Fiscal Year 2006

The purpose of this program is to identify genetic variants associated with heart, lung, and blood diseases and sleep disorders through application of large-scale, single nucleotide polymorphism (SNP) genotyping for genome-wide association analyses. In collaboration with the National Center for Biotechnology Information, the Institute is developing a public-use data resource to integrate genome-wide genotypic information with phenotypic information from multiple NHLBI studies.

Obligations

Funding History:
Fiscal Year 2006—$2,000,000
Total Funding to Date—$2,000,000

Current Active Organization and Contract Number

1. Affymetrix, Inc.
   Santa Clara, California —HL-64278

Translational Behavioral Science Research Consortium, Initiated in Fiscal Year 2002

The purpose of this program is to establish a consortium of interdisciplinary basic and applied social scientists to conduct research related to developing and testing theories from the behavioral or social sciences concerning cognitive, affective, motivational, developmental, and other factors and processes underlying human behavior. Acquired knowledge will be used to develop and test methods to encourage individuals to adopt and maintain a healthy lifestyle and manage behavioral risk factors for heart, lung, and blood diseases and sleep disorders.

Obligations

Funding History:
Fiscal Year 2006—$0
Fiscal Years 2002–2005—$20,430,569
Total Funding to Date—$20,430,569

Current Active Organizations and Contract Numbers

1. Weill Medical College of Cornell University
New York, New York —HC-25196
2. Mount Sinai School of Medicine
New York, New York —HC-25197

Lung Diseases Program

Lung Tissue Research Consortium, Initiated in Fiscal Year 2004

The purpose of this program is to establish a consortium for collecting lung tissues and preparing and distributing them for research. Scientists seek to improve management of lung diseases by increasing understanding of the pathogenetic mechanisms of lung diseases through molecular histopathological studies on tissues with and without disease. Primary emphases are on COPD and idiopathic pulmonary fibrosis.

Obligations

Funding History:
Fiscal Year 2006—$12,598,812
Fiscal Year 2004–2005—$10,499,994
Total Funding to Date—$23,098,806

Current Active Organizations and Contract Numbers

1. Mayo Clinic College of Medicine
Rochester, New York —HR-46158
2. University of Colorado Health Science Center
Denver, Colorado —HR-46159
3. University of Colorado Health Science Center
Denver, Colorado —HR-46160
4. Mayo Clinic College of Medicine
Rochester, New York —HR-46161
5. University of Michigan
Ann Arbor, Michigan —HR-46162
6. University of Pittsburgh
Pittsburgh, Pennsylvania —HR-46163
7. Clinical Trials and Survey Corporation
Baltimore, Maryland —HR-46164

Tuberculosis Curriculum Coordinating Center, Initiated in Fiscal Year 2003

The purpose of this program is to establish a consortium of five Tuberculosis Curriculum Centers to strengthen and increase access to the best ongoing educational and training opportunities in TB for medical, nursing, and allied health schools, especially those that provide primary care to communities where TB is endemic and the population is at high risk.

Obligations

Funding History:
Fiscal Year 2006—$1,125,000
Fiscal Years 2003–2005—$3,750,000
Total Funding to Date—$4,875,000

Current Active Organization and Contract Number

1. University of California, San Diego
La Jolla, California —HR-36157

Blood Diseases and Resources Program

Iron Overload and Hereditary Hemochromatosis, Initiated in Fiscal Year 2000

The purpose of this program is to determine the prevalence; genetic and environmental determinants; and potential clinical, personal, and societal impact of iron overload and hereditary hemochromatosis in a multicenter, multiethnic, primary care-based sample of 100,000 adults. Information derived from the study will be used to determine the feasibility and potential individual and public health benefits and risks of primary care-based screening and intervention for iron overload and hereditary hemochromatosis.

Obligations

Funding History:
Fiscal Year 2006—$469,227
Fiscal Year 2000–2005—$25,979,773
Total Funding to Date—$26,449,000

Current Active Organizations and Contract Numbers

1. University of Minnesota
Minneapolis, Minnesota —HC-05185
2. University of Alabama at Birmingham
Birmingham, Alabama —HC-05188
3. London Health Science
London, Canada —HC-05191
4. Wake Forest University
Winston-Salem, North Carolina —HC-05192

Maintenance of Animals for Hepatitis or AIDS Research, Initiated in Fiscal Year 1992

The purpose of this program is to maintain an NHLBI chimpanzee colony that can be used in experiments with transfusion-transmitted infectious agents (hepatitis C virus (HCB), hepatitis B virus (HBV), and HIV) for which the chimpanzee is the only known animal model.

Obligations

Funding History:
Fiscal Year 2006—$160,474
Fiscal Year 1992–2005—$8,805,530
Total Funding to Date—$8,966,004

Current Active Organization and Contract Number

1. Southwest Foundation for Biomedical Research
   San Antonio, Texas —HB-27091

Maintenance of NHLBI Biological Specimen Repository, Initiated in Fiscal Year 1998

The purpose of this project is to establish an NHLBI Biological Specimen Repository for blood specimens from Institute-supported research. The Repository monitors storage, labeling, and testing of the specimens, as well as administers safe shipment of precise sample aliquots to approved investigators for future studies.

Obligations

Funding History:
Fiscal Year 2006—$1,031,572
Fiscal Years 1998–2005—$6,594,342
Total Funding to Date—$7,625,914

Current Active Organization and Contract Number

1. BBI-Biotech Research Laboratories, Inc.
   Gaithersburg, Maryland —HB-87144

Production of Recombinant B19 Parvovirus Capsids, Initiated in Fiscal Year 1998

The purpose of this program is to manufacture clinical-grade recombinant protein Parvovirus B19 vaccine for use in a Phase I/II clinical trial to be conducted by the NHLBI.

Obligations

Funding History:
Fiscal Year 2006—$666,950
Fiscal Year 1998–2005—$2,483,750
Total Funding to Date—$3,150,700

Current Active Organization and Contract Number

1. Viral Antigens, Inc.
   Memphis, Tennessee —HB-37167

Retrovirus Epidemiology Donor Study (REDS), Initiated in Fiscal Year 1989

The purpose of this study is to conduct epidemiologic, laboratory, and survey research on volunteer blood donors within the United States to ensure the safety and availability of the blood supply. The studies will examine the risks of transfusion-transmissible infections, their trends, and ways to reduce infection risks; HIV, HTLV, HCV, and HBV test screening methodologies; donor characteristics, behaviors, and donation return patterns of U.S. blood donors; and the effectiveness and safety of various strategies to increase the U.S. blood supply.

Obligations

Funding History:
Fiscal Year 2006—$8,955,049
Fiscal Years 1989–2005—$86,865,125
Total Funding to Date—$95,820,174

Current Active Organizations and Contract Numbers

1. Blood Center of Southeastern Wisconsin
   Milwaukee, Wisconsin —HB-47168
2. Emory University
   Atlanta, Georgia —HB-47170
3. Institute for Transfusion Medicine
   Pittsburgh, Pennsylvania —HB-47172
4. Westat, Inc.
   Rockville, Maryland —HB-47175
5. Blood System Research, Inc.
   San Francisco, California —HB-57181

Sickle Cell Disease Health-Related Quality of Life Questionnaire, Initiated in Fiscal Year 2005

The purpose of this project is to develop a psychometrically sound and clinically useful health-related quality-of-life instrument and related materials for use in sickle cell clinical trials and outcomes research among adults with SCD, and to assist researchers who are early users of the instrument and materials.

Obligations

Funding History:
Fiscal Year 2006—$708,000
Fiscal Year 2005—$584,008
Total Funding To Date—$1,292,008

Current Active Organization and Contract Number

1. American Institutes for Research
   Health Program
   Silver Spring, Maryland —HL-54264

Somatic Cell Therapy Processing Facilities, Initiated in Fiscal Year 2003

This program is designed to develop novel somatic cellular therapies in areas ranging from basic science through animal studies to proof-of-principle and eventually human trials for heart, lung, and blood diseases and sleep disorders. The goal is to provide rapid, safe translation of basic research ideas into clinical practice.

Obligations

Funding History:
Fiscal Year 2006—$6,139,526
Fiscal Years 2003–2005—$15,576,209
Total Funding to Date—$21,715,735

Current Active Organizations and Contract Numbers

1. Baylor College of Medicine
   Houston, Texas —HB-37163
2. University of Minnesota, Twin Cities
   Minneapolis, Minnesota —HB-37164
3. University of Pittsburgh
   Pittsburgh, Pennsylvania —HB-37165
4. The EMMES Corporation
   Rockville, Maryland —HB-37166

11. Clinical Trials

A clinical trial is defined as a scientific research study undertaken with human subjects to evaluate prospectively the diagnostic, prophylactic, or therapeutic effect of a drug, device, regimen, or procedure used or intended ultimately for use in the practice of medicine or the prevention of disease. A clinical trial is planned and conducted prospectively and includes a concurrent control group or other appropriate comparison group.

NHLBI Investigator-Initiated Clinical Trials: Fiscal Years 1996–2006

Research Grants and Cooperative Agreements (Dollars in Thousands)

	Fiscal Year										
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Heart and Vascular Diseases											
Program on Surgical Control of Hyperlipidemias (POSCH)	$ 566	$ 294	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Emory Angioplasty Versus Surgery Trial (EAST)	296	—	—	—	—	—	—	—	—	—	—
Asymptomatic Carotid Artery Plaque Study (ACAPS)	70	—	—	—	—	—	—	—	—	—	—
Infant Heart Surgery: Central Nervous System Sequelae of Circulatory Arrest	699	685	582	584	392	75	—	—	—	—	—
Multicenter Unsustained Tachycardia Trial*	504	—	—	—	—	—	—	—	—	—	—
Women's Health Study (WHS)	1,434	1,473	1,536	1,530	1,594	—	—	—	—	889	—
Cardiovascular Risk Factors and the Menopause	478	494	528	186	—	—	—	—	—	—	—
CABG Patch Trial*	988	1,171	—	—	—	—	—	—	—	—	—
Women's Antioxidant and Cardiovascular Study (WACS)	643	501	525	540	556	572	598	592	599	670	—
Oral Calcium in Pregnant Women With Hypertension	320	332	—	—	—	—	—	—	—	—	—
Stress Reduction and Atherosclerotic CVD in Blacks	403	407	40	326	339	360	376	394	—	—	—
Enalapril After Anthracycline Cardiotoxicity	707	724	789	—	—	—	—	—	—	—	—
Stress and Anger Management for Blacks With Hypertension	241	250	—	—	—	—	—	—	—	—	—
Estrogen Replacement and Atherosclerosis (ERA) Trial*	1,213	965	1,668	1,017	—	—	—	—	—	—	—
Shock Trial: Should We Emergently Revascularize Occluded Coronaries for Cardiogenic Shock?	1,008	826	874	—	440	362	298	291	296	—	—
HDL-Atherosclerosis Treatment Study	427	445	340	—	326	—	—	—	—	—	—
Influence of Cardiopulmonary Bypass (CPB) Temperature on CABG Morbidity	118	—	—	—	—	—	—	—	—	—	—
Women's Estrogen/Progestin Lipid Lowering Hormone Atherosclerosis Regression Trial (WELL-HART)*	508	1,196	1,269	1,131	—	32	—	—	—	—	—
Mode Selection Trial in Sinus Node Dysfunction (MOST)*	1,857	2,096	1,700	2,879	1,136	154	—	—	—	—	—
Antioxidants and Prevention of Early Atherosclerosis*	240	603	—	—	—	—	—	—	—	—	—

* Paid by U01/U10.

NHLBI Investigator-Initiated Clinical Trials: Fiscal Years 1996–2006 (continued)

	Research Grants and Cooperative Agreements (Dollars in Thousands)										
	Fiscal Year										
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Heart and Vascular Diseases (continued)											
Postmenopausal Hormone Therapy in Unstable Angina	258	264	271	276	—	—	—	—	—	—	—
Estrogen and Graft Atherosclerosis Research Trial (EAGER)*	476	488	305	—	361	371	—	—	—	—	—
Soy Estrogen Alternative Study (SEA)	219	217	221	—	—	—	—	—	—	—	—
REMATCH Trial*	—	1,258	1,798	1,333	825	750	—	—	—	—	—
Dietary Patterns, Sodium Intake, and Blood Pressure (DASH Sodium)*†	—	2,233	3,693	3,646	1,247	151	387	376	395	—	—
Sudden Cardiac Death in Heart Failure Trial (SCD-HeFT)*	—	1,571	1,667	1,709	1,698	1,798	1,412	1,930	—	—	—
CVD Risk and Health in Post-Menopausal Phytoestrogen Users	—	631	662	574	244	—	304	152	—	—	—
Treatment of Hypertension With Two Exercise Intensities	—	359	474	473	481	420	—	—	—	—	—
Prevention of Recurrent Venous Thromboembolism (PREVENT)	—	—	1,242	894	521	543	1,272	—	—	—	—
PREMIER: Lifestyle Interventions for Blood Pressure Control*	—	—	2,234	3,425	3,595	2,925	1,505	—	—	—	—
Azithromycin and Coronary Events Study (ACES)*	—	—	847	2,663	2,182	720	1,254	1,137	—	—	—
Antiarrhythmic Effects of N-3 Fatty Acids	—	—	—	514	542	529	647	—	—	—	—
Fatty Acid Antiarrhythmia Trial (FAAT)	—	—	—	519	605	—	—	—	—	—	—
Occluded Artery Trial (OAT)*	—	—	—	4,892	5,079	2,604	1,724	1,963	—	—	963
Bypass Angioplasty Revascularization Investigation in Type 2 Diabetics (BARI 2D)*	—	—	—	—	3,942	6,515	9,342	8,189	8,265	8,304	8,592
Hematocrit Strategy in Infant Heart Surgery*	—	—	—	—	473	557	596	590	492	—	—
Angiotensin-II Blockade in Mitral Regurgitation	—	—	—	—	—	553	610	629	500	—	—
Heart Failure Adherence and Retention Trial (HART)	—	—	—	—	—	795	1,617	1,453	1,174	861	740
Reduction of Triglycerides in Women on HRT	—	—	—	—	—	708	746	555	544	721	—
Women's Ischemia Syndrome Evaluation (WISE)*†	—	—	—	—	—	1,502	1,506	1,306	1,303	996	—
ACE Inhibition and Novel Cardiovascular Risk Factors	—	—	—	—	—	—	694	656	602	—	—
Heart Failure: A Controlled Trial Investigating Outcomes of Exercise (HF-ACTION)*	—	—	—	—	—	—	7,471	9,582	7,973	4,483	4,590
Clinical Trial of Dietary Protein on Blood Pressure	—	—	—	—	—	—	655	610	612	504	500
Home Automatic External Defibrillator Trial (HAT)*	—	—	—	—	—	—	3,567	5,433	4,264	1,801	2,115
Perioperative Interventional Neuroprotection Trial (POINT)	—	—	—	—	—	—	553	553	562	572	378

* Paid by U01/U10.
† Previously an Institute-Initiated Clinical Trial.

NHLBI Investigator-Initiated Clinical Trials: Fiscal Years 1996–2006 (continued)

Research Grants and Cooperative Agreements (Dollars in Thousands)

	Fiscal Year										
	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Heart and Vascular Diseases (continued)											
Stop Atherosclerosis in Native Diabetics Study (SANDS)*	—	—	—	—	—	—	2,410	2,165	2,107	2,324	2,074
Surgical Treatment for Ischemic Heart Failure (STICH)*	—	—	—	—	—	—	5,709	4,495	1,613	6,082	5,583
Girls Health Enrichment Multisite Studies (GEMS)*	—	—	—	—	—	—	—	2,461	2,400	2,370	1,950
Treatment of Depression Following Bypass Surgery	—	—	—	—	—	—	—	964	1,132	1,181	1,193
Weight Loss Maintenance (WLM)*	—	—	—	—	—	—	—	3,687	4,368	3,099	4,015
Cardiovascular Outcomes in Renal Atherosclerotic Lesions (CORAL)*	—	—	—	—	—	—	—	—	4,343	5,610	4,884
FREEDOM Trial: Future Revascularization Evaluation in Patients With Diabetes Mellitus: Optional Management of Multivessel Disease	—	—	—	—	—	—	—	—	3,663	4,669	—
IMMEDIATE Trial: Immediate Myocardial Metabolic Enhancement During Initial Assessment and Treatment in Emergency Care*	—	—	—	—	—	—	—	—	5,170	9,514	10,966
AIM HIGH: Niacin Plus Statin To Prevent Vascular Events*	—	—	—	—	—	—	—	—	—	663	6,324
Claudication: Exercise Versus Endoluminal Revascularization (CLEVER)*	—	—	—	—	—	—	—	—	—	1,368	1,478
Intervention To Control Obesity in College	—	—	—	—	—	—	—	—	—	—	677
PACEmaker and Beta-Blocker Therapy Post-Myocardial Infarction (PACE-MI)	—	—	—	—	—	—	—	—	—	—	1,300
Subtotal, Heart and Vascular Diseases	13,673	19,483	23,265	29,111	26,578	22,996	45,253	50,163	52,377	56,681	58,312
Lung Diseases											
Inhaled Beclomethasone To Prevent Chronic Lung Disease*	551	436	—	—	—	—	—	—	—	—	—
Lung Health Study II*†	3,183	3,508	980	—	—	—	—	—	—	—	—
Lung Health Study III*†	—	—	1,997	1,986	1,616	1,672	927	—	—	—	—
Asthma Clinical Research Network (ACRN)*†	—	—	4,934	5,399	5,686	5,705	5,863	—	—	—	—
Fetal Tracheal Occlusion for Severe Diaphragmatic Hernia*	—	—	—	419	429	181	—	—	—	—	—
Scleroderma Lung Study*	—	—	—	1,040	1,501	1,761	1,501	1,055	—	—	71
Inhaled Nitric Oxide for Prevention of Chronic Lung Disease*	—	—	—	—	1,959	1,803	1,764	1,442	1,245	—	—
Inhaled Nitric Oxide in Prevention of Chronic Lung Disease*	—	—	—	—	1,548	1,742	1,839	1,604	903	—	—
Prospective Investigation of Pulmonary Embolism Diagnosis II (PIOPED II)*	—	—	—	—	2,190	3,667	3,388	472	—	—	—
Randomized Trial To Reduce ETS in Children With Asthma	—	—	—	—	555	545	468	277	—	—	—

* Paid by U01/U10.
† Previously an Institute-Initiated Clinical Trial.

NHLBI Investigator-Initiated Clinical Trials: Fiscal Years 1996–2006 (continued)

Research Grants and Cooperative Agreements (Dollars in Thousands)

	Fiscal Year										
	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Lung Diseases (continued)											
Apnea Positive Pressure Long-Term Efficacy Study (APPLES)*	—	—	—	—	—	—	3,224	3,021	3,110	3,188	—
Childhood Asthma Management Program-Continuation Study (CAMP-CS)/Phase 2*†	—	—	—	—	—	—	—	1,489	2,043	2,623	2,750
Clinical Trial of Acid Reflux Therapy in Asthma*	—	—	—	—	—	—	—	736	783	791	773
Impact of CPAP on Functional Outcomes in Milder Obstructive Sleep Apnea (CATNAP)	—	—	—	—	—	—	—	682	612	608	694
Outcomes of Sleep Disorders in Older Men	—	—	—	—	—	—	—	4,163	4,262	1,390	1,142
Supplemental Selenium and Vitamin E and Pulmonary Function	—	—	—	—	—	—	—	698	610	630	605
Improving Asthma Care in Minority Children in Head Start	—	—	—	—	—	—	—	—	721	826	1,004
Adenotonsillectomy for Childhood Sleep Apnea	—	—	—	—	—	—	—	—	—	—	2,255
Subtotal, Lung Diseases	3,734	3,944	7,911	8,844	15,484	17,076	18,974	15,639	14,289	10,056	9,294
Blood Diseases and Resources											
Trial To Reduce Alloimmunization to Platelets (TRAP)—Extension†	263	—	—	—	—	—	—	—	—	—	—
Stroke Prevention in Sickle Cell Anemia (STOP)*	2,435	2,584	2,036	—	293	—	—	—	—	—	—
Pediatric Hydroxyurea in Sickle Cell Anemia (PED HUG)	260	270	—	—	—	—	—	—	—	—	—
Stroke Prevention in Sickle Cell Anemia (STOP 2)*	—	—	—	—	4,200	3,166	3,168	2,320	2,366	—	—
Induction of Stable Chimerism for Sickle Cell Anemia	—	—	—	—	—	489	525	527	551	—	—
Sibling Donor Cord Blood Banking and Transplantation	—	—	—	—	—	1,222	1,224	1,286	1,353	—	—
FOCUS	—	—	—	—	—	—	—	1,639	1,796	2,923	2,446
Stroke With Transfusions Changing to Hydroxyurea (SWITCH)*	—	—	—	—	—	—	—	—	—	3,345	3,932
Subtotal, Blood Diseases and Resources	2,958	2,854	2,036	—	4,493	4,877	4,917	5,772	6,066	6,268	6,378
Total, NHLBI	**$20,365**	**$26,281**	**$33,212**	**$37,955**	**$46,555**	**$44,949**	**$69,144**	**$71,574**	**$82,220**	**$73,005**	**$73,984**

* Paid by U01/U10.

† Previously an Institute-Initiated Clinical Trial.NHLBI Investigator-Initiated Clinical Trials.

NHLBI Investigator-Initiated Phase III Clinical Trials, Fiscal Year 2006: Summary by Program

	Total Obligations Prior to FY 2006	FY 2006 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
AIM HIGH: Niacin Plus Statin To Prevent Vascular Events*	$ 663,376	$ 6,323,911	$ 6,987,287
Bypass Angioplasty Revascularization Investigation in Type 2 Diabetics (BARI 2D)*	44,558,208	8,591,820	53,150,028
Cardiovascular Outcomes in Renal Atherosclerotic Lesions (CORAL)*	9,953,424	4,884,074	14,837,498
Claudication: Exercise Versus Endoluminal Revascularization (CLEVER)	1,368,413	1,478,581	2,846,994
Clinical Trial of Dietary Protein on Blood Pressure	2,381,223	500,047	2,881,270
FREEDOM Trial: Future Revascularization Evaluation in Patients With Diabetes Mellitus: Optimal Management of Multivessel Disease	8,332,457	—	8,332,457
Girls Health Enrichment Multisite Studies*	7,230,952	1,950,186	9,181,138
Heart Failure: A Controlled Trial Investigating Outcomes of Exercise Training*	29,509,092	4,590,429	34,099,521
Heart Failure Adherence and Retention Trial (HART)	5,900,058	739,763	6,639,821
Home Automatic External Defibrillator Trial (HAT)*	15,064,384	2,114,588	17,178,972
IMMEDIATE Trial: Immediate Myocardial Metabolic Enhancement During Initial Assessment and Treatment in Emergency Care*	14,684,147	10,966,492	25,650,639
Interventions to Control Obesity in College	—	667,082	667,082
Occluded Artery Trial (OAT)	16,261,456	963,058	17,224,514
PACEmaker and Beta-Blocker Therapy Post-Myocardial Infarction (PACE-MI)	—	1,300,000	1,300,000
Perioperative Interventional Neuroprotection Trial (POINT)	2,240,021	377,720	2,617,741
Reduction of Triglycerides in Women on HRT	3,275,109	—	3,275,109
Stop Atherosclerosis in Native Diabetics Study (SANDS)*	9,004,979	2,074,057	11,079,036
Surgical Treatment for Ischemic Heart Failure (STICH)*	17,899,276	5,583,045	23,482,321
Treatment of Depression Following Bypass Surgery	3,276,909	1,192,794	4,469,703
Weight Loss Maintenance (WLM)*	11,153,382	4,014,660	15,168,042
Women's Health Study (WHS)	16,922,647	—	16,922,647
Women's Ischemia Syndrome Evaluation (WISE)*	6,613,113	—	6,613,113
Subtotal, Heart and Vascular Diseases	226,292,626	58,312,307	284,604,933
Lung Diseases			
Acid Reflux Therapy in Asthma*	2,310,686	772,866	3,083,552
Adentonsillectomy for Childhood Sleep Apnea*	—	2,254,440	2,254,440
APPLES: Apnea Positive Pressure Long-Term Efficacy Study*	12,542,181	—	12,542,181
Childhood Asthma Management Program II (CAMP II)*†	6,155,523	2,750,045	8,905,568
Impact of CPAP on Functional Outcomes in Milder Obstructive Sleep Apnea (CATNAP)	1,902,104	694,178	2,596,282
Improving Asthma Care for Minority Children in Head Start	1,547,135	1,004,355	2,551,490
Outcomes of Sleep Disorders in Older Men	9,814,166	1,142,218	10,956,384
Scleroderma Lung Study	6,857,221	71,079	6,928,300
Supplemental Selenium and Vitamin E and Pulmonary Function	1,938,311	604,383	2,542,694
Subtotal, Lung Diseases	43,067,327	9,293,564	52,360,891
Blood Diseases and Resources			
FOCUS*	6,357,932	2,446,287	8,804,219
Stroke With Transfusions Changing to Hydroxyurea (SWITCH)*	3,345,345	3,931,995	7,277,340
Subtotal, Blood Diseases and Resources	9,703,277	6,378,282	16,081,559
Total, NHLBI	**$255,944,553**	**$73,984,153**	**$329,928,706**

* Paid by U01/U10.
† Previously an Institute-Initiated Clinical Trial.

Institute-Initiated Clinical Trials: Fiscal Years 1996–2006

Contracts

	Dollars (Thousands)										
	Fiscal Year										
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Heart and Vascular Diseases											
Lipid Research Clinics	$ 660	$ 650	$ 685	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Raynaud's Treatment Study	221	19	—	—	—	—	—	—	—	—	—
Antiarrhythmic vs. Implantable Defibrillator (AVID)	2,475	—	871	548	—	—	—	—	—	—	—
Antihypertensive and Lipid-Lowering Treatment To Prevent Heart Attack Trial (ALLHAT)	9,676	15,943	17,119	—	6,259	7,000	3,980	2,761	3,346	—	—
Activity Counseling Trial (ACT)	—	2,167	2,439	—	—	—	—	—	—	—	—
Postmenopausal Estrogen/Progestin Interventions (PEPI)	—	3	170	—	—	—	—	—	—	—	—
Enhancing Recovery in Coronary Heart Disease Patients (ENRICHD)	6,993	6,837	5,904	3,303	3,487	596	425	70	—	—	—
Atrial Fibrillation Follow-Up: Investigation in Rhythm Management (AFFIRM)	2,510	6,330	—	3,785	1,239	2,401	802	—	—	—	—
Beta-Blocker Evaluation Survival Trial (BEST)	1,435	2,300	2,448	—	—	—	—	—	—	—	—
Women's Angiographic Vitamin and Estrogen Trial (WAVE)	731	2,891	1,917	3,878	886	756	—	32	—	—	—
Women's Ischemia Syndrome Evaluation (WISE)	1,577	133	2,932	856	1,424	10	50	—	—	—	—
Prevention of Events With Angiotensin Converting Enzyme Inhibitor Therapy (PEACE)	3,632	2,838	2,836	2,850	5,988	—	2,849	558	—	—	—
Magnesium in Coronaries (MAGIC)	—	—	1,169	2,009	1,243	—	238	—	—	—	—
Evaluation Study of Congestive Heart Failure and Pulmonary Artery Catheterization Effectiveness (ESCAPE)	—	—	—	1,750	1,820	—	1,129	—	—	—	311
Action To Control Cardiovascular Risk in Diabetes (ACCORD)	—	—	—	4,130	6,590	—	1,750	18,521	33,779	26,126	—
Public Access Defibrillation (PAD) Community Trial	—	—	—	2,923	2,414	3,058	1,101	—	—	—	—
Trial of Aldosterone Antagonist Therapy in Adults With Preserved Ejection Fraction Congestive Heart Failure (TOPCAT)	—	—	—	—	—	—	—	—	837	5,162	5,480
Subtotal, Heart and Vascular Diseases	29,910	40,111	38,490	26,032	31,350	13,821	12,324	21,942	37,962	31,288	5,791
Lung Diseases											
Lung Health Study I	350	—	—	—	—	—	—	—	—	—	—
Pediatric Pulmonary and Cardiac Complications of HIV Infection (P2C2)	4,033	668	1,979	—	315	—	113	—	—	—	—
Childhood Asthma Management Program (CAMP)	7,977	5,695	—	6,551	729	1,330	2,786	2,287	1,475	599	—

Institute-Initiated Clinical Trials: Fiscal Years 1996–2006

Contracts (continued)

	Fiscal Year										
	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Acute Respiratory Distress Syndrome Clinical Network (ARDSNET)	4,337	4,510	4,880	6,837	5,587	2,667	1,502	4,402	5,517	4,707	7,396
National Emphysema Treatment Trial (NETT)	—	2,710	3,367	7,545	4,047	6,989	7,910	1,630	1,648	357	—
Feasibility of Retinoid Treatment in Emphysema (FORTE)	—	—	—	884	7,711	—	2,429	725	507	185	—
Subtotal, Lung Diseases	16,697	13,583	10,226	21,817	18,389	10,986	14,740	9,044	9,147	5,848	7,396
Blood Diseases and Resources											
Clinical Course of Sickle Cell Disease	376	205	2,144	350	106	—	—	—	—	—	—
Anti-HIV Immunoglobulin (HIVIG) in Prevention of Maternal-Fetal HIV Transmission	706	—	—	—	—	—	—	—	—	—	—
T-Cell Depletion in Unrelated Donor Marrow Transplantation	1,461	639	2,228	690	1,085	1,144	557	774	164	—	—
Viral Activation Transfusion Study (VATS)	5,647	2,353	1,668	—	339	—	—	—	—	—	—
Cord Blood Stem Cell Transplantation Study (COBLT)	1,419	6,573	12,530	1,456	5,122	1,846	2,166	588	707	822	—
Multicenter Study of Hydroxyurea (MSH) in Sickle Cell Anemia Adult Follow-Up	703	472	475	469	—	—	588	994	1,136	1,340	—
Pediatric Hydroxyurea Phase III Clinical Trial (BABY HUG)	—	—	—	—	1,606	405	3,100	1,112	1,964	1,526	891
Sildenafil for Sickle Cell Disease-Associated Pulmonary Hypertension	—	—	—	—	—	—	—	—	—	—	1,867
Subtotal, Blood Diseases and Resources	10,312	10,242	19,045	2,965	8,258	3,395	6,411	3,468	3,971	3,688	2,758
Women's Health Initiative											
Subtotal, Women's Health Initiative	—	—	—	59,100	57,700	59,200	59,010	63,222	57,483	37,826	12,124
Total, NHLBI Clinical Trials Contracts	**$56,919**	**$63,936**	**$67,761**	**$109,914**	**$115,697**	**$87,402**	**$92,485**	**$97,676**	**$108,563**	**$78,650**	**$28,069**

Institute-Initiated Clinical Trials: Fiscal Years 1996–2006 (continued)

Cooperative Agreements

	Dollars (Thousands)										
	Fiscal Year										
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Heart and Vascular Diseases											
Trials of Hypertension Prevention (TOHP)	$ 649	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Dietary Intervention Study in Children (DISC)	1,625	746	—	—	—	—	—	—	—	—	—
Bypass Angioplasty Revascularization Investigation (BARI)	2,757	2,894	1,360	1,609	1,634	1,549	1,456	—	—	—	—
Postmenopausal Estrogen/ Progestin Interventions (PEPI)	331	—	—	—	—	—	—	—	—	—	—
Child and Adolescent Trial for Cardiovascular Health (CATCH)	2,682	3,956	572	210	—	—	—	—	—	—	—
Dietary Effects on Lipoproteins and Thrombogenic Activity (DELTA)	132	290	—	—	—	—	—	—	—	—	—
Obesity Prevention in Young American Indians (PATHWAYS)	3,432	4,119	3,945	4,196	2,459	—	—	—	—	—	—
Dietary Approaches To Stop Hypertension (DASH)	899	—	—	—	—	—	—	—	—	—	—
Rapid Early Action for Coronary Treatment (REACT)	4,992	2,866	496	—	—	—	—	—	—	—	—
Girls Health Enrichment Multisite Studies (GEMS)	—	—	—	2,282	2,365	2,877	2,713	—	—	—	—
Trial of Activity for Adolescent Girls (TAAG)	—	—	—	—	5,274	4,831	5,919	5,828	6,350	5,103	905
Pediatric Cardiovascular Clinical Research Network	—	—	—	—	—	3,447	4,822	5,381	4,948	3,992	—
Clinical Research Consortium To Improve Resuscitation Outcome	—	—	—	—	—	—	—	—	6,886	9,339	9,728
Dynamic Assessment of Patient-Reported Chronic Disease Outcomes	—	—	—	—	—	—	—	—	1,010	—	—
Clinical Trials in Organ Transplantation (CTOT)	—	—	—	—	—	—	—	—	—	1,900	1,855
Pediatric Heart Network	—	—	—	—	—	—	—	—	—	—	6,988
Heart Failure Clinical Research Network	—	—	—	—	—	—	—	—	—	—	5,642

Institute-Initiated Clinical Trials: Fiscal Years 1996–2006 (continued)

Cooperative Agreements (continued)

	Dollars (Thousands)										
	Fiscal Year										
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Heart and Vascular Diseases (continued)											
Weight Loss in Obese Adults With CVD Risk Factors	—	—	—	—	—	—	—	—	—	—	2,567
NICHD Cooperative Multicenter Neonatal Research Network	—	—	—	—	—	—	—	—	—	—	1,336
Pediatric HIV/AIDS Cohort Study (PHACS)—Data and Operations Center	—	—	—	—	—	—	—	—	—	—	1,000
Subtotal, Heart and Vascular Diseases	17,499	14,871	6,373	8,297	11,732	12,704	14,910	11,209	19,194	20,334	30,021
Lung Diseases											
Asthma Clinical Research Network (ACRN)*	4,526	4,479	—	—	—	—	—	8,181	8,424	8,667	7,839
Asthma and Pregnancy Studies	1,000	913	—	—	—	—	—	—	—	—	—
Childhood Asthma Research and Education (CARE) Network	—	—	—	4,175	5,002	5,314	6,005	5,610	5,292	5,704	5,735
COPD Clinical Research Network	—	—	—	—	—	—	—	6,843	6,848	8,438	7,664
Idiopathic Pulmonary Fibrosis Clinical Research Network	—	—	—	—	—	—	—	—	—	3,486	7,349
Subtotal, Lung Diseases	5,526	5,392	—	4,175	5,002	5,314	6,005	20,634	20,564	26,295	28,587
Blood Diseases and Resources											
Thalassemia (Cooley's Anemia) Clinical Research Network	—	—	—	—	2,192	2,219	2,269	2,320	2,375	2,730	2,682
Blood and Marrow Transplant Clinical Research Network	—	—	—	—	—	5,360	5,899	5,950	5,972	6,460	6,845
Transfusion Medicine/ Hemostasis Clinical Research Network	—	—	—	—	—	—	6,053	6,241	6,093	6,221	6,521
Sickle Cell Disease Clinical Research Network	—	—	—	—	—	—	—	—	—	—	3,761
Subtotal, Blood Diseases and Resources	—	—	—	—	2,192	7,579	14,221	14,511	14,440	15,411	19,809
Total, NHLBI-Initiated Clinical Trials, Cooperative Agreements	**$23,025**	**$20,263**	**$6,373**	**$12,472**	**$18,926**	**$25,597**	**$35,136**	**$46,354**	**$54,198**	**$62,040**	**$78,417**
Total, NHLBI-Initiated Clinical Trials	**$79,944**	**$84,199**	**$74,134**	**$122,386**	**$134,623**	**$112,999**	**$127,621**	**$144,030**	**$162,761**	**$140,690**	**$106,486**

* Investigator-Initiated From 1998 to 2002.

Institute-Initiated Clinical Trials, Fiscal Year 2006: Summary by Program

Contracts

	Total Obligations Prior to FY 2006	Total FY 2006 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Action To Control Cardiovascular Risk in Diabetes (ACCORD)	$ 90,895,802	$ —	$ 90,895,802
Evaluation Study of Congestive Heart Failure and Pulmonary Artery Catheterization Effectiveness (ESCAPE)	4,699,537	311,000	5,010,537
Trial of Aldosterone Antagonists Therapy in Adults With Ejection Fraction Congestive Heart Failure (TOPCAT)	5,998,973	5,479,690	11,478,663
Subtotal, Heart and Vascular Diseases	101,594,312	5,790,690	107,385,002
Lung Diseases			
Acute Respiratory Distress Syndrome Clinical Network (ARDSNET)	50,915,641	7,396,064	58,311,705
Subtotal, Lung Diseases	50,915,641	7,396,064	58,311,705
Blood Diseases and Resources			
Pediatric Hydroxyurea Phase III Clinical Trial (BABY HUG)	9,713,399	891,000	10,604,399
Sildenafil for Sickle Cell Disease-Associated Pulmonary Hypertension	—	1,867,000	1,867,000
Subtotal, Blood Diseases and Resources	9,713,399	2,758,000	12,471,399
Women's Health Initiative			
Subtotal, Women's Health Initiative	710,441,494	12,124,061	722,565,555
Total, NHLBI-Initiated Clinical Trials, Contracts	**$872,664,846**	**$28,068,815**	**$900,733,661**

Cooperative Agreements

	Total Obligations Prior to FY 2006	Total FY 2006 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Clinical Research Consortium To Improve Resuscitation Outcome	$ 16,224,715	$ 9,728,012	$ 25,952,727
Clinical Trials in Organ Transplantation (CTOT)	1,900,000	1,855,350	3,755,350
Dynamic Assessment of Patient-Reported Chronic Disease Outcomes	1,009,694	—	1,009,694
Heart Failure Clinical Research Network	—	5,642,461	5,642,461
NICHD Cooperative Multicenter Neonatal Research Network	—	1,336,159	1,336,159
Pediatric Heart Network	—	6,988,223	6,988,223
PHACS—Data and Operations Center	—	1,000,000	1,000,000
Trial of Activity for Adolescent Girls (TAAG)	33,305,766	905,336	34,211,102
Weight Loss in Obese Adults With CVD Risk Factors	—	2,567,146	2,567,146
Subtotal, Heart and Vascular Diseases	52,440,175	30,022,687	82,462,862
Lung Diseases			
Asthma Clinical Research Network (ACRN), Phase II	25,272,584	7,838,310	33,110,894
Childhood Asthma Research and Education (CARE) Network	37,102,539	5,734,754	42,837,293
COPD Clinical Research Network	22,129,545	7,664,383	29,793,928
Idiopathic Pulmonary Fibrosis Clinical Research Network	3,486,226	7,349,196	10,835,422
Subtotal, Lung Diseases	87,990,894	28,586,643	116,577,537
Blood Diseases and Resources			
Blood and Marrow Transplant Clinical Research Network	29,641,551	6,845,170	36,486,721
Sickle Cell Disease Clinical Research Network	—	3,761,385	3,761,385
Thalassemia (Cooley's Anemia) Clinical Research Network	14,104,677	2,682,493	16,787,170
Transfusion Medicine/Hemostasis Clinical Research Network	24,607,616	6,520,638	31,128,254
Subtotal, Blood Diseases and Resources	68,353,844	19,809,686	88,163,530
Total, NHLBI-Initiated Clinical Trials, Cooperative Agreements	**$ 208,784,913**	**$ 78,419,016**	**$ 287,203,929**
Total, NHLBI-Initiated Clinical Trials	**$1,087,626,685**	**$106,487,831**	**$1,194,114,516**

Heart and Vascular Diseases Program

Action To Control Cardiovascular Risk in Diabetes (ACCORD), Initiated in Fiscal Year 1999

The purpose of this study is to evaluate three diabetic treatment strategies (intensive glycemic control, blood pressure control, and fibrate treatment to raise HDL-cholesterol and lower triglycerides) to prevent major cardiovascular events in patients with type 2 diabetes mellitus. The primary outcome measure is CVD mortality or major morbidity (MI and stroke). A vanguard phase of about 1,000 participants was completed in FY 2002, and the main trial proceeded in FY 2003.

Obligations

Funding History:
Fiscal Year 2006—$0
Fiscal Years 1999–2005—$90,895,802
Total Funding to Date—$90,895,802

Current Active Organizations and Contract Numbers

1. Veterans Affairs Medical Center, Albuquerque
   Albuquerque, New Mexico —HC-10100
2. Veterans Affairs Medical Center, Memphis
   Memphis, Tennessee —HC-90350
3. Wake Forest University
   Winston-Salem, North Carolina —HC-95178
4. McMaster University
   Hamilton, Ontario —HC-95179
5. University of Washington
   Seattle, Washington —HC-95180
6. Case Western Reserve University
   Cleveland, Ohio —HC-95181
7. Wake Forest University
   Winston-Salem, North Carolina —HC-95182
8. Minneapolis Medical Research Foundation
   Minneapolis, Minnesota —HC-95183
9. Trustees of Columbia University of New York
   New York, New York —HC-95184

Clinical Research Consortium To Improve Resuscitation Outcomes, Initiated in Fiscal Year 2004

The purpose of this study is to establish a resuscitation research consortium to conduct research in cardiopulmonary arrest and traumatic injury leading to arrest. The consortium will facilitate the rapid translation of promising scientific and clinical advances to improve resuscitation outcomes.

Obligations

Funding History:
Fiscal Year 2006—$9,728,012
Fiscal Year 2004–2005—$16,224,715
Total Funding to Date—$25,952,727

Current Active Organizations and Grant Numbers

1. University of Washington
   Seattle, Washington —HL-077863
2. University of Iowa
   Iowa, City, Iowa —HL-077865
3. Medical College of Wisconsin
   Milwaukee, Wisconsin —HL-077866
4. University of Washington
   Seattle, Washington —HL-077867
5. University of Pittsburgh
   Pittsburgh, Pennsylvania —HL-077871
6. St. Michael's Hospital
   Toronto, Ontario —HL-077872
7. Oregon Health and Science University
   Portland, Oregon —HL-077873
8. University of Alabama at Birmingham
   Birmingham, Alabama —HL-077881
9. Ottawa Health Research Institute
   Ottawa, Ontario —HL-077885
10. University of Texas
    Southwestern Medical Center
    Dallas, Texas —HL-077887
11. University of California, San Diego
    La Jolla, California —HL-077908

Clinical Trials in Organ Transplantation (CTOT), Initiated in Fiscal Year 2005

The purpose of this program is to support a multisite consortium for interventional or observational clinical studies to enhance our understanding of, and ultimately reduce, the immune-mediated morbidity and mortality of organ transplantation.

Obligations

Funding History:
Fiscal Year 2006—$1,855,350
Fiscal Year 2005—$1,900,000
Total Funding to Date—$3,755,350

Current Active Organizations and Contract Numbers

1. University of Pennsylvania
   Philadelphia, Pennsylvania —AI-063589
2. Mount Sinai School of Medicine
   New York, New York —AI-063594
3. Brigham and Women's Hospital
   Boston, Massachusetts —AI-063623

Dynamic Assessment of Patient-Reported Chronic Disease Outcomes, Initiated in Fiscal Year 2004

The purpose of this study, which emanates from a NIH Roadmap Initiative, is to develop a computerized system of patient-reported outcomes that will meet the needs of clinical researchers across a wide variety of chronic disorders and diseases. Investigators will develop and test a large bank of items measuring patient-reported outcomes; create a computerized adaptive testing system that will allow for efficient assessment of patient-reported outcomes in clinical research; and create a publicly available system that can be added to and modified periodically for clinical researchers.

Obligations

Funding History:
Fiscal Year 2006—$0
Fiscal Year 2004–2005—$1,009,694
Total Funding to Date—$1,009,694

Current Active Organizations and Grant Numbers

1. University of Pittsburgh
   Pittsburgh, Pennsylvania —AR-052155
2. Stanford University
   Stanford, California —AR-052158
3. State University New York, Stony Brook
   Stony Brook, New York —AR-052170
4. University of Washington
   Seattle, Washington —AR-052171
5. Evanston Northwestern Healthcare
   Evanston, Illinois —AR-052177
6. University of North Carolina at Chapel Hill
   Chapel Hill, North Carolina —AR-052181
7. Duke University
   Durham, North Carolina —AR-052186

Evaluation Study of Congestive Heart Failure and Pulmonary Artery Catheterization Effectiveness (ESCAPE), Initiated in Fiscal Year 1999

The purpose of this study is to compare the efficacy of pulmonary artery catheterization-directed (PAC) treatment strategy to a noninvasive treatment strategy on morbidity and mortality in patients with severe congestive heart failure. Forty-two percent of the participants are black. Results of the trial presented in November 2004 showed that PAC did not increase or decrease death or the number of days hospitalized in patients with severe heart failure. Follow-up studies are comparing the quality of life, ability to exercise, and changes in the heart's structure and function as measured by echocardiograms between the groups.

Obligations:

Funding History:
Fiscal Year 2006—$311,000
Fiscal Year 1999–2005—$4,699,537
Total Funding to Date—$5,010,537

Current Active Organization and Grant Number

1. Duke University
   Durham, North Carolina —HV-98177

Heart Failure Clinical Research Network, Initiated in Fiscal Year 2006

The purpose of this network is to accelerate research in the diagnosis and management of heart failure in order to improve outcomes through optimal application of existing therapies and evaluation of novel therapies. The network will provide the necessary infrastructure to develop, coordinate, and conduct multiple collaborative clinical protocols to facilitate application of emerging basic science discoveries into clinical investigations.

Obligations:

Funding History:
Fiscal Year 2006—$5,642,461
Total Funding to Date—$5,642,461

Current Active Organizations and Grant Numbers

1. Minneapolis Medical Research Foundation, Inc.
   Minneapolis, Minnesota —HL-084861
2. Duke University
   Durham, North Carolina —HL-084875

3. Brigham and Women's Hospital
Boston, Massachusetts —HL-084877
4. University of Utah
Salt Lake City, Utah —HL-084889
5. Baylor College of Medicine
Houston, Texas —HL-084890
6. University of Vermont and State Agriculture College
Burlington, Vermont —HL-084899
7. Duke University
Durham, North Carolina —HL-084904
8. Mayo Clinic College of Medicine
Rochester, Minnesota —HL-084907
9. Montreal Heart Institute
Montreal Quebec, Canada —HL-084931

NICHD Cooperative Multicenter Neonatal Research Network, Initiated in Fiscal Year 2006

The purpose of this network is to investigate the safety and efficacy of treatment and management strategies to care for newborn infants, particularly those related to management of low birth weight infants. The objective of this program is to facilitate evaluation of the strategies by establishing a network of academic centers that, by rigorous patient evaluation using common protocols, can study the required numbers of patients and can provide answers more rapidly than individual centers acting alone.

Obligations:

Funding History:
Fiscal Year 2006—$1,336,159
Total Funding to Date—$1,336,159

Current Active Organizations and Grant Numbers

1. Case Western Reserve University
Cleveland, Ohio —HD-021364
2. University of Texas Health Science Center
Houston, Texas —HD-021373
3. Wayne State University
Detroit, Michigan —HD-021385
4. Emory University
Atlanta, Georgia —HD-027851
5. Children's Hospital Medical Center
Cincinnati, Ohio —HD-027853
6. Indiana University-Purdue University at Indianapolis
Indianapolis, Indiana —HD-027856
7. Yale University
New Haven, Connecticut —HD-027871
8. Stanford University
Stanford, California —HD-027880
9. Women and Infants Hospital
Providence, Rhode Island —HD-027904
10. University of Alabama at Birmingham
Birmingham, Alabama —HD-034216
11. Duke University
Durham, North Carolina —HD-040492
12. University of Texas Southwestern Medical Center
Dallas, Texas —HD-040689
13. University of New Mexico
Albuquerque, New Mexico —HD-053089
14. University of Iowa
Iowa City, Iowa —HD-053109
15. New England Medical Center Hospitals
Boston, Massachusetts —HD-053119
16. University of Utah
Salt Lake City, Utah —HD-053124

Pediatric Heart Network, Initiated in Fiscal Year 2006

The objective of this study is to establish a clinical network to evaluate novel treatment methods and management strategies for children with structural congenital heart disease, inflammatory heart disease, heart muscle disease, or arrhythmias.

Obligations

Funding History:
Fiscal Year 2006—$6,988,223
Total Funding to Date—$6,988,223

Current Active Organizations and Grant Numbers

1. Duke University
Durham, North Carolina —HL-068269
2. New England Research Institute, Inc.
Watertown, Massachusetts —HL-068270
3. Children's Hospital of Philadelphia
Philadelphia, Pennsylvania —HL-068279
4. Medical University of South Carolina
Charleston, South Carolina —HL-068281
5. Children's Hospital
Boston, Massachusetts —HL-068285
6. Hospital for Sick Children
Toronto, Ontario —HL-068288
7. Columbia University Health Sciences
New York, New York —HL-068290
8. University of Utah
Salt Lake City, Utah —HL-068292

9. Children's Hospital Medical Center
   Cincinnati, Ohio —HL-085057

Pediatric HIV/AID Cohort Study (PHACS)—Data and Operations Center, Initiated in Fiscal Year 2006

The purpose of this study is to create a body of data to understand more fully the effect of HIV on sexual maturation, pubertal development, and socialization of perinatally HIV-infected preadolescents and adolescents, and to acquire more definitive information regarding long-term safety of antiretroviral agents when used during pregnancy and in newborns.

Obligations:

Funding History:
Fiscal Year 2006—$1,000,000
Total Funding to Date—$1,000,000

Current Active Organization and Grant Number

1. Harvard University
   Boston, Massachusetts —HD-052102

Trial of Activity for Adolescent Girls (TAAG), Initiated in Fiscal Year 2000

The purpose of this community-based study is to test the effects of a school–community-linked intervention to prevent decline in physical activity and cardiorespiratory fitness seen during adolescence in girls. The study is being conducted in 36 schools; 43 percent of the population are minorities.

Obligations

Funding History:
Fiscal Year 2006—$905,336
Fiscal Years 2000–2005—$33,305,766
Total Funding to Date—$34,211,102

Current Active Organizations and Grant Numbers

1. University of Minnesota, Twin Cities
   Minneapolis, Minnesota —HL-066845
2. University of South Carolina
   Columbia, South Carolina —HL-066852
3. University of North Carolina at Chapel Hill
   Chapel Hill, North Carolina —HL-066853
4. Tulane University
   New Orleans, Louisiana —HL-066855
5. San Diego State University
   San Diego, California —HL-066856
6. Johns Hopkins University
   Baltimore, Maryland —HL-066857
7. University of Arizona
   Tucson, Arizona —HL-066858

Trial of Aldosterone Antagonists in Adults With Preserved Ejection Fraction Congestive Heart Failure, (TOPCAT) Initiated in Fiscal Year 2004

The purpose of this study is to evaluate the effectiveness of aldosterone antagonist therapy to reduce mortality in patients who have heart failure with preserved systolic function.

Obligations

Funding History:
Fiscal Year 2006—$5,479,690
Fiscal Year 2004–2005—$5,998,973
Total Funding to Date—$11,478,663

Current Active Organization and Contract Number

1. New England Research Institutes, Inc.
   Watertown, Massachusetts —HC-45207

Weight Loss in Obese Adults With Cardiovascular Risk Factors, Initiated in Fiscal Year 2006

The purpose of this study is to conduct randomized clinical trials in routine clinical practice settings to test the effectiveness of weight loss interventions in obese patients who have one or more additional cardiovascular risk factors. An important secondary focus of these effectiveness clinical trials is to incorporate the weight loss strategies with approaches to improve application of evidence-based guidelines to reduce the other cardiovascular risk factors commonly present in obese patients, such as elevated lipids, hypertension, metabolic syndrome, diabetes, or cigarette smoking.

Obligations:

Funding History:
Fiscal Year 2006—$2,567,146
Total Funding to Date—$2,567,146

Current Active Organizations and Grant Numbers

1. Brigham and Women's Hospital
   Boston, Massachusetts —HL-087071

2. University of Pennsylvania
Philadelphia, Pennsylvania —HL-087072
3. Johns Hopkins University
Baltimore, Maryland —HL-087085

Lung Diseases Program

Acute Respiratory Distress Syndrome Clinical Network (ARDSNet), Initiated in Fiscal Year 1994

The purpose of this network is to develop and conduct randomized controlled clinical trials to prevent, treat, and improve the outcome of patients with acute lung injury, ARDS, and other related critical illnesses.

Obligations

Funding History:
Fiscal Year 2006—$7,396,064
Fiscal Years 1994–2005—$50,915,641
Total Funding to Date—$58,311,705

Current Active Organizations and Contract Numbers

1. Baystate Medical Center
Springfield, Massachusetts —HR-56165
2. University of California, San Francisco
San Francisco, California —HR-56166
3. University of Colorado Health Sciences Center
Denver, Colorado —HR-56167
4. Cleveland Clinic Lerner College of Medicine-Case Western Reserve University
Cleveland, Ohio —HR-56168
5. Duke University Medical Center
Durham, North Carolina —HR-56169
6. John Hopkins University
Baltimore, Maryland —HR-56170
7. HC Health Services, Inc.
Salt Lake City, Utah —HR-56171
8. Louisiana State University
New Orleans, Louisiana —HR-56172
9. University of Washington
Seattle, Washington —HR-56173
10. Vanderbilt University Medical Center
Nashville, Tennessee —HR-56174
11. Wake Forest University Health Sciences
Winston-Salem, North Carolina —HR-56175
12. Mayo Clinic College of Medicine
Rochester, Minnesota —HR-56176
13. Massachusetts General Hospital
Boston, Massachusetts —HR-56179

Asthma Clinical Research Network (ACRN), Phase II, Initiated in Fiscal Year 2003

The purpose of this network is to evaluate current and novel therapies and management strategies for adult asthma and to ensure that findings are rapidly disseminated to the medical community. Approximately 33 percent of the participants will be minorities.

Obligations

Funding History:
Fiscal Year 2006—$7,838,310
Fiscal Years 2003–2005—$25,272,584
Total Funding to Date—$33,110,894

Current Active Organizations and Grant Numbers

1. National Jewish Medical and Research Center
Denver, Colorado —HL-074073
2. University of California, San Francisco
San Francisco, California —HL-074204
3. University of Texas Medical Branch
Galveston, Texas —HL-074206
4. Washington University
St. Louis, Missouri —HL-074208
5. University of Wisconsin
Madison, Wisconsin —HL-074212
6. University of California, San Diego
La Jolla, California —HL-074218
7. Wake Forest University Health Sciences
Winston-Salem, North Carolina —HL-074225
8. Brigham and Women's Hospital
Boston, Massachusetts —HL-074227
9. Pennsylvania State University Hershey Medical Center
Hershey, Pennsylvania —HL-074231

Childhood Asthma Research and Education (CARE) Network, Initiated in Fiscal Year 1999

The purpose of this clinical network is to evaluate current and novel therapies and management strategies for children with asthma. Emphasis is on clinical trials that help identify optimal therapy for children with different asthma phenotypes, genotypes, and ethnic backgrounds and children at different developmental stages.

Obligations

Funding History:
Fiscal Year 2006—$5,734,754
Fiscal Years 1999–2005—$37,102,539
Total Funding to Date—$42,837,293

Current Active Organizations and Grant Numbers

1. Washington University
   St. Louis, Missouri —HL-064287
2. National Jewish Medical and
   Research Center
   Denver, Colorado —HL-064288
3. University of California, San Diego
   La Jolla, California —HL-064295
4. University of Wisconsin
   Madison, Wisconsin —HL-064305
5. University of Arizona
   Tucson, Arizona —HL-064307
6. Pennsylvania State University
   Hershey, Pennsylvania —HL-064313

COPD Clinical Research Network, Initiated in Fiscal Year 2003

The purpose of this network is to investigate disease management approaches in patients with moderate-to-severe COPD and to ensure that the findings are rapidly disseminated to the medical community.

Obligations

Funding History:
Fiscal Year 2006—$7,664,383
Fiscal Years 2003–2005—$22,129,545
Total Funding to Date—$29,793,928

Current Active Organizations and Grant Numbers

1. Harbor-UCLA Research
   and Education Institute
   Torrance, California —HL-074407
2. Temple University
   Philadelphia, Pennsylvania —HL-074408
3. Denver Health and Hospital Authority
   Denver, Colorado —HL-074409
4. Minnesota Veterans Research Institute
   Minneapolis, Minnesota —HL-074416
5. University of Alabama at Birmingham
   Birmingham, Alabama —HL-074418
6. University of Michigan at Ann Arbor
   Ann Arbor, Michigan —HL-074422
7. University of Minnesota, Twin Cities
   Minneapolis, Minnesota —HL-074424
8. Brigham and Women's Hospital
   Boston, Massachusetts —HL-074428
9. University of California, San Francisco
   San Francisco, California —HL-074431
10. University of Pittsburgh
    Pittsburgh, Pennsylvania —HL-074439
11. University of Maryland
    Baltimore Professional School
    Baltimore, Maryland —HL-074441

Idiopathic Pulmonary Fibrosis Clinical Research Network, Initiated in Fiscal Year 2005

The purpose of this network is to establish (1) six to seven clinical centers to design and perform multiple therapeutic trials for treatment of patients with newly diagnosed idiopatic pulmonary fibrosis and (2) a Data Coordinating Center for the network.

Obligations

Funding History:
Fiscal Year 2006—$7,349,196
Fiscal Year 2005—$3,486,226
Total Funding to Date—$10,835,422

Current Active Organizations and Contract Numbers

1. Mayo Clinic College of Medicine
   Rochester, Minnesota —HL-080274
2. Vanderbilt University
   Nashville, Tennessee —HL-080370
3. University of Michigan at Ann Arbor
   Ann Arbor, Michigan —HL-080371
4. Weill Medical College of Cornell University
   New York, New York —HL-080383
5. University of California, Los Angeles
   Los Angeles, California —HL-080411
6. Duke University
   Durham, North Carolina —HL-080413
7. University of Washington
   Seattle, Washington —HL-080509
8. Tulane University of Louisiana
   New Orleans, Louisiana —HL-080510
9. University of Chicago
   Chicago, Illinois —HL-080513
10. Emory University
    Atlanta Geogia —HL-080543
11. National Jewish Medical
    and Research Center
    Denver Colorado —HL-080571
12. University of California, San Francisco
    San Francisco, California —HL-080685

Blood Diseases and Resources Program

Blood and Marrow Transplant Clinical Research Network, Initiated in Fiscal Year 2001

The purpose of this network is to promote the efficient comparison of novel treatment methods and man-

agement strategies of potential benefit for children and adults undergoing blood or marrow transplantation.

Obligations

Funding History:
Fiscal Year 2006—$6,845,170
Fiscal Years 2001–2005—$29,641,551
Total Funding to Date—$36,486,721

Current Active Organizations and Grant Numbers

1. University of Nebraska Medical Center
   Omaha, Nebraska —HL-069233
2. Fred Hutchinson Cancer
   Research Center
   Seattle, Washington —HL-069246
3. Dana Farber Cancer Institute
   Boston, Massachusetts —HL-069249
4. Children's Mercy Hospital
   Kansas City, Missouri —HL-069254
5. University of California, San Diego
   La Jolla, California —HL-069273
6. Duke University
   Durham, North Carolina —HL-069274
7. City of Hope Medical Center
   Duarte, California —HL-069278
8. University of Pennsylvania
   Philadelphia, Pennsylvania —HL-069286
9. University of Minnesota, Twin Cities
   Minneapolis, Minnesota —HL-069290
10. Stanford University
    Stanford, California —HL-069291
11. Medical College of Wisconsin
    Milwaukee, Wisconsin —HL-069294
12. University of Florida
    Gainesville, Florida —HL-069301
13. Johns Hopkins University
    Baltimore, Maryland —HL-069310
14. Sloan Kettering Institute
    for Cancer Research
    New York, New York —HL-069315
15. University of Michigan at Ann Arbor
    Ann Arbor, Michigan —HL-069330
16. Case Western Reserve University
    Cleveland, Ohio —HL-069348

Pediatric Hydroxyurea Phase III Clinical Trial (BABY HUG), Initiated in Fiscal Year 2000

The objective of this clinical trial is to determine if hydroxyurea therapy is effective in prevention of chronic end organ damage in pediatric patients with sickle cell anemia.

Obligations

Funding History:
Fiscal Year 2006—$891,000
Fiscal Years 2000–2005—$9,713,399
Total Funding to Date—$10,604,399

Current Active Organizations and Contract Numbers

1. Children's Research Institute
   Washington, DC —HB-07150
2. Duke University Medical Center
   Durham, North Carolina —HB-07151
3. Howard University
   Washington, DC —HB-07152
4. Johns Hopkins University
   Baltimore, Maryland —HB-07153
5. Medical University of South Carolina
   Charleston, South Carolina —HB-07154
6. St. Jude Children's Research Hospital
   Memphis, Tennessee —HB-07155
7. The Research Foundation of SUNY
   New York, New York —HB-07156
8. University of Miami
   Miami, Florida —HB-07157
9. University of Mississippi Medical Center
   Jackson, Mississippi —HB-07158
10. University of Texas
    Southwestern Medical Center
    Dallas, Texas —HB-07159
11. Clinical Trials and Surveys Corporation
    Baltimore, Maryland —HB-07160

Sickle Cell Disease Clinical Research Network, Initiated in Fiscal Year 2006

The purpose of this clinical research network is to conduct Phase III randomized controlled clinical trials to test the efficacy and effectiveness of new therapies to treat and prevent complications of SCD, and when appropriate, thalassemia. In addition, the network is designed to create data sets that can be used to improve characterization of patients and their clinical course, apply genomic and proteomic techniques for improved diagnostic and therapeutic approaches, and expand the clinical application of multimodal therapies in SCD.

Obligations:

Funding History:
Fiscal Year 2006—$3,761,385
Total Funding to Date—$3,761,385

Current Active Organizations and Contract Numbers

1. Duke University
   Durham, North Carolina —HL-083698
2. Emory University
   Atlanta, Georgia —HL-083699
3. Children's Hospital and Research Center
   Oakland, California —HL-083704
4. Drexel University
   Philadelphia, Pennsylvania —HL-083705
5. New England Research Institutes, Inc.
   Watertown, Massachusetts —HL-083721
6. University of Illinois at Chicago
   Chicago, Illinois —HL-083730
7. Virginia Commonwealth University
   Richmond, Virginia —HL-083732
8. Children's Hospital of Philadelphia
   Philadelphia, Pennsylvania —HL-083746
9. Howard University
   Washington, DC —HL-083748
10. Boston Medical Center
    Boston, Massachusetts —HL-083771

Sildenafil for Sickle Cell Disease-Associated Pulmonary Hypertension, Initiated in Fiscal Year 2006

The purpose of this clinical trial is to evaluate the safety and efficacy of 18 weeks of therapy with sildenafil, a nitric oxide potentiator, in adult patients with SCD and pulmonary hypertension; exercise endurance and pulmonary artery pressure will be measured. Pulmonary hypertension occurs in up to 30 percent of SCD cases and is strongly associated with mortality in adults with SCD.

Obligations:

Funding History:
Fiscal Year 2006—$1,867,000
Total Funding to Date—$1,867,000

Current Active Organizations and Contract Numbers

1. Rho Federal Systems Division, Inc.
   Chapel Hill, North Carolina —HB-67182
2. Imperial College of London
   London, England —HB-67183
3. Children's Hospital of Pittsburgh
   Pittsburgh, Pennsylvania —HB-67184
4. University of Colorado
   Denver, Colorado —HB-67185
5. Children's Hospital and Research Center at Oakland
   Oakland, California —HB-67186
6. University of Illinois at Chicago
   Chicago, Illinois —HB-67187
7. Johns Hopkins University
   Baltimore, Maryland —HB-67188
8. Howard University
   Washington, DC —HB-67189
9. Albert Einstein College of Medicine
   New York, New York —HB-67190

Thalassemia (Cooley's Anemia) Clinical Research Network, Initiated Fiscal Year 2000

The purpose of this network is to accelerate research in the management of thalassemia, standardize existing treatments, and evaluate new ones in a network of clinical centers.

Obligations

Funding History:
Fiscal Year 2006—$2,682,493
Fiscal Years 2000–2005—$14,104,677
Total Funding to Date—$16,787,170

Current Active Organizations and Grant Numbers

1. Children's Hospital of Philadelphia
   Philadelphia, Pennsylvania —HL-065232
2. Hospital for Sick Children
   Toronto, Ontario —HL-065233
3. New England Research Institute, Inc.
   Watertown, Massachusetts —HL-065238
4. Children's Hospital and Research Center at Oakland
   Oakland, California —HL-065239
5. Weill Medical College of Cornell University
   New York, New York —HL-065244
6. Children's Hospital
   Boston, Massachusetts —HL-065260

Transfusion Medicine/Hemostasis Clinical Research Network, Initiated in Fiscal Year 2002

The purpose of this network is to promote the efficient comparison of new management strategies for individuals with hemostatic disorders, such as idiopathic thrombocytopenia and thrombotic thrombocytopenic purpura, and to evaluate new and existing blood products and cytokines for treatment of hematologic disorders.

Obligations

Funding History:
Fiscal Year 2006—$6,520,638
Fiscal Years 2002–2005—$24,607,616
Total Funding to Date—$31,128,254

Current Active Organizations and Grant Numbers

1. University of Iowa
   Iowa City, Iowa —HL-072028
2. Case Western Reserve University
   Cleveland, Ohio —HL-072033
3. University of Minnesota, Twin Cities
   Minneapolis, Minnesota —HL-072072
4. Johns Hopkins University
   Baltimore, Maryland —HL-072191
5. Weill Medical College
   of Cornell University
   New York, New York —HL-072196
6. Emory University
   Atlanta, Georgia —HL-072248
7. New England Research Institutes, Inc.
   Watertown, Massachusetts —HL-072268
8. Tulane University of Louisiana
   New Orleans, Louisiana —HL-072274
9. University of Oklahoma
   Health Sciences Center
   Oklahoma City, Oklahoma —HL-072283
10. Duke University
    Durham, North Carolina —HL-072289
11. Blood Center of Southeastern Wisconsin
    Milwaukee, Wisconsin —HL-072290
12. Children's Hospital
    Boston, Massachusetts —HL-072291
13. Massachusetts General Hospital
    Boston, Massachusetts —HL-072299
14. Puget Sound Blood Center
    Seattle, Washington —HL-072305
15. University of Pittsburgh
    Pittsburgh, Pennsylvania —HL-072331
16. University of Pennsylvania
    Philadelphia, Pennsylvania —HL-072346
17. University of North Carolina
    at Chapel Hill
    Chapel Hill, North Carolina —HL-072355
18. University of Maryland
    Baltimore Professional School
    Baltimore, Maryland —HL-072359

Women's Health Initiative, Initiated in Fiscal Year 1992

The purpose of the WHI is to study cardiovascular disease, cancer, and osteoporosis in postmenopausal women. The program consists of three major components: a randomized controlled clinical trial of HRT, dietary modification, and calcium/vitamin D supplementation; an observational study to identify predictors of disease; and a study of community approaches to developing healthful behaviors.

Obligations

Funding History:
Fiscal Year 2006—$12,124,061
Fiscal Years 2000–2005*—$710,441,494
Total Funding to Date—$722,565,555

Current Active Organizations and Contract Numbers

1. Fred Hutchinson Cancer Research Center
Seattle, Washington —WH-22110
2. University of Medicine and Dentistry of New Jersey
Newark, New Jersey —WH-24152
3. Fred Hutchinson Cancer Research Center
Seattle, Washington —WH-32100
4. University of Minnesota, Twin Cities
Minneapolis, Minnesota —WH-32101
5. University of Iowa College of Medicine
Iowa City, Iowa —WH-32102
6. University of Alabama at Birmingham
Birmingham, Alabama —WH-32105
7. Wake Forest University
Winston-Salem, North Carolina —WH-32106
8. Northwestern University
Chicago, Illinois —WH-32108
9. Brigham and Women's Hospital
Boston, Massachusetts —WH-32109
10. University of Medicine and Dentistry of New Jersey
Newark, New Jersey —WH-32110
11. Emory University
Atlanta, Georgia —WH-32111
12. University of Pittsburgh
Pittsburgh, Pennsylvania —WH-32112
13. University of California, Davis
Davis, California —WH-32113
14. University of Arizona
Tucson, Arizona —WH-32115
15. University of Tennessee
Memphis, Tennessee —WH-32118
16. Memorial Hospital of Rhode Island
Pawtucket, Rhode Island —WH-32119
17. University of California, San Diego
La Jolla, California —WH-32120
18. State University of New York at Buffalo
Buffalo, New York —WH-32122
19. American College of Obstetricians and Gynecologists
Washington, DC —WH-34205
20. University of California, Irvine
Irvine, California —WH-42107
21. George Washington University
Washington, DC —WH-42108
22. Stanford University
Stanford, California —WH-42109
23. Baylor College of Medicine
Houston, Texas —WH-42110
24. University of Texas Health Science Center
San Antonio, Texas —WH-42111
25. Ohio State University
Columbus, Ohio —WH-42112
26. University of Nevada School of Medicine
Reno, Nevada —WH-42113
27. Kaiser Foundation Research Institute
Oakland, California —WH-42114
28. State University of New York at Stony Brook
Stony Brook, New York —WH-42115
29. University of Massachusetts Medical School
Worcester, Massachusetts —WH-42116
30. University of North Carolina at Chapel Hill
Chapel Hill, North Carolina —WH-42117
31. Wayne State University
Detroit, Michigan —WH-42118

* This figure reflects funding for the clinical trials and observational studies only. From 1992 to 1998, major support was provided through the Office of the Director, NIH. The Community Prevention Study receives funding through an interagency agreement with the CDC: $4,000,000 in FY 1999 and $12,000,000 from FY 1996–98.

32. Albert Einstein College of Medicine
New York, New York —WH-42119
33. Harbor-UCLA Research and Education Institute
Torrance, California —WH-42120
34. Kaiser Foundation Research Institute
Oakland, California —WH-42121
35. Medical College of Wisconsin
Milwaukee, Wisconsin —WH-42122
36. Medlantic Research Institute
Washington, DC —WH-42123
37. Rush-Presbyterian-St. Luke's Medical Center
Chicago, Illinois —WH-42124
38. University of California, Los Angeles School of Medicine
Los Angeles, California —WH-42125
39. University of Cincinnati Medical Center
Cincinnati, Ohio —WH-42126
40. University of Florida College of Medicine
Gainesville, Florida —WH-42129
41. University of Hawaii at Manoa
Honolulu, Hawaii —WH-42130
42. University of Miami
Miami, Florida —WH-42131
43. University of Wisconsin
Madison, Wisconsin —WH-42132

12. Minority Activities

Throughout its history, the NHLBI has been a leader in conducting and supporting research to eliminate health disparities that exist between various segments of the U.S. population. The Institute has not only initiated research projects with significant minority participation in order to compare health status between various populations, but also given high priority to programs that focus exclusively on minority health issues.

Since FY 1991, the Institute has had procedures in place to ensure full compliance with the NIH Policy on Inclusion of Women and Minorities as Subjects in Clinical Research. As a result, all NHLBI-supported research that involves human subjects includes minorities, with the exception of a very few projects for which a compelling justification for limited diversity in the study population exists. Thus, all segments of the population, both minority and nonminority, stand to benefit from the Institute's research programs.

It has long been a goal of the NHLBI to increase the number of individuals from underrepresented groups in biomedical and behavioral research. Selected FY 2006 activities addressing this goal include the following:

- Minority K–12 Initiative for Teachers and Students (MKITS): Supports research, development, and evaluation of innovative science training programs to provide minority students in grades K–12 with the exposure, skills, and knowledge that will encourage them to pursue advanced studies in biomedical and behavioral sciences.
- Historically Black Colleges and Universities (HBCU) Research Scientist Award: Supports efforts by HBCU to recruit an established research scientist in cardiovascular, lung, or blood health and disease; transfusion medicine; or sleep disorders.
- Sickle Cell Scholars Program: Supports career development of young or new investigators in SCD research.
- Summer for Sickle Cell Science Program: Supports research training and mentoring of individuals from high school to junior investigator level as part of the Comprehensive Sickle Cell Centers program.
- Clinical Research Education and Career Development in Minority Institutions: Encourages the development and implementation of curriculum-dependent programs in minority institutions to train selected doctoral and postdoctoral candidates in clinical research leading to a Master of Science Degree in Clinical Research or Master of Public Health Degree in a clinically relevant area.
- Research Scientist Award for Minority Institutions: Strengthens the biomedical and behavioral research capabilities and resources of minority institutions by recruiting an established scientist with expertise in areas related to cardiovascular, lung, or blood health and disease; transfusion medicine; or sleep disorders.
- Minority Undergraduate Biomedical Education Program: Encourages development of pilot demonstration programs at minority undergraduate educational institutions to recruit and retain talented undergraduate students in the biomedical sciences.
- Summer Institute Program To Increase Diversity in Health-Related Research: Enables faculty and scientists from underrepresented racial and ethnic groups or with disabilities to advance their research skills and knowledge in basic and applied sciences relevant to heart, lung, and blood diseases and sleep disorders, so that they may compete for funding for scientific research in the biomedical and behavioral sciences.

The Office of Minority Health Affairs (OMHA) within the Office of the Director provides oversight for, and coordinates, supports, and evaluates Institute programs related to minority health outcomes, including research, research training and career development, public outreach, and translation of research findings. The OMHA also coordinates activities to foster greater participation of underrepresented

minorities in NHLBI research and research training and career development programs. Selected FY 2006 activities include the following:

- Issuing four training and career development RFAs to increase the number of highly trained minorities conducting biomedical and behavioral research. Additional targeted groups include individuals from underrepresented racial and ethnic groups or disadvantaged backgrounds or individuals with disabilities.
- Participating in HHS-Endorsed Minority Organization Internship Programs by providing positions in NHLBI extramural divisions to students from the National Association for Equal Opportunity in Higher Education, the Hispanic Association of Colleges and Universities, and the Washington Internships for Native Students programs.
- Cosponsoring with the NIH, the Cherokee Elementary School Project: Out of the Box, which is designed to create awareness and interest in the importance of science, medicine, and health; eliminate gaps in quality of health among minorities by encouraging health-related careers; and encourage youngsters to take responsibility for their own health.
- Supporting the African American, Hispanic, and Native American Youth Initiatives to bring minority students to the NIH campus for scientific presentations, an introduction to NHLBI's research training and career development programs, and a tour of several NHLBI laboratories.
- Providing undergraduate students from the Tougaloo College Scholars program the opportunity to observe biomedical research at the NHLBI during a 3-day tour of the NIH that includes learning about the NIH and available research training opportunities.
- Serving as a Web site resource for recruitment of minority individuals into the Ruth L. Kirschstein Institutional National Research Service Award (T32).
- Increasing recruitment of individuals for the NHLBI intramural and extramural training programs by representing the Institute at five minority-focused research meetings to raise awareness of research and research training and career development opportunities available from the NHLBI.
- Coordinating the Biomedical Research Training Program for Individuals From Underrepresented Groups that offers opportunities for underrepresented undergraduate, postbaccalaureate, and graduate students to receive training in fundamental biomedical sciences and clinical research as it relates to the etiology and treatment of heart, blood vessel, lung, and blood diseases and sleep disorders.

See Chapter 13 for additional NHLBI-supported minority research training and career development programs.

The following text describes selected current projects that focus on minority populations and reflect the Institute's research portfolio related to minority health. Additional information can be found in Chapters 9 through 11.

Heart and Vascular Diseases

Risk Factors

Epidemiology

Long-term epidemiologic studies are critical to uncovering risk factors that lead to disease. The Institute has initiated several major studies of heart disease focused significantly or completely on minority populations.

- CARDIA (see Chapter 10): To determine the evolution of CHD risk factors and lifestyle characteristics in young adults that may influence development of risk factors prior to middle age; 50 percent of the participants are black.
- ARIC (see Chapter 10): To investigate the association of CHD risk factors with development of atherosclerosis and CVD in an adult population; 30 percent of the participants are black.
- CHS (see Chapter 10): To examine risk factors for CHD and stroke in the elderly; 16 percent of the participants are black.
- Strong Heart Study (see Chapter 9): To compare risk factor levels and morbidity and mortality from CVD among American Indians from three different geographic locations.
- JHS (see Chapter 10): To identify environmental and genetic factors influencing evolution and progression of CVD in blacks.

- MESA (see Chapter 10): To examine the characteristics of subclinical CVD that predict progression to clinically overt CVD and related risk factors that predict subclinical disease in blacks, whites, Hispanics, and Asians; 62 percent of the participants are minorities.
- GOCADAN (see Chapter 9): To document CVD risk factors and measures of subclinical disease and to identify and characterize genes that contribute to CVD in approximately 40 extended Alaska Native families.
- HCHS (see Chapter 10): To identify risk factors for cardiovascular and lung disease in Hispanic populations in the United States and determine the role of acculturation in their prevalence and development.

Several investigator-initiated epidemiologic studies are examining gene–environment interactions that increase CVD risk factors among various racial groups. Included among them are studies that compare gene–environment interactions in black populations in Africa, the Caribbean, and selected areas of the United States; determine the genes responsible for the metabolic syndrome, a risk factor for CVD, in 10,000 Chinese sibling pairs; determine the genes responsible for CVD risk factor response to dietary fat changes in blacks; investigate genes influencing changes in blood pressure in response to high- and low-salt diets in a rural Chinese population; and identify and map specific genes that contribute to CVD risk in Mexican Americans.

Scientific evidence is emerging that implicates cellular and inflammatory processes in the development and characteristics of atherosclerotic plaque and the clinical course of CVD. One study seeks to identify cellular, metabolic, and genomic correlates of atherosclerotic plaque characteristics and early changes in the vascular wall in a subset of the ARIC cohort that is predominately black. Another study is elucidating the links between socioeconomic factors, stress, inflammation and hemostasis, and cardiovascular risk in a large and diverse population.

Several drugs in four widely used classes of noncardiovascular medications (fluoroquinolone and macrolide antibiotics, antipsychotics, and antidepressants) have been shown to be pro-arrhythmic and thus increase the risk of sudden cardiac death. Investigators are conducting a study, using a large and comprehensive data set of about 800,000 persons, 40 percent blacks, to understand the role of these medications on the risk of sudden cardiac death. Research findings will provide information that clinicians need to prescribe these widely used medications in a way that minimizes the risk of sudden cardiac death.

Ancillary studies to MESA are investigating subclinical CVD in ethnic minority groups. They include investigations of regional left ventricular function, progression of calcification in the aorta, abnormalities in the small vessels of the retina, association of air pollution and subclinical CVD, identification of genes for subclinical CVD, and relationships of sociodemographic factors and other factors to subclinical CVD.

The Institute is supporting additional epidemiologic investigations that include a study of Chagas' disease—a leading cause of heart disease throughout Latin America—to identify genetic determinants of susceptibility to infection and differential disease pathogenesis in a black population residing in rural Brazil; a project to use pooled data from nine existing U.S. studies to compare between blacks and whites, CHD incidence and mortality rates, exposure–outcome relationship, patterns of comorbidity, and population attributable risk; and a study to evaluate and compare the extent of atherosclerosis and risk factors for CHD in three different populations: U.S., Japanese American in Hawaii, and Japanese in Japan.

Treatment and Prevention

Low-dose aspirin is cost effective and efficacious for the prevention and treatment of CHD. However, some individuals, perhaps because of genetic variations across individuals, do not respond to the treatment. A genetic study in high-risk siblings of patients with premature CHD, along with their adult offspring, is seeking to determine whether low-dose aspirin responsiveness is heritable and whether it is associated with specific variations in candidate genes or defined haplotypes; 50 percent of the participants are black.

Many evidence-based guidelines for treatment of risk factors or disease have been developed, but they are often not adhered to by patients—especially minority populations—or adopted in routine clinical practice. The Institute has initiated the following activities to address this important problem:

- Trials Assessing Innovative Strategies To Improve Clinical Practice Through Guidelines in Heart, Lung, and Blood Diseases: To identify obstacles to implementing national evidence-based guidelines and test interventions to promote their use in clinical practice. Studies supported by this initiative have a high percentage of minority participants.
- Overcoming Barriers to Treatment Adherence in Minorities and Persons Living in Poverty: To overcome barriers to treatment adherence for lifestyle changes and pharmacologic therapy in minorities and persons living in poverty.

Although great progress has been achieved in reducing CVD morbidity and mortality in the United States over the past 40 years, minorities have not shared fully in the progress and continue to have higher CVD morbidity. To address this problem, the Institute has initiated programs directed at reducing cardiovascular health disparities:

- Partnership Programs To Reduce Cardiovascular Disparities: To expand the capacity of research institutions to reduce health disparities, encourage more researchers to focus on minority health, and improve minority acceptance and community willingness to participate in research by pairing research-intensive medical centers that have a track record of NIH-supported research and patient care with minority health care serving institutions that lack a strong research program. Research will focus on the complex biological, behavioral, and societal factors that result in cardiovascular health disparities in their target populations (e.g., African Americans, Hispanics, Native Hawaiians, and Pacific Islanders).
- Cultural Competence and Health Disparities Academic Award: To enhance the ability of select physicians and other health care professionals to address disparities in the occurrence, management, and outcomes of cardiovascular, pulmonary, hematological, and sleep disorders among various population groups in the United States in a culturally sensitive manner. The award addresses ethnic, cultural, religious, socioeconomic, linguistic, and other factors that contribute to health disparities, and culturally competent approaches to mitigating them.
- Community-Responsive Interventions To Reduce Cardiovascular Risk in American Indians and Alaska Natives: To test the effectiveness of culturally appropriate behavioral interventions that promote adoption of healthy lifestyles related to heart disease and stroke risk, including healthy diet, regular physical activity, smoking cessation, and stress management in American Indians and Alaska Natives.

Education

The NHLBI, through its education programs (see Chapter 2), disseminates health information to physicians, health care professionals, patients, and the public on ways to prevent or treat diseases within the Institute's mandate. It has developed the following community-based programs to combat cardiovascular health disparities among four major cultural/ethnic groups: blacks, Hispanics, American Indians and Alaska Natives, and Asian Americans and Pacific Islanders.

- Public Health in Public Housing: Improving Health, Changing Lives: To disseminate information about improving cardiovascular health by adopting heart healthy lifestyles to populations residing in public housing.
- NHLBI-Health Resources and Services Administration Bureau of Primary Care Partnership: To integrate clinical care management teams and trained community health educators to implement two pilot programs for patients in public housing primary care centers who are at high risk for CVD.
- Salud para su Corazón: To disseminate information on CVD prevention, intervention, and treatment and promote heart healthy behaviors in Hispanic communities through lay health educators (promotores model).
- NHLBI-Indian Health Service Partnership To Strengthen the Heartbeat of AI/AN Communities: To develop and initiate effective approaches to improve cardiovascular health in three tribal communities; to examine and document results of the three tribal community projects completed in FY 2006; to develop and implement "Honoring the Gift of Heart Health," a national cardiovascular health training program, with the Indian Health Service; and to disseminate CVD information on prevention and education through outreach and training opportunities for AI/AN communities across the country.
- NHLBI Asian American and Pacific Islanders Heart Health Outreach Project: To develop culturally and linguistically appropriate outreach activities and information to increase community awareness of heart disease and its associated risk factors and to

promote heart healthy lifestyles among a diverse Asian American and Pacific Islander population.

In addition to the activities mentioned above, the Institute has prepared publications on CVD prevention for minority populations. They include the following:

- *Improving Cardiovascular Health in African Americans—Package of Seven Easy-To-Read Booklets*
- *Heart-Healthy Home Cooking African American Style*
- *Your Heart is Golden: Heart Health Promotion Activities for Vietnamese Communities*
- Eight Easy-to-Read Booklets in Spanish and English on Heart Health
- *Bringing Heart Health to Latinos: A Guide for Building Community Programs*
- *Your Heart, Your Life: A Health Educator's Manual* for the Latino community
- *Filipinos Aspire for Healthy Hearts Fact Sheets* in Tagalog and English
- *Filipinos Take It To Heart: A How-To Guide for Bringing Heart Health to Your Community*
- *Vietnamese Aspire for Healthy Hearts Fact Sheets* in Vietnamese and English
- *Treat Your Heart to a Healthy Celebration* directed to American Indians and Alaskan Natives
- *Honoring the Gift of Heart Health: A Heart Health Educator's Manual for Native Americans*

The educational materials listed throughout this chapter can be obtained from the NHLBI public Web site or through the NHLBI online catalog.

Arrhythmias

The NHLBI is supporting basic and genetic research on the mechanisms that underlie cardiac arrhythmias to improve diagnosis, treatment, and prevention of arrhythmias in all ethnic and racial groups in the United States. In one study examining common genetic variants that underlie variability in heart rate and rhythm, researchers have found significant ethnic and racial differences in the occurrence of sudden infant death syndrome (SIDS) associated with mutations in the same ion channel genes that cause inherited and acquired long QT syndrome (a rhythm disturbance that can be lethal). This finding, which helps to explain why SIDS occurs among blacks and Native Americans at three times its rate among whites and six times its rate among Hispanics and Asians, may lead to prospective genetic testing for SIDS and permit counseling for at-risk families.

Another study identified an association between variations in certain receptors that are activated during sympathetic nervous system stimulation and an increased risk of sudden cardiac death, most often due to ventricular arrhythmia. Although no significant differences were found between blacks and whites in associated risk of sudden cardiac death, continued research in this area can be expected to advance understanding of differences in genetic predisposition for cardiac arrhythmias among ethnic and racial groups and ultimately lead to improved therapy.

Heart Failure

Heart failure (heart muscle dysfunction) affects about 5 million Americans of all ethnicities and is a growing public health concern. It is frequently the end result of other conditions, such as hypertension, diabetes, and prior heart attacks.

The NHLBI is supporting basic and clinical research associated with heart failure that will benefit Americans of all ethnicities. One Institute-supported study within the Partnership Programs To Reduce Cardiovascular Disparities is examining heart failure disparities in Native Hawaiians:

- Heart Failure Disparities in Native Hawaiians: To characterize ethnic differences in patients hospitalized for heart failure, determine whether a culturally competent educational program can reduce hospitalizations, and compare the effectiveness of early diagnosis in high-risk patients by using community-based portable echocardiography to echocardiography performed by professional hospital-based sonographers.

Other research targeting minority populations includes an investigation of genetic variations (especially those common in blacks) that affect individual responses to the beta blocker drugs used to treat heart failure and identification of underlying genetic variations that result in familial dilated cardiomyopathy, an inherited form of heart dysfunction, in which five black families are partic-

ipating. Another study is addressing angioedema or severe allergic reaction, a life-threatening side effect of ACE-inhibitor drugs that is more common in blacks than in whites. Investigators are determining the mechanisms that cause the side effect and studying the genetic profile of affected individuals and their families in order to detemine who should avoid taking the drugs.

High Blood Pressure

Etiology and Pathophysiology

High blood pressure is a serious health problem that is especially prevalent and severe among minorities. An Institute-initiated study is seeking to determine the etiology and pathophysiology of high blood pressure:

- Family Blood Pressure Program (see Chapter 9): To use a network of investigators to identify genes associated with high blood pressure and to examine interactions between genetic and environmental determinants of hypertension in specific minority populations: blacks, Mexican Americans, and Asians.

The NHLBI supports a number of investigator-initiated studies to identify genes linked to hypertension in blacks, Mexican Americans, and whites to determine if part of the disparity in prevalence can be attributed to genetic differences among the groups. Genes under investigation include those associated with the renin-angiotensin system, the autonomic nervous system, and sodium transport.

The Institute supports a number of projects to examine antecedents of hypertension in children to determine racial differences in blood pressure regulation. One study is determining relationships between cardiovascular reactivity in adolescent normotensive blacks and development of pathobiologic markers of hypertension risk (i.e., increased resting blood pressure, left ventricular mass, and relative wall thickness) later in life. Another is investigating the genetics of cardiovascular reactivity following stress in black youth.

Researchers also are examining the influence of SES and ethnic discrimination on stress reactivity to determine if it provides a pathophysiologic link to CVD in blacks. One group is examining the combined influence of low SES and ethnicity on development of behavioral risk factors (i.e., hostility, anxiety, and heightened cardiovascular reactivity to stress) in a group of adolescents; 50 percent of them are black. Another group is assessing the relationship between early life exposure to socioeconomic stressors such as adverse socioeconomic conditions, low levels of social integration, and racial discrimination and development of hypertension in blacks.

Investigators have observed that blacks have an augmented blood pressure response to salt. A study to improve understanding of the genetic basis and phenotypic characterization of salt-sensitive hypertension in blacks has located a specific region of the kidney where sodium is reabsorbed more extensively in blacks than in whites.

Impaired sodium regulation also appears to be linked to the development of hypertension. Scientists are investigating the effects of stress on salt retention and measuring hormonal variables known to influence sodium regulation. One study is seeking to determine whether the mechanisms regulating sodium retention differ between blacks and whites. Researchers found that black youths have a slower salt excretion rate in response to stress than white youths. Another study is examining the role of sodium and obesity in hypertension development among blacks living in three different environments: Nigeria, Jamaica, and Chicago. In a twin study consisting of 41 percent blacks, scientists are investigating sodium retention as a mechanism augmenting systemic vascular resistance and changes in vascular function, ventricular structure, and blood presssure.

The role of dietary factors, particularly macronutrients, in the etiology of high blood pressure is another area of investigation. Scientists are conducting epidemiologic studies among participants with diverse ethnicity, SES, and dietary habits in four countries to determine the impact of selected dietary components (proteins, lipids, carbohydrates, amino acids, calcium, magnesium, sodium, potassium, antioxidants, fiber, and caffeine) on blood pressure. Another study is seeking to identify the link between healthy diet, genetic factors, and their underlying biological mechanisms.

Treatment and Prevention

Identifying effective treatment strategies for various populations requires large-scale studies with representative populations in sufficient numbers.

- Ancillary Pharmacogenetic Studies in Heart, Lung, and Blood Diseases and Sleep Disorders: To conduct pharmacogenetic studies in ongoing or completed clinical trials/studies related to heart, lung, and blood diseases and sleep disorders to examine genetic influences on interindividual differences in prescription drug response. Understanding the genetic influences may permit improved medication choice and dosing in individuals and help avoid either serious adverse response or poor response to therapy. Three of the studies focus on antihypertensive drugs and include 50 to 58 percent blacks.

Although it is well known that reducing hypertension will reduce CVD rates, the implementation of evidence-based guidelines for hypertension treatment in clinical practice is not very high. To address this issue, the NHLBI initiated a program to improve hypertension control rates in blacks, a group with the highest prevalence and earliest onset of hypertension and with a disparately high premature cardiovascular mortality and morbidity:

- Interventions To Improve Hypertension Control Rates in African Americans: To evaluate the feasibility of clinical interventions directed at the medical care delivery system to increase the proportion of blacks who have their blood pressure controlled to levels specified by the JNC VII guidelines.

Understanding racial differences in blood pressure control is an area of major interest for the Institute. Scientists are examining whether variations in genes of the renin-angiotensin-aldosterone system predict differences in blood pressure response to diuretic therapy among hypertensive blacks and whites. Research also is being focused on variations in the ACE gene between blacks and whites to explain racial differences in the antihypertensive responsiveness to ACE inhibitors.

The Institute supports a number of investigator-initiated studies to evaluate various interventions to improve hypertension management. One study is testing the effectiveness of a two-staged intervention involving telemonitoring of blood pressure and telephone-based nurse care management in 12 community-based clinics that serve an economically disadvantaged, largely black and Hispanic populations. Another study is evaluating two interventions compared to usual care (regular primary care clinic visits) in blacks with hypertension who have several risk factors (smoking, sedentary lifestyle, and high sodium intake) for CVD. The interventions include the following: (1) simultaneous intervention (smoking cession, increased exercise, and decreased salt intake) in a clinical session, with stage-specific telephone support and follow-up and (2) sequential intervention of each targeted behavior presented individually at a clinic session, with stage-specific telephone support and follow-up.

Anger and hostility have been demonstrated as risk factors for hypertension. Scientists are evaluating an anger management intervention in a hospital setting with 46 percent blacks to determine if it will lead to improved blood pressure and psychosocial risk factors (e.g., reduce depression).

Education

The NHLBI (see Chapter 2) has developed a number of outreach activities to inform minority populations of the importance of blood pressure control. Included among them are a toll-free number that provides materials on hypertension in English or Spanish; mini telenovelas (Más vale prevenir que lamentar), "health moments" to reinforce CVD prevention for local Spanish-language television stations; a Spanish version of the High Blood Pressure Education Month Kit; and several publications for health professionals, patients, and the public. Below are some examples:

- *Sí se Puede: Prevenir y Controlar la Presión Arterial Alta con Actividad Física*
- *Plan de Alimentación Saludable Contra la Hipertensión: Prevenir y Controlar la Presión Arterial Alta Siguiendo el Plan de Alimentación Conocida Como DASH*
- *Sí se Puede: Prevenir y Controlar la Presión Arterial Alta. Lo Que Usted Debe Saber Sobre la Prevención y Control de la Presión Arterial Alta*
- *Sí se Puede: Prevenir y Controlar la Presión Arterial Alta. Lo Que los Médicos Deben Saber*
- *Take Steps To Prevent High Blood Pressure* in English and Spanish
- *Cut Down on Salt and Sodium* in English and Spanish
- *Churches as an Avenue to High Blood Pressure Control*
- *Working With Religious Congregations: A Guide for Health Professionals*
- *Protect Your Heart! Prevent High Blood Pressure*

- *Spice up Your Life! Eat Less Salt and Sodium*
- *Keep the Harmony Within You—Check Your Blood Pressure*
- *Keep Your Heart in Check—Know Your Blood Pressure Number* in Tagalog and English and in Vietnamese and English
- *Prevent and Control High Blood Pressure: Mission Possible.*

NHBPEP Coordinating Committee Activities

Member organizations of the NHBPEP coordinating committee have continuing education programs on the prevention and treatment of hypertension that are focused on their minority members. They also support hypertension prevention and awareness in community-based settings such as screening and church activities, community awareness campaigns, and media events.

High Serum Cholesterol

Etiology

The Institute supports a number of investigator-initiated projects to identify genes that influence the lipoprotein profile within various racial and ethnic groups. Research findings could offer an explanation for differences in susceptibility to CHD found between various racial and ethnic groups.

Variation in hepatic lipase activity is associated with differences in plasma concentrations of HDL and LDL synthesis and catabolism. Researchers are investigating whether ethnic differences in hepatic lipase activity are responsible for the well-known differences in plasma HDL concentrations found in blacks and whites. Genetic studies are being conducted on a population that is 39 percent black.

Prevention

The NHLBI is supporting an investigator-initiated study among minority preschool children to track the long-term effectiveness of nutrition interventions on blood cholesterol and diet. Additional potential risk factors, such as increased blood pressure, obesity, and intention to smoke, will also be monitored.

Education

The NCEP (see Chapter 2) has prepared the following publications on blood cholesterol for minority audiences.

- *Learn Your Cholesterol Number* in Spanish and English
- *Protect Your Heart—Lower Your Blood Cholesterol* in Spanish and English
- *Heart-Healthy Home Cooking African American Style*
- *Delicious Heart-Healthy Latino Recipes*
- *Cut Down on Fat—Not on Taste* in Spanish and English
- *Empower Yourself! Learn Your Cholesterol Number*
- *Be Heart Smart! Eat Foods Lower in Saturated Fats and Cholesterol*
- *American Indian and Alaska Native People: Treat Your Heart to a Healthy Celebration*
- *Serve Up a Healthy Life—Give the Gift of Good Nutrition* in Tagalog and English, and in Vietnamese and English.

Obesity

Etiology

The latest NHANES data show a continued rise in the proportion of Americans who are overweight; black women are especially at risk. To understand the reasons for the racial disparity among women, the Institute initiated a long-term program, the NHLBI Growth and Health Study (NGHS), to examine the development of obesity and CVD risk factors in a biracial cohort of young girls. The study, which ended in FY 2000, found black girls consumed more calories and a higher percentage of calories from fat and watched more television than white girls. An investigator-initiated study using the NGHS cohort, starting at ages 18 to 19 years, is examining the changes in cardiac output and total peripheral resistance that occur with developing obesity and their influence on ethnic difference in blood pressure regulation. Another project, using data from the NGHS, is examining CHD risk factors in black and white girls to identify genes involved in black–white differences in lipid metabolism and obesity.

Black women have been shown to manifest lower resting energy expenditure than white women. Scientists seeking to improve our understanding of ethnicity, genetics, energy metabolism, and obesity development will

examine the relationship between two genes implicated in energy metabolism and resting energy expenditure in high-risk blacks.

Menopause-related coronary risk was previously believed to be associated with a gain in total body fat. Research, however, suggests that the location of the fat, not the total fat per se, is the key risk factor. An investigator-initiated study is seeking to determine if indices of central adiposity, particularly intra-abdominal fat, predict coronary events better than indices of total fat. The study is also examining the role of central adiposity with altered glucose and lipid metabolism and elevated blood pressure; 48 percent of the population are black.

Treatment and Prevention

The NHLBI has initiated several programs to test approaches for treating or preventing obesity.

- GEMS (see Chapter 9): To test the effectiveness of weight-control interventions involving diet, physical activity, and psychosocial and familial influences, administered during the critical transitions from prepuberty to puberty in black girls at high risk for obesity.
- Overweight and Obesity Control at Worksites: To test innovative interventions that emphasize environmental approaches or the combination of environmental and individual approaches at worksites to prevent or treat obesity in adults. Environmental strategies include programs, policies, or organizational practices (e.g., increasing the availability of, and providing access to, healthful food choices and facilities for physical activity, and creating a socially supportive climate to influence healthy behaviors). Targeted groups for some projects include individuals from underrepresented racial and ethnic groups.
- POUND LOST (see Chapter 9): To evaluate the effectiveness of four diets differing in macronutrient composition to promote and sustain weight loss in overweight and obese individuals; approximately 25 percent of the participants will be black.
- Primordial Prevention of Overweight in American Indian Children (see Chapter 9): To prevent American Indian children from becoming overweight at an early age. Culturally appropriate interventions, including family counseling to improve nutrition and physical activity in infants and toddlers, will be developed and introduced community-wide.
- WLM (see Chapter 9): To determine the effectiveness of continuous patient contact on weight loss maintenance in adults who recently lost weight; 40 percent of the patients are black.

The Institute supports a number of investigator-initiated studies on the effectiveness of obesity prevention and control interventions among diverse populations. One study is testing the effectiveness of weight-control interventions (involving diet, physical activity, and psychosocial and familial influences) administered during the critical transition period from prepuberty to puberty in black girls at high risk for obesity. Two studies are evaluating the effectiveness of weight control programs to prevent weight gain in a predominately black population that has recently completed a smoking cessation program. The blood pressure status of the participants, who are prehypertensive or hypertensive at the beginning of the studies, will be monitored.

Hispanic parents and children are participating in a program that targets physical activity and dietary behaviors in a microenvironment (i.e., home environment) and in a macroenvironment (i.e., apartment complex, schools, grocery stores, parks, and restaurants). Community health workers (promotoras) are working with the families and the community to increase awareness and promote environmental change. Preadolescent black girls are the subject of a study to test the efficacy of an after-school dance program and a family-based intervention involving reduced use of television, videotapes, and video games to reduce weight gain.

Obesity is one of the major health challenges facing Native American children and has serious implications for the development of type 2 diabetes. A school-based intervention, augmented with a family intervention, is focusing on reducing excess weight gain by increasing physical activity and healthy dietary practices in kindergarten and first-grade Native American children. A project with a subject population consisting of Asians, Hispanics, and whites is testing an integrated school- and community-based intervention involving physical activity and diet to reduce the prevalence of obesity.

Blacks at high risk of CVD often have limited success in weight loss and lifestyle change programs. A study was initiated to examine the role of social support, particularly from family members and friends, to facilitate

weight loss and related dietary and physical activity changes in blacks.

Education

The NHLBI OEI (see Chapter 2) has prepared health information on losing excess weight for minorities.

- *Watch Your Weight* in English and Spanish
- *Embrace Your Health! Lose Weight if You Are Overweight.*

Physical Inactivity

The Institute has initiated research on the effectiveness of an intervention program to encourage greater physical activity among adolescent girls.

- TAAG (see Chapter 11): To test the effectiveness of school–community-linked interventions to reduce the decline in physical activity in adolescent girls, from grades 6 through 8. As estimated 5,000 girls, approximately 50 percent minority, from 36 schools are participating.

The NHLBI supports several investigator-initiated studies on strategies to increase physical activity among minority populations. Included among them are studies to examine the effect of vigorous exercise on reduction of childhood obesity in black girls. A school-based study is evaluating the effects of vigorous exercise programs on decreasing the accretion of general and visceral adiposity in black girls.

An ancillary study to an Institute-initiated program to reduce the decline in physical activity in adolescent girls (TAAG) is investigating the influence of community characteristics (e.g., street design, access to public transportation, facilities for physical activity, population mix, and socioeconomic mix of the neighborhood) on physical activity levels and body mass index; approximately 50 percent of the girls are minority. Two other studies are seeking to determine the factors that lead to decline in physical activity in adolescent girls. They include the effects of previous exposure to physical activity intervention, race and ethnicity, weight, psychosocial influences, and the environment.

Physical inactivity among children is often attributed to the lack of open space, lack of recreational equipment, and fear by parents for the safety of children playing outdoors. A study is being conducted to determine if an intervention that changes these neighborhood features in a low-income, inner-city neighborhood will increase physical activity in children.

Scientists have observed an age-related decline in aerobic capacity, but have not been able to discern the effects of physical activity, body fat, and genetic variation on its rate of change. They also have little understanding about how the rate of change in aerobic capacity during early and middle adulthood affects CVD development. An ancillary, investigator-initiated study being conducted in conjunction with the Year 20 CARDIA examination is addressing these issues. Data from this study should increase understanding of the interrelationships of cardiorespiratory fitness, body composition, and CVD-related risk factors and endpoints, and may provide the basis for more extensive evidence-based recommendations on the role of fitness in cardiovascular health; 46 percent of the participants are black.

Education

The Institute has prepared the following publications for minorities on the importance of physical activity and ways to become more physically active.

- *Stay Active and Feel Better* in English and Spanish
- *Energize Yourself! Stay Physically Active*
- *American Indian and Alaska Native People: Be Active for Your Heart!*
- *Be Active for a Healthy Heart* in Tagalog and English
- *Be Active for a Healthier Heart* in Vietnamese and English.

The Institute also has developed a Web-based application on physical activity for lay health educators in English and Spanish, which can be found at http://hin.nhlbi.nih.gov/salud/pa/index.htm.

Smoking

Smoking among minorities has increased significantly compared with whites. To determine the causes of the increase, the Institute is supporting an investigator-initiated study in a predominately minority population to examine factors that prompt them to initiate smoking. In addition, the study seeks to identify predictors of cessation.

The Institute is also supporting a number of studies of smoking intervention and follow-up cessation maintenance that specifically target minorities. Two studies are evaluating the effectiveness of smoking cessation programs for smokers who seek treatment at the hospital emergency department. One study involves patients who suffer from acute respiratory illness; approximately 35 percent are minorities. The other targets Chinese American patients hospitalized with CVD, pulmonary disease, or diabetes mellitus. A third study is seeking to determine if the addition of a physical activity intervention improves smoking cessation; 45 percent of the participants are black.

Two types of pharmacologic therapies (nicotine replacement therapy and sustained-release bupropion) have been approved by the FDA for smoking cessation in the United States. Scientists are comparing the ability of each drug alone or in combination to increase initial and long-term smoking cessation rates in young low-income and minority smokers. Another study is evaluating the efficacy of a weight loss drug intervention to prevent weight gain in obese individuals participating in a smoking cessation program; 44 percent of the participants are black.

Education

The Institute has prepared the following publications on smoking cessation for minorities.

- *Kick the Smoking Habit* in English and Spanish
- *Refresh Yourself! Stop Smoking*
- *American Indian and Alaska Native People: Help Your Heart*
- *Don't Burn Your Life Away—Be Good to Your Heart* in Tagalog and English and in Vietnamese and English.

Psychosocial Factors

Major depression is a risk factor in the development of ischemic heart disease and for death after an acute MI. Investigator-initiated research is seeking to determine the pathways that link depression to physiological mechanisms in post-MI patients. One study is examining the link between the severity of depressive symptoms to the inflammatory process implicated in atherogenesis by focusing on the basal expression of cytokines and cell adhesion molecules on blood monocytes. Another is focused on the autonomic nervous system and its link to depression. A third study is investigating the role of platelets, platelet aggregation, and adhesion in patients with major depression. Approximately a third of the population in the studies is black.

The NHLBI is interested in the effect of depression, anxiety, and lack of social support on prognosis after a CHD event. An investigator-initiated study is examining the efficacy of individual and group therapy in post-MI patients who are socially isolated or clincally depressed. Scientists will be measuring biological risk factors (e.g., lipids, adiposity, coagulation factors) and possible subclinical markers of disease (e.g., carotid intimal-medial thickness, coronary calcification); 34 percent of the participants are black.

The Institute supports investigator-initiated research on the role of race and ethnicity, psychosocial and environmental factors, and low SES in the development of CHD. Scientists are investigating the contribution of biobehavioral factors (hostility, anxiety, and heightened cardiovascular reactivity to stress) in the etiology, pathogenesis, and course of CHD. Racial differences in stress-induced physiologic responses also are being examined. Other investigators are focused on the relationships of psychosocial stress, sleep disordered breathing, and nocturnal physiological measures with emerging risk factors and subclinical CVD; 50 percent of the participants are black.

Investigators are interested in the effects of race and psychosocial factors, such as hostility, on glucose metabolism. A study was initiated to determine how hostility is differentially related to glucose metabolism in blacks and whites. Research findings may increase understanding of the differences in the etiology of diabetes in the two groups.

Additional areas of interest include the genetic basis of aggression and the relationships between risk-promoting variables (psychosocial stress, smoking, poor diet, physical inactivity); presumed mediating variables (sympathetic nervous system activity and insulin metabolism); and CHD risk factors. Fifty to 60 percent of the participants are black or Hispanic.

Diabetes

Diabetes mellitus is a strong risk factor for CVD. Its prevalence is increasing due to the significant increase of obesity and physical inactivity in the population, especially among blacks, Hispanics, and American Indians. To address this growing problem, the Institute is supporting an investigator-initiated study on defining the relationship between the overall dose of endurance exercise training and the corresponding response of metabolic risk factors in an overweight and obese biracial female population. Another study will determine if adolescents with type 2 diabetes have a high risk of developing clinical CVD in their late 20s or 30s. Scientists are using noninvasive imaging techniques for detecting subclinical atherosclerosis to measure CVD development in a predominatly black population.

Hypertension and diabetes are major contributors to CVD and occur disproportionately in blacks. In particular, black women seem to have earlier disease onset and poorer outcomes. Scientists are investigating the link between hypertension and type 2 diabetes and the relative excess of androgen found in black women to determine whether insulin resistance, excess androgen, and endothelial dysfunction contribute to accelerated vascular injury in blacks.

Treatment

The NHLBI supports clinical trials to determine the benefits of various strategies to reduce CVD among patients with diabetes or treat patients with coronary artery disease and diabetes.

- ACCORD (see Chapter 11): To evaluate the benefits of different therapies to reduce CVD in type 2 diabetes; more than one third of the participants are minorities.
- BARI 2D (see Chapter 9): To evaluate whether urgent revascularization offers an advantage over medical therapy in patients with coronary artery disease and diabetes. In addition, for a given level of glycemic control, to determine whether insulin-providing drugs offer advantages or risks compared to insulin sensitizers (drugs that enhance insulin action); 33 percent of the participants are from minority populations.
- SANDS (see Chapter 9): To compare intensive treatment (pharmacologic agents, such as ACE inhibitors and simvastatin for high blood pressure and LDL cholesterol) to conventional treatment in 488 American Indians with diabetes, ages 40 or older. The primary outcome measure is change in carotid intimal-medial thickness.

An investigator-initiated study will evaluate the effectiveness of a multiple risk factor intervention (diet, exercise, stress management, social support, and smoking cessation) targeting postmenopausal Hispanic women with type 2 diabetes.

Lung Diseases

The NHLBI supports research on a number of lung diseases, such as asthma, sarcoidosis, and TB, which disproportionately affect minorities. The following section provides examples of research to address health disparities in lung diseases.

Asthma

Etiology and Pathophysiology

The NHLBI has initiated several studies to determine the etiology and pathophysiology of asthma.

- Cellular and Molecular Mechanisms of Asthma (see Chapter 9): To delineate the cellular and molecular mechanisms underlying acute and chronic asthma through basic and clinical investigations.
- Severe Asthma Research Program: To determine the mechanistic basis for severe asthma and to determine how it differs from mild-to-moderate asthma. Several of the projects have strong minority participation.
- Asthma Exacerbation: Biology and Disease Progression: To elucidate the biologic mechanisms of asthma exacerbation pathobiology and resolution and to determine their effect on lung function, physiology, and disease state; 27 to 56 percent of the study participants will come from various minority populations.

The Institute also supports investigator-initiated projects on the etiology and pathophysiology of asthma. One study is using genomic screening to search for the genetic basis of asthma in a homogeneous Hispanic population in Costa Rica; another study is seeking to identify positional gene candidates for airway hyperresponsiveness and compare their association with asthma between two asthmatic groups: a white population on Tangier Island, VA, and a black population from Barbados; and a

third study seeks to establish the link between specific genotypic variants and phenotypic markers, and to elucidate the immunological pathways that contribute to asthma severity in blacks. A new case-controlled study is seeking to identify genetic determinants of asthma risk among populations of African ancestry by performing genome-wide association studies and gene–gene and gene–environment interaction studies.

Latinos carry a disproportionate burden of asthma. Yet few investigators studying the genetics of asthma have focused on this group, partly due to the complexity of the Latino gene pool. A recently initiated study is developing and testing new methods to correct for population stratification due to racial admixture, a key problem confounding genetic studies in the Latino population. The project focuses on data from the NHLBI-supported Genetics of Asthma in Latino Americans (GALA) to assess population stratification.

Occupational and environmental factors are known to trigger asthma symptoms. An investigator-initiated study is focusing on understanding the mechanisms by which occupational or environmental factors trigger the onset of asthma among low-income, urban blacks and Hispanics. Another study is examining the association of early exposure to endotoxin (which appears to promote the development of the immune system), nitrogen dioxide, and aeroallergens (which trigger asthma exacerbations); obesity; physical inactivity; and environmental tobacco smoke on the prevalence, persistence, and incidence of asthma in black and Hispanic children enrolled in inner-city Head Start programs.

Circadian change in airway function is an important aspect of asthma, as more than 70 percent of deaths and 80 percent of respiratory arrest occur during sleep. Focusing on nocturnal asthma, researchers are investigating the mechanisms that cause the changes in airway function that lead to exacerbation of symptoms; 36 percent of the population are minority.

Treatment and Control

The Institute has initiated research to identify optimal drug strategies for treatment and management of asthma. Because the burden of asthma disproportionately affects minority children, it is important for them to be well represented in clinical trials.

- ACRN-Phase II (see Chapter 9): To support an interactive network of asthma clinical research groups to conduct studies of new therapies for asthma and disseminate findings to the practicing community. Overall, 33 percent of the participants are from minority populations.
- CARE (see Chapter 11): To support a network of pediatric clinical care centers to determine optimal treatment and management strategies for children with asthma. The studies considered by the network will attempt to customize therapy based on specific asthma phenotypes and genotypes; 30 percent of the population will be minorities.
- Centers for Reducing Asthma Disparities (see Chapter 9): To support partnerships between minority-serving institutions and research-intensive institutions to conduct studies on causes of and corrections for disparities in asthma among racial/ethnic and low SES populations. Reciprocal training is encouraged to ensure culturally sensitive projects and enhance research capabilities.

The Institute is also supporting investigator-initiated studies focusing on finding effective treatment for various populations. One study is examining the effect of steroids on enhanced alpha-adrenergic vascular responsiveness in asthma; 77 percent of the participants are minority. Another study is using preexisting, well-characterized asthma patient cohorts to identify genetic variants that can predict therapeutic response to asthma drugs. Scientists are interested in the influence of race/ethnicity on the genetic factors associated with asthma therapeutic responses.

Translational Activities

Ensuring full use of modern asthma treatment strategies is an important goal of the NHLBI. The Institute is supporting an investigator-initiated study to determine the effectiveness of an intervention that is removing barriers to preventive care to improve asthma management and lower asthma morbidity. Scientists are using a Breathmobile to deliver asthma screening to black children attending Head Start Programs and a special consultation service to communicate directly with the parents about asthma management. Another study among low-income, inner-city children with asthma attending preschool is testing a bilingual intervention program to improve asthma management; 60 percent of the participants are Hispanic and 40 percent are black.

Additional studies to improve asthma management among minority groups include a study to determine whether shared decision making in choosing asthma therapy between patients and physicians improves adherence in a patient population consisting of 82 percent minority and a study to test whether individualized interventions will improve asthma management in a black and Hispanic population. A third study seeks to improve asthma management by teaching children with asthma to recognize symptoms of the presence of airflow obstruction; 42 percent of the participants are black and 6 percent are Hispanic.

Two randomized controlled trials are being conducted among patients recruited at the time of an emergency department visit for asthma exacerbation. One study is testing an intervention to enhance knowledge, self-efficacy, and asthma-related social support; 40 percent of the patients are minority. The other focuses on young black children recruited at the time of an emergency department visit for asthma exacerbation. Investigators are testing the effectiveness of an intervention strategy that includes case management, telephone contacts, and a monetary incentive to increase follow-up visits to primary care providers.

Three studies are evaluating the benefits of working with public school systems to improve adherence to asthma management. In Birmingham, scientists are evaluating the impact of school-based supervised asthma therapy on asthma exacerbations in a predominately black population with moderate-to-severe asthma. In New York, they are testing the ability of an intervention that includes in-school intensive asthma education to 9th- and 10th-grade students who have persistent asthma and intensive asthma education for their community physicians to improve asthma morbidity; 90 percent of the participants are black. In Detroit, investigators are developing and evaluating computer-based instructions and peer counseling for black teens with asthma.

Chronic environmental tobacco smoke exposure, particularly from parental smoking, is associated with more severe asthma, increased incidence of emergency department visits, life-threatening attacks, and prolonged time to recovery from asthma exacerbation requiring hospitalization. A study is being conducted to evaluate an intervention tailored to parental stage of change regarding smoking practice, to reduce asthma crisis care used by children with persistent asthma.

Education

The NAEPP (see Chapter 2) has developed easy-to-read materials on asthma treatment and control directed to audiences with low literacy.

- *Facts About Controlling Your Asthma*
- *El Asma: Cómo Controlar Esta Enfermedad.*

Sarcoidosis

Sarcoidosis is an inflammatory disease of unknown etiology characterized by persistent granulomas with damage to surrounding tissue. The Institute has initiated a program to determine the immunopathogenesis of granulomatous inflammation found in sarcoidosis, including the role of predisposing factors, the immune components involved in the formation of granulomas and the defective regulatory immune response.

Investigator-initiated studies on the causes of sarcoidosis include a study to identify genes linked to sarcoidosis susceptibility in blacks and to determine if hereditary susceptibility predisposes blacks to sarcoidosis, and a project to elucidate the mechanisms involved in the immunologic and inflammatory processes that ultimately lead to end-stage fibrosis in progressive pulmonary sarcoidosis; many of the participants are black.

Sleep Disorders

Etiology

Sleep apnea is a common disorder that disproportionately affects blacks and is associated with an increased risk of CVD, including hypertension and stroke; it is particularly prevalent in heart failure patients. An Institute-initiated program is assessing the interrelationship between sleep disorders and heart failure, and the mechanisms leading to cardiovascular stress when the two interact.

The NHLBI supports research on the etiology, pathophysiology, and consequences of sleep-disordered breathing (SDB), a condition characterized by repetitive interruptions in breathing.

- Neurobiology of Sleep and Sleep Apnea (see Chapter 9): To integrate molecular, cellular, and genetic approaches to sleep control with clinical investigation on the etiology and pathogenesis of sleep disorders, particularly sleep apnea. One study has 39 percent minority participation.

- Sleep Heart Health Study (see Chapter 9): To determine the degree to which sleep apnea is an independent or contributing risk factor for the development of cardiovascular or cerebrovascular disease; 23 percent of the participants are from various minority and ethnic populations.

The Institute also supports a wide spectrum of investigator-initiated projects to elucidate cardiovascular and other health consequences of SDB. Ongoing studies in various community settings are assessing the health risks of SDB within specific ethnic populations, including blacks, Hispanics, Asians, and American Indians. A study of sleep in black families is investigating whether sleep problems contribute to diabetes, and the potential relationship to CVD. Characterization of how SDB occurs within family groups is helping to identify potential genetic risk factors that may allow early identification and treatment of high-risk individuals. A community-based study of sleep in Hispanics is assessing the prevalence and awarenesss of sleep disorders.

New findings from two independent studies associate SDB with a two- to fourfold increased frequency of stroke in middle-aged adults. A 3-year prospective clinical study of 1,000 middle-aged adults found that the frequency of stroke and all-cause mortality was doubled among participants diagnosed with moderate-to-severe sleep apnea.

Treatment and Control

The NHLBI has initiated a multisite clinical trial to find effective treatments for sleep apnea.

- APPLES (see Chapter 9): To determine whether continuous positive airway pressure is an effective treatment for excessive daytime sleepiness and cognitive impairment associated with moderate-to-severe SDB; 30 percent of the participants are minority.

Education

The NHLBI published *Your Guide to Healthy Sleep*, which provides the latest information about sleep apnea and other sleep disorders including insomnia, restless legs syndrome, and narcolepsy.

Tuberculosis

Etiology

The Institute has initiated genetic studies to characterize genes associated with TB susceptibility and host immune responses to infection.

- Genetic Aspects of Tuberculosis in the Lung: To identify genes or families of genes that determine resistance and susceptibility to mycobacterial infection, virulence, latency, reactivation of TB, and resistance to antituberculous drugs. A large number of the participants being recruited are from minority populations.

Treatment and Control

The NHLBI supports a number of investigator-initiated studies focused on understanding the relationship between the immune system and TB. Most of the patients are from minority populations. Included among them are studies to: (1) identify the correlates of protective immunity in a Mexican population in order to aid development of anti-TB vaccines; (2) compare susceptibility to TB in populations in Mexico and Peru; (3) examine the role of interferon-gamma in the pathogenesis of TB among Hispanics with and without HIV; (4) identify and characterize host factors that predispose Asians to develop TB; and (5) determine the effectiveness of adding aerosolized interferon-gamma to the usual treatment regimen for advanced TB in predominately minority populations in the United States and South Africa.

The NHLBI also supports research to improve TB control among minority populations. One project is evaluating educational strategies to improve adherence to medication regimens and regular clinic visits among Hispanic adolescents infected with TB. Another study, located in the Harlem community of New York City, is testing a new strategy to promote adherence to therapy among inner-city TB patients. Both programs are outgrowths of behavioral research programs begun by the Institute in 1995.

Education

Building on the foundation laid by the Tuberculosis Academic Award program, the NHLBI is supporting a consortium of five TB curriculum centers.

- TB Curriculum Coordinating Center: To strengthen, expand, and increase access to the best ongoing educational and training opportunities in TB for medical, nursing, and allied health schools, especially those that provide primary care to communities where TB is endemic and the population is at high risk of developing TB.

Blood Diseases

The NHLBI supports basic and clinical research on SCD and Cooley's anemia with the goal of curing the disorders and improving patient care.

Sickle Cell Disease

Basic Research

SCD is an inherited blood disorder that produces chronic anemia, periodic episodes of pain, and end organ damage. It affects about 1 in 500 blacks and 1 in 1,000 Hispanics. Since 1972, the NHLBI has supported an extensive research program to improve understanding of the pathophysiology of SCD and identify better approaches for its diagnosis and treatment and for prevention of complications.

Basic and translational research currently focuses on understanding better the expression of beta globins, elucidating the complex mechanisms of cell adhesion and vaso-occlusion, discovering genes that regulate fetal hemoglobin, describing the genetic factors that are responsible for the wide spectrum of clinical severity, and developing a prospective program for gene therapy.

Specific NHLBI initiatives include:

- Comprehensive Sickle Cell Centers Program (see Chapter 9): To conduct basic and clinical research, deliver state-of-the-art patient care, offer educational activities for patients and health professionals, perform community outreach, and provide genetic counseling services. Ongoing activities include collaborative Phase II drug trials, neurocognitive and neuroimaging studies, a collaborative data and clinical registry, and an epidemiology study of priapism.
- Mechanisms of Fetal Hemoglobin Gene Silencing for Treatment of Sickle Cell Disease and Cooley's Anemia: To identify mechanisms of fetal hemoglobin gene silencing during normal human development and mechanisms of variable silencing in adults, and to develop therapeutic approaches to inhibit silencing. A renewed effort to understand the molecular basis of fetal hemoglobin silencing will facilitate the development of new gene-based therapeutic approaches to inhibit silencing, in order to increase fetal hemoglobin in red blood cells, and thus to cure beta-chain hemoglobinopathies such as SCD and Cooley's anema.
- Molecular Screening Assay Development for SCD: To support the development and adaptation of biological assays for automated, high throughput screening of compounds that can potentially be used to improve the understanding of the biology of SCD and provide inroads toward new agents for SCD treatments.
- Pulmonary Complications of Sickle Cell Disease: To stimulate translational research on the pulmonary complications of SCD. The initiative will stimulate collaborative research between investigators in hematology and pulmonary science that combine basic and clinical approaches. It includes research on the major known pulmonary complications of SCD due to acute chest syndrome, pulmonary hypertension, and oxyhemoglobin desaturation.

Basic research advances reported in FY 2006 include:

- Proof-of-principle in rodent models that genetic modification of embryonic stem cells can be used to correct disease-causing mutations and that the corrected cells can give rise to animals cured of SCD.
- An improved gene therapy method for SCD in rodent models that involves simultaneous delivery of a normal hemoglobin gene and a separate RNA interference gene that reduces expression of sickle hemoglobin.
- Demonstration that biologically active CD40 ligand is elevated in patients with sickle cell anemia. This work offers new insights into the processes that contribute to inflammation and coagulation in SCD and suggests a previously unrecognized role of platelets in SCD pathophysiology.

Clinical Research

The NHLBI is committed to finding improved treatments and ultimately a cure for SCD and other hemoglobinopathies. Institute-initiated studies have begun to yield therapies that will alleviate the symptoms of sickle cell anemia and procedures that should ultimately provide a cure.

- BABY HUG (see Chapter 11): To assess the effectiveness of hydroxyurea in preventing onset of chronic organ damage in young black children with sickle cell anemia. At baseline, this trial has demonstrated that spleens and kidneys are already damaged by 1 year of age.
- SWITCH (see Chapter 9): To demonstrate that hydroxyurea and phlebotomy can maintain an acceptable stroke recurrence rate and significantly reduce hepatic iron burden in comparison to transfusion plus chelation in children who have had prior overt stroke.
- Multicenter Neurocognitive and Neuroimaging Study in Adult Sickle Cell Disease: To assess baseline neurocognitive function and neuroimaging abnormalities in adults with SCD and to randomize patients identified with subnormal neurocognitive scores to receive 6 months of transfusion versus standard care, followed by reassessment of baseline neurocognitive function.
- Sickle Cell Disease Clinical Research Network (see Chapter 11): To conduct Phase III randomized, controlled clinical trials to test the efficacy and effectiveness of new therapies to treat and prevent complications of SCD and, when appropriate, thalassemia. The interventions will be based on results from basic studies and Phase I and Phase II clinical trials conducted in programs such as the NHLBI Comprehensive Sickle Cell Centers Program.
- Sildenafil for Pulmonary Hypertension in Adult Patients With Sickle Cell Disease—Phase II Clinical Trial: To test the effects of 16 weeks of chronic sildenafil therapy on exercise endurance and pulmonary artery pressure in patients ages 14 or older with pulmonary hypertension and SCD. The NHLBI Intramural Vascular Medicine Branch will participate as one of the nine clinical centers in this trial.

The NHLBI supports several transplant-related clinical studies that seek to reach minority populations.

- Blood and Marrow Transplant Clinical Trials Network (see Chapter 11): In collaboration with the NCI, to perform clinical trials to advance hematopoietic stem cell transplantation. To reach minority populations, the Network supports bilingual transplant center personnel and provides public Web pages and educational materials. In addition, the Network is working with the National Marrow Donor Program to develop strategies and implement procedures to enhance enrollment of patients from minority groups.

The Cord Blood Stem Cell Transplantation (COBLT) Study was completed in 2005. The COBLT bank contained more than 8,000 cord blood units, approximately 57 percent of them from minority donors. Approximately 30 percent of the COBLT transplant patients were minority. More than 3,500 of the COBLT cord blood units are currently available through the National Bone Marrow Donor Registry for clinical transplantation.

Outcomes Research

For the past several years the NHLBI has supported working groups and meetings to understand the health and quality-of-life obstacles and challenges faced by adults with SCD. Activities to address the needs of the adult SCD patient community in 2006 include:

- A contract with the American Institute for Research to develop and validate an instrument to measure health-related quality of life among adults with SCD.
- A Working Group convened to develop health objectives for people with SCD.
- A conference grant to address sickle cell pain management—plans are to establish a panel of SCD experts (appropriate specialists, primary care providers, SCD patients, and members of the SCD community) to create evidence-based guidelines covering the main areas of clinical concern in SCD (i.e., chronic and acute pain, renal disease, pulmonary disease, transfusion and stem cell transplantation, routine health care maintenance, women's and men's health, and psychosocial issues).

Education

The NHLBI has developed a number of publications on SCD that target minorities.

- *Datos Sobre La Anemia Falciforme* (Facts About Sickle Cell Anemia)
- *Fact Sheet: Hydroxyurea in Pediatric Patients With Sickle Cell Disease*
- *Facts About Sickle Cell Anemia*
- *Patient Fact Sheet: The Multicenter Study of Hydroxyurea in Sickle Cell Anemia (MSH)*
- *Management and Therapy of Sickle Cell Disease.*

Cooley's Anemia

Cooley's anemia is an inherited disorder of red blood cells that affects primarily people of Mediterranean, African, Southeast Asian, Chinese, and Asiatic Indian origin. In 2000, the Institute initiated a program to establish a network of clinical research centers to evaluate new therapeutic agents. Research efforts include developing oral chelators to remove iron overload caused by repetitive transfusion therapy, testing drugs to enhance fetal hemoglobin production, and examining hematopoetic transplantation and gene therapy approaches to cure the disease. A registry with samples has been established to foster genomic and proteomic studies. International collaborations have also been estabilised.

- Thalassemia (Cooley's Anemia) Clinical Research Network (see Chapter 11): To establish a group of clinical centers to accelerate research in the management of thalassemia, standardize existing treatments, and evaluate new ones.

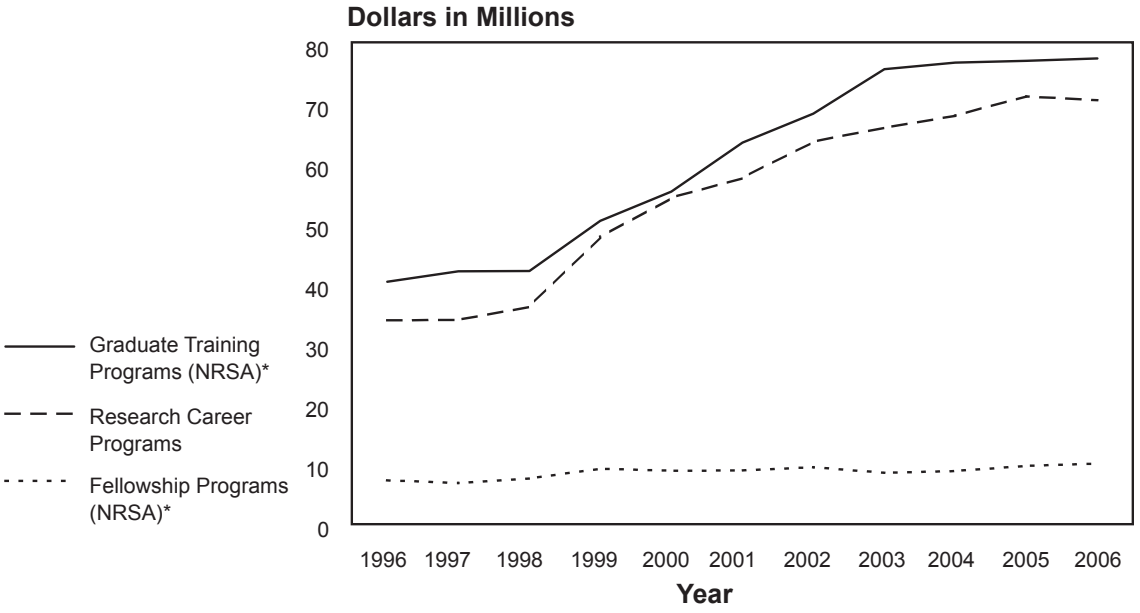
Studies initiated within this network include efforts to develop oral chelators to remove the iron overload caused by repetitive transfusion therapy; exploration of hormone therapy for patients surviving into their teens; testing of drugs intended to enhance fetal hemoglobin production (hydroxyurea, butyrate, and decitabine); prevention of bone diseases; optimum treatment of hepatitis; treatment of heart disease and iron overload; noninvasive ways of measuring iron burden; and efforts to improve the safety of the Nation's blood supply.

Women's Health Initiative

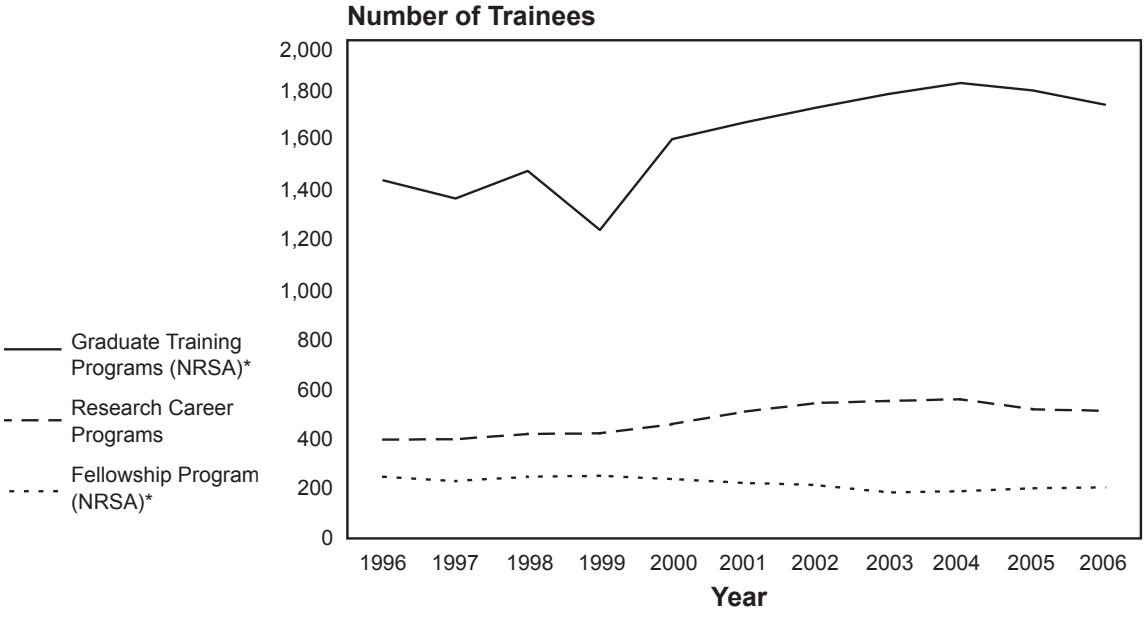
Coronary heart disease, cancer, and osteoporosis are the most common causes of death, disability, and impaired quality of life in postmenopausal women. The WHI (see Chapters 2 and 11) is addressing the benefits and risks of hormone therapy, changes in dietary patterns, and calcium/vitamin D supplements in disease prevention. Several of the centers have recruited primarily minority populations: blacks, Hispanics, Asians, Pacific Islanders, and American Indians. The Clinical Trial recruited 12,607 minorities and the Observational Study recruited 15,658. Overall, of the 161,809 postmenopausal women recruited into the WHI, 17 percent were minorities.

13. Research Training and Career Development Programs

NHLBI Research Training and Career Development Obligations: Fiscal Years 1996–2006



NHLBI Full-Time Training Positions: Fiscal Years 1996–2006



* National Research Service Awards (NRSA).

Note: Numbers of awards and trainees may not agree with other tables due to the method of counting supplements.

Training Awards, Full-Time Training Positions, and Obligations by Activity: Fiscal Year 2006

	Number of Awards Obligated	Trainees (Full-time Training Positions)	Direct Cost	Indirect Cost	Total Cost	Percent of Total NHLBI Training Program Dollars
Fellowship Programs						
Predoctoral Fellowship Award (F31)	32	32	$ 1,201,756	$ —	$ 1,201,756	1.4%
Individual NRSA (F32)	171	171	8,790,419	—	8,790,419	10.1
Senior Fellowships NRSA (F33)	2	2	52,780	—	52,780	0.1
Subtotal, Fellowships	205	205	10,044,955	—	10,044,955	11.5
Graduate Training Programs						
Institutional NRSA (T32)	204	—	66,657,406	5,173,681	71,831,087*	82.1
Minority Institutional NRSA (T32)	4	—	687,833	55,380	743,213	0.9
Off-Quarter Professional Student Training NRSA (T34, T35)	18	—	2,046,871	168,428	2,215,299	2.5
Short-Term Training for Minority Students (T35M)	29	—	2,310,145	216,301	2,526,446	2.9
Subtotal, Graduate Training Programs	255	—	71,702,255	5,613,790	77,316,045*	88.5
Total, Training Programs	**460**	**205**	**$81,747,210**	**$5,613,790**	**$87,361,000**	**100.0%**

* Excludes assessment of $1,818,000.

History of Training Obligations by Activity: Fiscal Years 1996–2006

	Dollars (Thousands)										
	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Fellowship Programs											
Predoctoral Fellowship Award (F31)	$ 551	$ 388	$ 466	$ 346	$ 248	$ 264	$ 478	$ 563	$ 549	$ 794	$ 1,202
Individual NRSA (F32)	6,483	6,281	6,969	8,807	8,517	8,515	8,887	7,868	8,128	8,813	8,790
Senior Fellowships NRSA (F33)	233	179	125	90	92	147	84	112	144	58	53
Intramural NRSA (F35)	—	—	—	—	—	—	—	—	—	—	—
Subtotal, Fellowships	7,267	6,848	7,560	9,243	8,857	8,926	9,449	8,543	8,821	9,665	10,045
Graduate Training Programs											
Institutional NRSA (T32)	36,718[A]	38,253[B]	37,904[C]	45,551[D]	50,507[E]	58,516[F]	62,999[G]	69,951[H]	71,229[I]	70,524[J]	71,831[K]
Minority Institutional NRSA (T32)	679	898	706	901	1,167	996	1,092	1,006	734	1,184	743
Off-Quarter Professional Student Training NRSA (T34, T35)	1,001	1,216	1,435	1,384	966	1,974	1,987	1,975	1,993	2,233	2,215
MARC (T36)	5	5	5	5	5	5	—	—	—	—	—
Short-Term Training for Minority Students (T35M)	1,834	1,612	1,964	2,494	2,570	1,877	2,057	2,594	2,671	2,976	2,527
Subtotal, Training Grants	40,237	41,984	42,014	50,335	55,215	63,368	68,135	75,526	76,627	76,917	77,316
Total, Training Programs	**$47,504[A]**	**$48,832[B]**	**$49,574[C]**	**$59,578[D]**	**$64,072[E]**	**$72,294[F]**	**$77,584[G]**	**$84,069[H]**	**$85,448[I]**	**$86,582[J]**	**$87,361[K]**

A Excludes Assessment of $982,000.
B Excludes Assessment of $1,004,000.
C Excludes Assessment of $1,032,000.
D Excludes Assessment of $1,216,000.
E Excludes Assessment of $1,280,000.
F Excludes Assessment of $1,424,000.
G Excludes Assessment of $1,584,000.
H Excludes Assessment of $1,716,000.
I Excludes Assessment of $1,744,000.
J Excludes Assessment of $1,764,000.
K Excludes Assessment of $1,818,000.

Full-Time Training Positions by Activity: Fiscal Years 1996–2006

	Number of Positions										
	Fiscal Year										
	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Fellowship Programs											
Predoctoral Fellowship Award (F31)	21	15	19	13	11	12	18	19	18	25	32
Individual NRSA (F32)	220	210	225	237	225	208	194	164	168	176	171
Senior Fellowships NRSA (F33)	7	5	4	2	2	3	2	2	3	1	2
Subtotal, Fellowships	248	230	248	252	238	223	214	185	189	202	205
Graduate Training Programs											
Institutional NRSA (T32)	1,216	1,179	1,423	1,185	1,368	1,425	1,482	1,542	1,578	1,540	1,512
Minority Institutional NRSA (T32)	30	43	52	53	48	43	39	42	32	35	26
Off-Quarter Professional Student Training NRSA (T34, T35)	78	68	—	—	51	109	179	93	99	95	104
Short-Term Training for Minority Students (T35M)	113	75	—	—	136	93	30	107	119	128	99
Subtotal, Training Grants	1,437	1,365	1,475	1,238	1,603	1,670	1,730	1,784	1,828	1,798	1,741
Total, Training Positions	**1,685**	**1,595**	**1,723**	**1,490**	**1,841**	**1,893**	**1,944**	**1,969**	**2,017**	**2,000**	**1,946**

NHLBI Research Career Programs: Fiscal Years 1996–2006

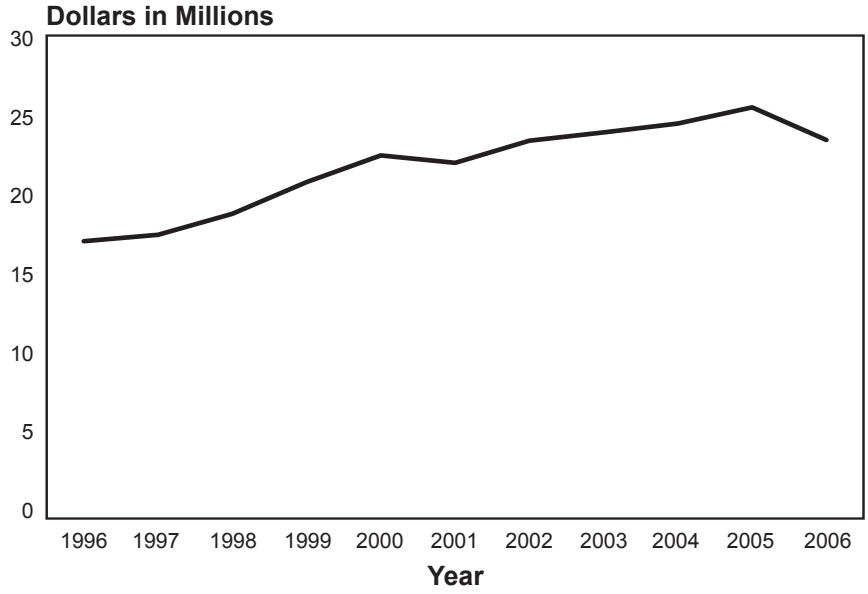
	Number of Awards										
	Fiscal Year										
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Mentored Research Scientist Development Award for Minority Faculty (K01)	—	5	19	30	29	44	54	47	46	45	40
Minority Institution Faculty Mentored Research Scientist Development Award (K01)	—	1	—	—	11	9	2	7	6	4	4
Mentored Scientist Development Award in Research Ethics (K01)	—	—	—	—	—	—	—	2	2	3	3
Independent Scientist Award (K02)	3	8	14	18	27	34	33	32	31	32	24
Research Career Development Award (K06)	25	18	10	6	1	—	—	—	—	—	—
Research Career Award (K06)	3	3	3	2	2	2	2	2	1	1	1
Transfusion Medicine Academic Award (K07)	2	—	—	—	—	—	—	—	—	—	—
Systemic Pulmonary and Vascular Disease Academic Award (K07)	11	9	3	3	1	—	—	—	—	—	—
Asthma Academic Award (K07)	9	9	6	3	—	—	—	—	—	—	—
Tuberculosis Academic Award (K07)	19	23	20	13	9	5	—	—	—	—	—
Sleep Academic Award (K07)	8	12	20	20	20	12	8	—	—	—	—
Nutrition Academic Award (K07)	—	—	10	10	19	19	19	9	9	—	—
Cultural Competence and Health Disparities Academic Award (K07)	—	—	—	—	—	—	—	—	8	14	18
Clinical Investigator Development Award (K08)	254	267	278	262	257	241	236	240	229	239	226
Physician Scientist Award (K11)	12	—	—	—	—	—	—	—	—	—	—
Vascular Medicine Research Career Development Program (K12)	—	—	—	—	—	—	—	—	—	—	2
Clinical Hematology Research Career Development Program (K12)	—	—	—	—	—	—	—	—	—	—	6
Minority School Faculty Development Award (K14)	15	9	—	—	4	1	—	—	—	—	—
Research Development Award for Minority Faculty(K14)	36	34	37	22	7	—	—	—	—	—	—
Career Enhancement Award for Stem Cell Research (K18)	—	—	—	—	—	—	—	1	5	3	2
NHLBI Career Transition Award (K22)	—	—	—	—	—	—	—	—	1	2	1
Mentored Patient-Oriented Research Career Development Award (K23)	—	—	—	13	36	58	90	110	122	127	122
Midcareer Investigator Award in Patient-Oriented Research (K24)	—	—	—	11	20	27	37	38	32	32	33
Mentored Quantitative Research Career Development Award (K25)	—	—	—	—	—	2	7	9	12	17	16
Clinical Research Curriculum Award (K30)	—	—	—	9	16	55	55	55	55	0*	14
Total, Research Career Programs	**397**	**398**	**420**	**422**	**459**	**509**	**543**	**552**	**559**	**519**	**512**

* In FY 2005, the NHLBI relinquished management of the K30 program and as a result did not receive the grant count.

NHLBI Research Career Program Obligations: Fiscal Years 1996–2006

	Dollars (Thousands)										
	Fiscal Year										
	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Mentored Research Scientist Development Award for Minority Faculty (K01)	$ —	$ 460	$ 1,723	$ 2,738	$ 3,650	$ 5,556	$ 5,711	$ 6,156	$ 6,150	$ 6,088	$ 5,453
Minority Institution Faculty Mentored Research Scientist Award (K01)	—	106	101	905	1,300	1,143	1,703	991	867	588	567
Mentored Scientist Development Award in Research Ethics (K01)	—	—	—	—	—	—	—	255	253	355	358
Independent Scientist Award (K02)	207	545	933	1,548	2,350	3,202	3,130	3,099	3,079	3,218	2,421
Research Career Development Award (K04)	1,693	1,226	684	568	69	—	—	—	—	—	—
Research Career Award (K06)	105	103	103	70	70	70	69	69	34	34	34
Transfusion Medicine Academic Award (K07)	326	—	—	—	—	—	—	—	—	—	—
Systemic Pulmonary and Vascular Diseases Academic Award (K07)	1,715	1,415	386	423	113	—	—	—	—	—	—
Asthma Academic Award (K07)	740	764	509	248	—	—	—	—	—	—	—
Tuberculosis Academic Award(K07)	1,496	1,831	1,566	1,161	745	396	—	—	—	—	—
Sleep Academic Award (K07)	699	1,027	1,734	1,736	1,760	1,081	722	—	—	—	—
Nutrition Academic Award (K07)	—	—	1,491	1,480	2,829	2,869	2,906	1,472	1,516	—	—
Cultural Competence and Health Disparities Academic Award (K07)	—	—	—	—	—	—	—	—	925	1,620	2,109
Clinical Investigator Development Award (K08)	21,093	22,238	23,122	29,741	30,189	29,263	29,295	30,288	29,037	30,429	28,973
Physician Scientist Award (K11)	1,023	—	—	—	—	—	—	—	—	—	—
Vascular Medicine Research Career Development Program (K12)	—	—	—	—	—	—	—	—	—	—	772
Clinical Hematology Research Career Development Program (K12)	—	—	—	—	—	—	—	—	—	—	2,360
Minority School Faculty Development Award (K14)	1,158	729	618	445	862	98	—	—	—	—	—
Research Development Award for Minority Faculty (K14)	3,607	3,468	3,099	2,093	393	—	—	—	—	—	—
Career Enhancement Award for Stem Cell Research (K18)	—	—	—	—	—	—	—	243	980	512	213
NHLBI Career Transition Award (K22)	—	—	—	—	—	—	—	—	185	364	178
Mentored Patient-Oriented Research Career Development Award (K23)	—	—	—	1,687	4,619	7,570	11,909	14,571	16,216	17,086	16,720
Midcareer Investigator Award in Patient-Oriented Research (K24)	—	—	—	1,054	2,072	2,877	4,058	4,368	3,815	3,929	4,315
Mentored Quantitative Research Career Development Award (K25)	—	—	—	—	—	272	921	1,195	1,622	2,206	2,184
Clinical Research Curriculum Award (K30)	—	—	—	1,772	3,163	3,073	3,090	3,110	3,115	4,589	3,708
Total, Research Career Program Obligations	**$33,862**	**$33,912**	**$36,069**	**$47,669**	**$54,184**	**$57,470**	**$63,514**	**$65,817**	**$67,794**	**$71,018**	**$70,365**

NHLBI Minority Biomedical Research Training, Career Development, and Research Supplements Program Obligations: Fiscal Years 1996–2006



NHLBI Minority Biomedical Research Training, Career Development, and Research Supplements Program Obligations: Fiscal Years 1996–2006

	Dollars (Thousands)										
	Fiscal Year										
	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
MARC Summer Research Training Program	$ 32	$ 17	$ —	$ 10	$ 4	$ 20	$ 15	$ 4	$ —	$ —	$ —
Mentored Research Scientist Development Award for Minority Faculty	—	460	1,723	2,738	3,650	5,556	5,711	6,156	6150	6,088	5,453
MARC	5	5	5	—	5	5	—	—	—	—	—
Minority Biomedical Research Support (MBRS)	2,503	2,722	2,978	3,423	3,873	3,165	2,793	3,600	2,806	2,846	2,403
Minority Institution Faculty Mentored Research Scientist Development Award	—	106	101	905	1,300	1,143	1,703	991	867	588	567
Minority Institution Research Training Program	679	898	706	901	1,167	996	1,092	1,006	734	1,184	743
Minority Predoctoral Fellowship	551	388	436	345	248	264	278	308	374	545	1,012
Minority Research Supplements Program	6,714	7,070	7,043	7,440	8,304	8,587	9,822	9,323	10,938	11,214	10,680
Minority School Faculty Development Award	1,158	729	618	445	862	98	—	—	—	—	—
Reentry Supplements	140	152	249	106	176	384	—	—	—	96	132
Research Development Award for Minority Faculty	3,607	3,468	3,099	2,093	393	—	—	—	—	—	—
Short-Term Training for Minority Students	1,834	1,612	1,964	2,494	2,570	1,876	2,057	2,594	2671	2,976	2,526
Total, Minority Programs	**$17,223**	**$17,627**	**$18,922**	**$20,900**	**$22,552**	**$22,094**	**$23,471**	**$23,982**	**$24,540**	**$25,537**	**$23,516**

NHLBI Research Supplements Program by Award Type: Fiscal Years 1996–2006

Number of Awards

	Fiscal Year										
	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Minority Supplements											
Investigator	42	38	31	32	33	33	46	47	35	29	27
Postdoctoral	49	47	50	47	42	41	33	38	37	52	49
Graduate	37	36	48	53	47	43	45	57	61	80	74
Undergraduate	12	23	25	17	19	12	17	18	17	12	11
High School	8	9	11	6	—	3	3	4	3	7	3
Post-Master/Post-Baccalaureate	—	—	—	—	—	—	2	8	17	16	11
Reentry Supplements	2	2	3	2	1	3	—	—	3	2	1
Disability Supplements	3	3	2	1	5	4	5	4	3	2	2
Total, Research Supplements Program	**153**	**158**	**170**	**158**	**147**	**139**	**151**	**176**	**176**	**200**	**178**

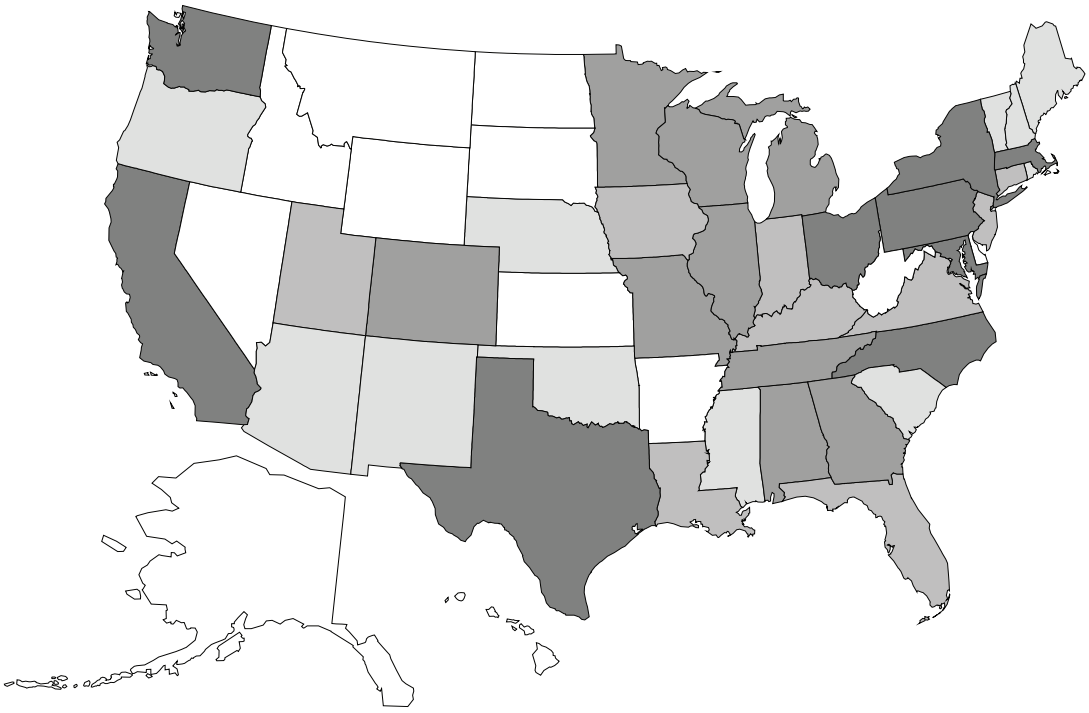
NHLBI Research Supplements Program Obligations by Award Type: Fiscal Years 1996-2006

Dollars (Thousands)

	Fiscal Year										
	1996	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Minority Supplements											
Investigator	$2,552	$2,412	$2,185	$2,331	$3,262	$3,430	$ 5,046	$3,844	$ 4,256	$ 3,552	$ 3,343
Postdoctoral	2,899	3,172	3,032	3,110	3,053	3,086	2,554	2,655	2,713	3,432	3,542
Graduate	1,116	1,181	1,527	1,806	1,791	1,818	1,864	2,181	2,439	3,208	3,114
Undergraduate	120	273	246	166	198	235	260	301	282	179	178
High School	27	32	53	27	—	18	33	33	13	30	18
Post-Master/Post-Baccalaureate	—	—	—	—	—	—	65	309	597	618	352
Reentry Supplements	140	152	249	106	176	384	—	—	495	96	132
Disability Supplements	194	165	96	72	282	187	474	360	143	99	133
Total, Research Supplements Program	**$7,048**	**$7,387**	**$7,388**	**$7,618**	**$8,762**	**$9,158**	**$10,296**	**$9,683**	**$10,938**	**$11,214**	**$10,812**

14. Geographic Distribution of Awards: Fiscal Year 2006

Geographic Distribution of Awards by State: Fiscal Year 2006



Geographic Distribution of Awards by State or Country: Fiscal Year 2006

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Alabama								
Auburn University at Auburn	1	$ 320,781	1	$ 320,781	—	$ —	—	$ —
CFD Research Corporation	1	464,660	1	464,660	—	—	—	—
Cooper Green Hospital, Birmingham	1	568,626	1	568,626	—	—	—	—
Elgavish Paramagnetics, Inc.	2	268,570	2	268,570	—	—	—	—
Researchsouth, Inc.	1	459,332	1	459,332	—	—	—	—
University of Alabama at Birmingham	64	33,272,995	55	27,264,952	6	1,470,410	3	4,537,633
University of South Alabama	17	6,017,964	16	5,836,741	1	181,223	—	—
Total Alabama	**87**	**41,372,928**	**77**	**35,183,662**	**7**	**1,651,633**	**3**	**4,537,633**
Alaska								
Norton Sound Health Corporation	1	476,093	1	476,093	—	—	—	—
Total Alaska	**1**	**476,093**	**1**	**476,093**	**—**	**—**	**—**	**—**
Arizona								
Arizona State University	3	609,856	3	609,856	—	—	—	—
ImaRx Therapeutics, Inc.	1	402,876	1	402,876	—	—	—	—
Mayo Clinic, Arizona	3	817,265	2	759,229	1	58,036	—	—
Orthologic Corporation	1	280,375	1	280,375	—	—	—	—
Translational Genomics Research Institute	2	797,500	2	797,500	—	—	—	—
University of Arizona	29	8,084,189	26	7,472,582	3	611,607	—	—
Total Arizona	**39**	**10,992,061**	**35**	**10,322,418**	**4**	**669,643**	**—**	**—**
Arkansas								
Arkansas Children's Hospital Research Institute	1	155,250	1	155,250	—	—	—	—
University of Arkansas for Medical Sciences, Little Rock	6	1,930,340	6	1,930,340	—	—	—	—
Total Arkansas	**7**	**2,085,590**	**7**	**2,085,590**	**—**	**—**	**—**	**—**
California								
Advanced Brain Monitoring, Inc.	1	427,888	1	427,888	—	—	—	—
Affymetrix, Inc.	1	2,000,000	—	—	—	—	1	2,000,000
Biotechplex Corporation	1	329,544	1	329,544	—	—	—	—
Blaufuss Medical Multimedia Laboratories	1	366,760	1	366,760	—	—	—	—
Blood Systems Research Institute	3	1,905,933	2	1,368,793	—	—	1	537,140
Burnham Institute for Medical Research	7	5,252,758	7	5,252,758	—	—	—	—
California Institute of Technology	3	1,076,662	2	1,026,234	1	50,428	—	—
California Pacific Medical Center Research Institute	2	898,959	2	898,959	—	—	—	—
California State Polytechnic University, Pomona	—	161,868	—	161,868	—	—	—	—
California State University, San Bernardino	—	62,423	—	62,423	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
California State University, Northridge	1	214,500	1	214,500	—	—	—	—
Cedars-Sinai Medical Center	6	4,213,863	6	4,213,863	—	—	—	—
Cerus Corporation	1	100,000	1	100,000	—	—	—	—
Charles R. Drew University of Medicine and Science	—	63,328	—	63,328	—	—	—	—
Children's Hospital and Research Center at Oakland	15	8,202,609	13	8,037,986	1	108,427	1	56,196
Children's Hospital of Los Angeles	18	9,609,414	18	9,609,414	—	—	—	—
Children's Hospital of Orange County	1	44,502	—	—	1	44,502	—	—
City of Hope/Beckman Research Institute	4	1,626,501	4	1,626,501	—	—	—	—
Cytograft Tissue Engineering, Inc.	1	901,757	1	901,757	—	—	—	—
Diagnostics for the Real World, Ltd	2	799,647	2	799,647	—	—	—	—
Fallbrook Engineering, Inc.	1	915,644	1	915,644	—	—	—	—
Fibrogen, Inc.	1	295,969	1	295,969	—	—	—	—
Good Samaritan Hospital	1	298,687	1	298,687	—	—	—	—
HTD BioSystems, Inc.	1	364,440	1	364,440	—	—	—	—
Ichor Medical Systems, Inc.	1	133,980	1	133,980	—	—	—	—
J. David Gladstone Institutes	9	4,684,955	9	4,684,955	—	—	—	—
Kaiser Foundation Research Institute	8	9,018,228	7	7,759,380	—	—	1	1,258,848
Keck Graduate Institute of Applied Life Sciences	1	369,849	1	369,849	—	—	—	—
LA Biomedical Research Institute at Harbor-UCLA Medical Center	12	4,051,486	10	3,843,755	—	—	2	207,731
La Jolla Bioengineering Institute	1	497,625	1	497,625	—	—	—	—
La Jolla Institute for Molecular Medicine	3	1,015,606	3	1,015,606	—	—	—	—
LDM Associates	1	657,467	1	657,467	—	—	—	—
Loma Linda University	2	603,188	2	603,188	—	—	—	—
Los Angeles Orthopaedic Foundation	1	350,222	1	350,222	—	—	—	—
March of Dimes Birth Defects Foundation	1	317,162	1	317,162	—	—	—	—
Maxwell Sensors, Inc.	1	215,235	1	215,235	—	—	—	—
National Childhood Cancer Foundation	1	364,041	1	364,041	—	—	—	—
Neurion Pharmaceuticals, Inc.	1	249,170	1	249,170	—	—	—	—
Northern California Institute for Research and Education	9	6,900,821	9	6,900,821	—	—	—	—
Omicia, Inc.	1	182,732	1	182,732	—	—	—	—
OPAP, Inc.	1	103,403	1	103,403	—	—	—	—
Pacific Tuberculosis/Cancer Research Organization	1	415,751	1	415,751	—	—	—	—
Palo Alto Institute for Research and Education, Inc.	1	308,250	1	308,250	—	—	—	—
Portola Pharmaceuticals, Inc.	1	422,650	1	422,650	—	—	—	—
Proteomtech, Inc.	1	100,000	1	100,000	—	—	—	—
Quasar, Inc.	2	219,957	2	219,957	—	—	—	—
Rand Corporation	1	190,661	1	190,661	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Salk Institute for Biological Studies	1	638,372	1	638,372	—	—	—	—
SAM Technology, Inc.	1	414,758	1	414,758	—	—	—	—
San Diego State University	10	6,468,909	10	6,468,909	—	—	—	—
Scripps Research Institute	32	16,916,901	30	16,537,382	2	379,519	—	—
Sidney Kimmel Cancer Center	2	1,251,157	2	1,251,157	—	—	—	—
SRI International	1	490,257	1	490,257	—	—	—	—
Stanford University	69	32,227,000	54	28,587,325	14	1,833,049	1	1,806,626
Torrey Pines Institute for Molecular Studies	1	444,308	1	444,308	—	—	—	—
Touro University California	1	248,550	1	248,550	—	—	—	—
University of California, Berkeley	7	2,525,171	6	2,462,049	1	63,122	—	—
University of California, Davis	31	10,844,521	29	10,422,993	2	421,528	—	—
University of California, Irvine	17	5,411,393	14	5,184,561	2	90,452	1	136,380
University of California, Lawrence Berkeley National Laboratory	8	6,190,173	7	6,020,612	1	169,561	—	—
University of California, Los Angeles	65	35,249,914	54	31,032,806	9	1,359,897	2	2,857,211
University of California, Riverside	1	360,962	1	360,962	—	—	—	—
University of California, San Diego	86	42,122,407	73	38,494,191	12	2,503,216	1	1,125,000
University of California, San Francisco	91	36,871,747	83	34,731,838	6	1,555,263	2	584,646
University of California, Santa Barbara	4	1,051,769	3	1,002,973	1	48,796	—	—
University of Southern California	28	10,916,087	26	10,807,366	2	108,721	—	—
Vala Sciences, Inc.	1	249,866	1	249,866	—	—	—	—
Ventria Bioscience	1	99,500	1	99,500	—	—	—	—
Veterans Medical Research Foundation, San Diego	4	3,018,053	4	3,018,053	—	—	—	—
Vitalog, Inc.	1	111,950	1	111,950	—	—	—	—
Volcano Corporation	2	664,169	2	664,169	—	—	—	—
Total California	**598**	**286,293,989**	**530**	**266,987,730**	**55**	**8,736,481**	**13**	**10,569,778**
Colorado								
Advanced Microlabs, LLC	1	101,400	1	101,400	—	—	—	—
Colorado State University, Fort Collins	2	234,823	2	234,823	—	—	—	—
Denver Health and Hospital Authority	2	1,384,859	2	1,384,859	—	—	—	—
Kestrel Labs, Inc.	2	1,460,498	2	1,460,498	—	—	—	—
National Jewish Medical and Research Center	21	10,003,992	19	9,902,968	2	101,024	—	—
Pulmonary Alveolar Proteinosis Foundation	1	15,000	1	15,000	—	—	—	—
Rocky Mountain Biosystems, Inc.	2	274,889	2	274,889	—	—	—	—
University of Colorado	1	332,750	—	—	—	—	1	332,750
University of Colorado at Boulder	7	2,089,420	6	1,904,046	1	185,374	—	—
University of Colorado at Denver and Health Science Center, Aurora	58	25,750,667	47	19,907,696	8	2,019,880	3	3,823,091
University of Colorado, Denver	1	67,811	—	—	—	—	1	67,811
Total Colorado	**98**	**41,716,109**	**82**	**35,186,179**	**11**	**2,306,278**	**5**	**4,223,652**

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Connecticut								
Protein Sciences Corporation	1	315,204	—	—	—	—	1	315,204
University of Connecticut School of Medicine and Dental Medicine	15	7,116,343	15	7,116,343	—	—	—	—
University of Connecticut, Storrs	1	337,869	1	337,869	—	—	—	—
Yale University	64	31,320,165	52	26,523,885	11	2,449,033	1	2,347,247
Total Connecticut	**81**	**39,089,581**	**68**	**33,978,097**	**11**	**2,449,033**	**2**	**2,662,451**
Delaware								
Compact Membrane Systems, Inc.	1	169,639	1	169,639	—	—	—	—
University of Delaware	2	683,767	2	683,767	—	—	—	—
Total Delaware	**3**	**853,406**	**3**	**853,406**	**—**	**—**	**—**	**—**
District of Columbia								
Academy for Educational Development	1	850,000	—	—	—	—	1	850,000
American Institutes for Research	3	2,795,927	—	—	—	—	3	2,795,927
American Society of Hematology	1	20,000	1	20,000	—	—	—	—
Children's Research Institute	3	1,313,067	3	1,313,067	—	—	—	—
George Washington University	8	3,130,015	8	3,130,015	—	—	—	—
Georgetown University	14	4,324,196	14	4,324,196	—	—	—	—
Howard University	8	3,324,486	5	3,046,010	1	119,174	2	159,302
Ogilvy Public Relations Worldwide	2	3,830,918	—	—	—	—	2	3,830,918
U.S. Bureau of the Census	1	444,000	—	—	—	—	1	444,000
Total District of Columbia	**41**	**20,032,609**	**31**	**11,833,288**	**1**	**119,174**	**9**	**8,080,147**
Florida								
Altor Bioscience Corporation	1	1,037,283	1	1,037,283	—	—	—	—
Florida Atlantic University	1	240,098	1	240,098	—	—	—	—
Florida Institute of Technology	1	315,288	1	315,288	—	—	—	—
Florida International University	—	469,851	—	469,851	—	—	—	—
H. Lee Moffitt Cancer Center and Research Institute	1	133,920	1	133,920	—	—	—	—
Nemours Children's Clinic	1	149,883	1	149,883	—	—	—	—
University of Central Florida	1	225,385	1	225,385	—	—	—	—
University of Florida	45	17,047,115	42	16,839,826	3	207,289	—	—
University of Miami, Coral Gables	2	938,948	1	611,050	1	327,898	—	—
University of Miami Medical School	14	5,087,767	12	4,844,681	1	50,428	1	192,658
University of South Florida	3	918,423	3	918,423	—	—	—	—
Total Florida	**70**	**26,563,961**	**64**	**25,785,688**	**5**	**585,615**	**1**	**192,658**
Georgia								
Bresagen, Inc.	—	81,828	—	81,828	—	—	—	—
Emory University	57	22,453,327	49	21,750,146	7	657,281	1	45,900

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Expression Therapeutics	1	100,000	1	100,000	—	—	—	—
Georgia Institute of Technology	6	2,991,494	5	2,933,958	1	57,536	—	—
Georgia State University	2	424,665	2	424,665	—	—	—	—
Medical College of Georgia	31	13,625,018	29	13,273,861	2	351,157	—	—
Morehouse School of Medicine	13	5,384,885	12	5,057,026	1	327,859	—	—
Transfusion & Transplantation Technologies, Inc.	1	99,510	1	99,510	—	—	—	—
University of Georgia	1	48,796	—	—	1	48,796	—	—
U.S. Centers for Disease Control and Prevention	2	975,000	—	—	—	—	2	975,000
Wake Forest University	1	142,500	—	—	—	—	1	142,500
Total Georgia	**115**	**46,327,023**	**99**	**43,720,994**	**12**	**1,442,629**	**4**	**1,163,400**
Hawaii								
Pacific Health Research Institute	2	915,546	2	915,546	—	—	—	—
Queen's Medical Center	1	585,900	1	585,900	—	—	—	—
University of Hawaii at Hilo	—	220,905	—	220,905	—	—	—	—
University of Hawaii at Manoa	4	1,809,931	3	1,763,955	1	45,976	—	—
Total Hawaii	**7**	**3,532,282**	**6**	**3,486,306**	**1**	**45,976**	**—**	**—**
Illinois								
American College of Chest Physicians	—	5,000	—	5,000	—	—	—	—
Children's Memorial Hospital, Chicago	2	887,403	2	887,403	—	—	—	—
Evanston Northwestern Healthcare Research Institute	4	1,414,802	3	1,368,826	1	45,976	—	—
Hektoen Institute for Medical Research	1	577,329	1	577,329	—	—	—	—
Illinois Institute of Technology	1	315,391	1	315,391	—	—	—	—
Loyola University, Chicago	15	7,598,787	15	7,598,787	—	—	—	—
Northwestern University	69	27,523,569	62	24,511,222	5	986,484	2	2,025,863
Rush University Medical Center	11	4,208,139	10	4,040,108	—	—	1	168,031
University of Chicago	50	18,361,211	45	16,887,537	5	1,473,674	—	—
University of Illinois at Chicago	57	24,891,191	49	22,994,252	7	1,827,662	1	69,277
University of Illinois, Urbana-Champaign	2	787,047	2	787,047	—	—	—	—
Total Illinois	**212**	**86,569,869**	**190**	**79,972,902**	**18**	**4,333,796**	**4**	**2,263,171**
Indiana								
General Biotechnology, LLC	1	133,734	1	133,734	—	—	—	—
Indiana University-Purdue University at Indianapolis	58	20,916,390	53	20,238,319	5	678,071	—	—
Purdue University, West Lafayette	3	894,171	3	894,171	—	—	—	—
SonarMed, Inc.	1	660,725	1	660,725	—	—	—	—
Space Hardware Optimization Technology, Inc.	1	299,680	1	299,680	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
University of Notre Dame	5	3,160,829	5	3,160,829	—	—	—	—
Total Indiana	**69**	**26,065,529**	**64**	**25,387,458**	**5**	**678,071**	**—**	**—**
Iowa								
Maharishi University of Management	1	494,906	1	494,906	—	—	—	—
University of Iowa	70	32,757,822	63	30,159,794	7	2,598,028	—	—
VIDA Diagnostics, Inc.	2	453,110	2	453,110	—	—	—	—
Total Iowa	**73**	**33,705,838**	**66**	**31,107,810**	**7**	**2,598,028**	**—**	**—**
Kansas								
Kansas State University	1	178,308	1	178,308	—	—	—	—
Nanoscale Materials, Inc.	1	200,000	1	200,000	—	—	—	—
University of Kansas, Lawrence	1	205,768	1	205,768	—	—	—	—
University of Kansas Medical Center	7	2,756,319	6	2,725,300	1	31,019	—	—
Total Kansas	**10**	**3,340,395**	**9**	**3,309,376**	**1**	**31,019**	**—**	**—**
Kentucky								
SCR, Inc.	1	172,749	1	172,749	—	—	—	—
University of Kentucky	25	8,623,408	24	8,497,543	1	125,865	—	—
University of Louisville	28	10,578,836	26	10,369,597	2	209,239	—	—
VitaTech, LLC	1	1,056,652	1	1,056,652	—	—	—	—
Total Kentucky	**55**	**20,431,645**	**52**	**20,096,541**	**3**	**335,104**	**—**	**—**
Louisiana								
Children's Hospital, New Orleans	—	214,500	—	214,500	—	—	—	—
Louisiana State University and Agricultural and Mechanical College, Baton Rouge	1	350,743	1	350,743	—	—	—	—
Louisiana State University Health Science Center	1	434,187	—	—	—	—	1	434,187
Louisiana State University Health Sciences Center, New Orleans	9	4,998,456	8	4,932,364	—	—	1	66,092
Louisiana State University Health Sciences Center, Shreveport	4	990,510	4	990,510	—	—	—	—
Louisiana State University Pennington Biomedical Research Center	4	1,808,338	4	1,808,338	—	—	—	—
Ochsner Clinic Foundation	1	278,303	1	278,303	—	—	—	—
Tulane University of Louisiana	18	11,447,829	16	11,212,162	2	235,667	—	—
Total Louisiana	**38**	**20,522,866**	**34**	**19,786,920**	**2**	**235,667**	**2**	**500,279**
Maine								
Jackson Laboratory	9	5,658,768	8	5,513,030	1	145,738	—	—
Maine Medical Center	4	1,372,161	4	1,372,161	—	—	—	—
University of Maine, Orono	1	666,979	1	666,979	—	—	—	—
Total Maine	**14**	**7,697,908**	**13**	**7,552,170**	**1**	**145,738**	**—**	**—**

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Maryland								
Active Signal Technologies, Inc.	1	145,574	1	145,574	—	—	—	—
American Academy of Health Behavior	1	10,000	1	10,000	—	—	—	—
American Institutes for Research	1	2,643,549	—	—	—	—	1	2,643,549
American Physiological Society	1	20,000	1	20,000	—	—	—	—
American Society for Cell Biology	1	10,000	1	10,000	—	—	—	—
American Society for Investigative Pathology	1	10,000	1	10,000	—	—	—	—
BioAssessments, LLC	1	149,999	1	149,999	—	—	—	—
Bon Secours Hospital, Baltimore	1	581,824	1	581,824	—	—	—	—
Clinical Trials and Surveys Corporation	2	2,589,729	—	—	—	—	2	2,589,729
Constella Group, Inc.	1	572,045	—	—	—	—	1	572,045
EMMES Corporation	3	1,611,970	1	439,392	—	—	2	1,172,578
Federation of American Societies for Experimental Biology	2	27,000	2	27,000	—	—	—	—
Hager Sharp, Inc.	1	708,076	—	—	—	—	1	708,076
Henry M. Jackson Foundation for the Advancement of Military Medicine	4	2,537,390	2	627,909	1	264,041	1	1,645,440
IM Systems	1	493,089	1	493,089	—	—	—	—
Infinite Biomedical Technologies, LLC	1	993,158	1	993,158	—	—	—	—
Intronn, Inc.	1	1,489,114	1	1,489,114	—	—	—	—
J. Craig Venter Institute	1	1,945,324	—	—	—	—	1	1,945,324
Johns Hopkins University	160	79,244,199	134	68,346,170	18	4,123,132	8	6,774,897
Kennedy Krieger Research Institute	1	10,000	1	10,000	—	—	—	—
Maryland Medical Research Institute	—	324,920	—	324,920	—	—	—	—
MasiMax Resources, Inc.	1	439,000	—	—	—	—	1	439,000
MaxCyte, Inc.	1	116,893	1	116,893	—	—	—	—
Medstar Research Institute	5	5,068,238	5	5,068,238	—	—	—	—
National Cancer Institute	2	185,000	—	—	—	—	2	185,000
National Center for Health Statistics	1	973,000	—	—	—	—	1	973,000
National Center for Research Resources	2	1,838,045	—	—	—	—	2	1,838,045
National Institute of Child Health and Human Development	1	2,400,000	—	—	—	—	1	2,400,000
National Institute of Diabetes and Digestive and Kidney Diseases	3	5,303,000	—	—	—	—	3	5,303,000
National Institutes of Health	1	10,783,654	—	—	—	—	1	10,783,654
North American Vascular Biology Organization	1	15,000	1	15,000	—	—	—	—
Panacea Pharmaceuticals, Inc.	1	610,479	1	610,479	—	—	—	—
Peace Technology, Inc.	1	2,259,127	—	—	—	—	1	2,259,127
Perinatronics Medical Systems, Inc.	1	904,434	1	904,434	—	—	—	—
Primary Care Coalition/Montgomery County	1	148,750	1	148,750	—	—	—	—
Prolias, LLC	1	100,539	1	100,539	—	—	—	—
Pulmonary Hypertension Association	1	10,000	1	10,000	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Seracare Bioservices	1	1,031,572	—	—	—	—	1	1,031,572
Suburban Hospital	1	4,473,400	—	—	—	—	1	4,473,400
U.S. Department of Health and Human Services	10	3,629,965	—	—	—	—	10	3,629,965
U.S. Food and Drug Administration	2	400,000	—	—	—	—	2	400,000
University of Maryland Baltimore Professional School	39	16,733,622	35	15,834,659	3	772,592	1	126,371
University of Maryland Biotechnology Institute	1	362,526	1	362,526	—	—	—	—
Westat, Inc.	1	8,000,149	—	—	—	—	1	8,000,149
Total Maryland	**265**	**161,903,353**	**198**	**96,849,667**	**22**	**5,159,765**	**45**	**59,893,921**
Massachusetts								
ABIOMED, Inc.	1	416,551	1	416,551	—	—	—	—
ACell, Inc.	1	102,950	1	102,950	—	—	—	—
Aeris Therapeutics, Inc.	1	463,709	1	463,709	—	—	—	—
Baystate Medical Center	2	478,082	—	—	—	—	2	478,082
Beth Israel Deaconess Medical Center	53	24,780,796	47	23,805,645	6	975,151	—	—
BioSurfaces	2	749,998	2	749,998	—	—	—	—
Boston Biomedical Research Institute	9	3,792,394	8	3,736,542	1	55,852	—	—
Boston Medical Center	20	11,614,935	20	11,614,935	—	—	—	—
Boston University	10	14,937,101	8	2,573,769	—	—	2	12,363,332
Boston University Medical Campus	51	28,088,349	44	25,931,031	7	2,157,318	—	—
Brandeis University	1	105,220	1	105,220	—	—	—	—
Brigham and Women's Hospital	122	54,433,022	104	50,798,073	18	3,634,949	—	—
Cardium Pharmaceuticals, Inc.	1	329,175	1	329,175	—	—	—	—
Caritas St. Elizabeth's Medical Center	6	2,610,742	6	2,610,742	—	—	—	—
CBR Institute for Biomedical Research	7	10,141,337	7	10,141,337	—	—	—	—
Children's Hospital Boston	46	18,720,167	39	17,193,647	7	1,526,520	—	—
Dana-Farber Cancer Institute	15	5,862,020	15	5,862,020	—	—	—	—
DecImmune Therapeutics, Inc.	1	129,156	1	129,156	—	—	—	—
Education Development Center, Inc.	1	592,574	1	592,574	—	—	—	—
EIC Laboratories, Inc.	1	419,033	1	419,033	—	—	—	—
Gwathmey, Inc.	1	1,613,011	1	1,613,011	—	—	—	—
Harvard Pilgrim Health Care, Inc.	2	770,956	2	770,956	—	—	—	—
Harvard University	2	484,305	1	476,802	1	7,503	—	—
Harvard University Medical School	12	4,426,922	8	3,116,759	4	1,310,163	—	—
Harvard University School of Public Health	29	13,449,584	24	12,707,850	5	741,734	—	—
Immunetics, Inc.	1	995,238	1	995,238	—	—	—	—
Infoscitex Corporation	1	925,939	1	925,939	—	—	—	—
Joslin Diabetes Center	2	992,433	2	992,433	—	—	—	—
Levitronix, LLC	3	1,364,229	3	1,364,229	—	—	—	—
Massachusetts Eye and Ear Infirmary	1	125,982	1	125,982	—	—	—	—
Massachusetts General Hospital	69	29,385,934	65	26,645,695	3	1,203,443	1	1,536,796

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Massachusetts Institute of Technology	13	8,132,762	9	5,206,477	3	136,768	1	2,789,517
Microbiotix, Inc.	1	367,815	1	367,815	—	—	—	—
Neuroprotection	1	178,840	1	178,840	—	—	—	—
New England Medical Center Hospitals	25	20,262,637	22	19,342,836	1	611,784	2	308,017
New England Research Institutes, Inc.	6	15,415,528	5	9,935,838	—	—	1	5,479,690
Newton Laboratories	2	465,947	2	465,947	—	—	—	—
NMT Medical, Inc.	1	12,500	1	12,500	—	—	—	—
Northeastern University	3	790,044	3	790,044	—	—	—	—
Physical Sciences, Inc.	1	210,921	1	210,921	—	—	—	—
QuitNet.com, Inc.	1	308,551	1	308,551	—	—	—	—
Radiation Monitoring Devices, Inc.	2	224,018	2	224,018	—	—	—	—
Spaulding Rehabilitation Hospital	1	157,353	1	157,353	—	—	—	—
Sunnybrook and Women's College Health Sciences Center	1	372,902	1	372,902	—	—	—	—
Tufts University, Boston	11	3,208,001	9	2,920,453	2	287,548	—	—
University of Massachusetts, Amherst	1	322,375	1	322,375	—	—	—	—
University of Massachusetts Medical School, Worcester	21	7,665,557	20	7,535,141	1	130,416	—	—
Verax Biomedical, Inc.	1	1,000,000	1	1,000,000	—	—	—	—
Whitehead Institute for Biomedical Research	2	99,224	—	—	2	99,224	—	—
Total Massachusetts	**568**	**292,496,819**	**498**	**256,663,012**	**61**	**12,878,373**	**9**	**22,955,434**
Michigan								
Accumed Systems, Inc.	1	109,589	1	109,589	—	—	—	—
Henry Ford Health System	13	6,162,728	13	6,162,728	—	—	—	—
Hope College	1	153,500	1	153,500	—	—	—	—
MC3, Inc.	4	1,756,575	4	1,756,575	—	—	—	—
MedArray, Inc.	1	585,180	1	585,180	—	—	—	—
Michigan State University	12	3,932,707	11	3,883,911	1	48,796	—	—
Neural Intervention Technologies, Inc.	1	515,649	1	515,649	—	—	—	—
Pixel Velocity, Inc.	1	209,603	1	209,603	—	—	—	—
St. Joseph Mercy Oakland	2	773,099	2	773,099	—	—	—	—
Thromgen, Inc.	1	606,945	1	606,945	—	—	—	—
TSRL, Inc.	1	274,452	1	274,452	—	—	—	—
University of Michigan at Ann Arbor	92	39,634,781	84	36,150,912	6	1,269,187	2	2,214,682
Wayne State University	16	4,563,771	15	4,431,557	—	—	1	132,214
Total Michigan	**146**	**59,278,579**	**136**	**55,613,700**	**7**	**1,317,983**	**3**	**2,346,896**
Minnesota								
Advanced Circulatory Systems, Inc.	4	1,813,781	4	1,813,781	—	—	—	—
Discovery Genomics, Inc.	1	649,762	1	649,762	—	—	—	—
Gel-Del Technologies, Inc.	1	1,031,981	1	1,031,981	—	—	—	—
HealthPartners Research Foundation	1	287,091	1	287,091	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Koronis Biomedical Technologies Corporation	1	127,084	1	127,084	—	—	—	—
Mayo Clinic College of Medicine, Rochester	67	28,148,164	60	24,881,073	4	346,758	3	2,920,333
Minneapolis Medical Research Foundation, Inc.	1	346,182	1	346,182	—	—	—	—
Minnesota State University, Moorhead	—	16,464	—	16,464	—	—	—	—
Minnesota Veterans Research Institute	1	503,990	1	503,990	—	—	—	—
Phygen, Inc.	1	880,589	1	880,589	—	—	—	—
Powerscope, Inc.	1	99,887	1	99,887	—	—	—	—
University of Minnesota, Twin Cities	68	30,855,582	58	24,872,856	6	1,794,973	4	4,187,753
ZirChrom Separations, Inc.	1	348,525	1	348,525	—	—	—	—
Total Minnesota	**148**	**65,109,082**	**131**	**55,859,265**	**10**	**2,141,731**	**7**	**7,108,086**
Mississippi								
Jackson Hinds Comprehensive Health Center	1	587,914	1	587,914	—	—	—	—
Jackson State University	1	3,186,000	—	—	—	—	1	3,186,000
Tougaloo College	1	14,326	—	—	—	—	1	14,326
University of Mississippi Medical Center	14	6,059,620	10	5,266,380	2	78,378	2	714,862
University of Southern Mississippi	1	182,500	1	182,500	—	—	—	—
Total Mississippi	**18**	**10,030,360**	**12**	**6,036,794**	**2**	**78,378**	**4**	**3,915,188**
Missouri								
APT Therapeutics, Inc.	1	336,745	1	336,745	—	—	—	—
Children's Mercy Hospital, Kansas City	2	418,324	2	418,324	—	—	—	—
St. Louis University	9	2,761,894	9	2,761,894	—	—	—	—
University of Missouri, Kansas City	1	1	1	1	—	—	—	—
University of Missouri, Columbia	20	7,478,970	18	7,397,682	2	81,288	—	—
ViraCor Holdings, LLC	1	299,000	1	299,000	—	—	—	—
Washington University	119	60,219,818	108	57,278,462	11	2,941,356	—	—
Total Missouri	**153**	**71,514,752**	**140**	**68,492,108**	**13**	**3,022,644**	**—**	**—**
Montana								
Montana State University, Bozeman	1	397,057	1	397,057	—	—	—	—
University of Montana	5	530,240	4	472,204	1	58,036	—	—
Total Montana	**6**	**927,297**	**5**	**869,261**	**1**	**58,036**	**—**	**—**
Nebraska								
Creighton University	4	717,578	3	678,039	1	39,539	—	—
University of Nebraska, Lincoln	1	1,954,305	1	1,954,305	—	—	—	—
University of Nebraska Medical Center	8	3,794,007	8	3,794,007	—	—	—	—
Ximerex, Inc.	1	526,344	1	526,344	—	—	—	—
Total Nebraska	**14**	**6,992,234**	**13**	**6,952,695**	**1**	**39,539**	**—**	**—**

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Nevada								
Nevada Cancer Institute	1	330,573	1	330,573	—	—	—	—
Sierra Biomedical Research Corporation	1	435,774	1	435,774	—	—	—	—
University of Nevada at Reno	9	2,872,310	9	2,872,310	—	—	—	—
Total Nevada	**11**	**3,638,657**	**11**	**3,638,657**	**—**	**—**	**—**	**—**
New Hampshire								
Creare, Inc.	2	643,008	2	643,008	—	—	—	—
Dartmouth College	18	5,849,454	18	5,849,454	—	—	—	—
Xemed, LLC	2	500,219	2	500,219	—	—	—	—
Total New Hampshire	**22**	**6,992,681**	**22**	**6,992,681**	**—**	**—**	**—**	**—**
New Jersey								
Advanced Liquid Crystal Technologies, Inc.	1	232,725	1	232,725	—	—	—	—
COECare.com, LLC	1	114,820	1	114,820	—	—	—	—
DVX, LLC	1	535,046	1	535,046	—	—	—	—
Hackensack University Medical Center	2	652,376	2	652,376	—	—	—	—
Princeton Multimedia Technologies Corp.	1	509,260	1	509,260	—	—	—	—
Public Health Research Institute	1	136,710	1	136,710	—	—	—	—
Rutgers, The State University of New Jersey, New Brunswick	1	346,688	1	346,688	—	—	—	—
University of Medicine and Dentistry of New Jersey	21	10,707,298	17	9,805,073	3	693,436	1	208,789
University of Medicine and Dentistry of New Jersey, R. W. Johnson Medical School	5	3,793,254	5	3,793,254	—	—	—	—
Vasade Biosciences, Inc.	1	145,499	1	145,499	—	—	—	—
Xechem, Inc.	1	473,181	1	473,181	—	—	—	—
Total New Jersey	**36**	**17,646,857**	**32**	**16,744,632**	**3**	**693,436**	**1**	**208,789**
New Mexico								
Department of Veterans Affairs, Albuquerque	1	4,565,817	—	—	—	—	1	4,565,817
Diné College	—	370,983	—	370,983	—	—	—	—
Lovelace Biomedical and Environmental Research	6	2,279,518	5	2,251,761	1	27,757	—	—
Sandia National Laboratories	1	144,784	1	144,784	—	—	—	—
Southwest Sciences, Inc.	1	406,163	1	406,163	—	—	—	—
University of New Mexico	11	4,482,569	9	4,303,347	2	179,222	—	—
Total New Mexico	**20**	**12,249,834**	**16**	**7,477,038**	**3**	**206,979**	**1**	**4,565,817**
New York								
Aaron Diamond AIDS Research Center	1	614,122	1	614,122	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Albany Medical College of Union University	8	2,610,315	6	2,046,516	2	563,799	—	—
Albany Research Institute, Inc.	1	244,125	1	244,125	—	—	—	—
Angion Biomedica Corporation	2	1,818,718	2	1,818,718	—	—	—	—
City College of New York	2	893,531	2	893,531	—	—	—	—
Clarkson University	1	182,119	1	182,119	—	—	—	—
Cold Spring Harbor Laboratory	1	15,000	1	15,000	—	—	—	—
Columbia University	81	42,035,172	74	39,863,977	6	1,460,455	1	710,740
Cornell University, Ithaca	12	5,325,988	11	5,275,560	1	50,428	—	—
CUNY Graduate School and University Center	1	338,796	1	338,796	—	—	—	—
Dawkins Productions, Inc.	1	382,539	1	382,539	—	—	—	—
Feinstein Institute for Medical Research	6	2,194,750	6	2,194,750	—	—	—	—
Gene Network Sciences, Inc.	1	539,718	1	539,718	—	—	—	—
Graduate College of Union University	—	80,000	—	80,000	—	—	—	—
Hospital for Special Surgery	1	425,744	1	425,744	—	—	—	—
Jarvik Heart, Inc.	1	1,366,936	—	—	—	—	1	1,366,936
Masonic Medical Research Laboratory, Inc	2	566,700	2	566,700	—	—	—	—
Mohawk Innovative Technology, Inc.	2	1,345,649	2	1,345,649	—	—	—	—
Montefiore Medical Center, Bronx	1	310,881	1	310,881	—	—	—	—
Mount Sinai School of Medicine of New York University	22	9,028,532	20	8,928,176	2	100,356	—	—
Narrows Institute for Biomedical Research Inc.	1	293,683	1	293,683	—	—	—	—
New York Academy of Medicine	1	557,763	1	557,763	—	—	—	—
New York Blood Center	3	978,261	3	978,261	—	—	—	—
New York Medical College	14	7,220,195	14	7,220,195	—	—	—	—
New York University School of Medicine	27	11,166,881	22	10,655,075	5	511,806	—	—
Queens College	1	379,609	1	379,609	—	—	—	—
Regeneron Pharmaceuticals, Inc.	—	1,000,000	—	1,000,000	—	—	—	—
Rensselaer Polytechnic Institute	1	381,529	1	381,529	—	—	—	—
Rockefeller University	5	1,950,536	4	1,900,108	1	50,428	—	—
Roswell Park Cancer Institute Corporation	1	454,905	1	454,905	—	—	—	—
Sloan-Kettering Institute for Cancer Research	6	1,677,982	6	1,677,982	—	—	—	—
St. John's University	1	707,752	1	707,752	—	—	—	—
St. Luke's-Roosevelt Institute for Health Sciences	8	3,104,874	7	3,056,078	1	48,796	—	—
State University of New York at Buffalo	17	5,883,425	16	5,865,039	1	18,386	—	—
State University of New York at Stony Brook	16	5,016,572	16	5,016,572	—	—	—	—
SUNY Downstate Medical Center	3	749,210	3	749,210	—	—	—	—
SUNY Upstate Medical University	9	5,155,864	9	5,155,864	—	—	—	—
Syracuse University	1	365,254	1	365,254	—	—	—	—
Therasource, LLC	1	149,995	1	149,995	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Trudeau Institute, Inc.	1	437,500	1	437,500	—	—	—	—
University of Rochester	50	23,134,058	47	22,157,975	3	976,083	—	—
Visiting Nurse Service of New York	1	787,084	1	787,084	—	—	—	—
Weill Medical College of Cornell University	41	19,537,885	37	18,857,705	4	680,180	—	—
Winifred Masterson Burke Medical Research Institute	1	464,310	1	464,310	—	—	—	—
Winthrop-University Hospital	2	474,748	2	474,748	—	—	—	—
Yeshiva University	33	15,468,204	26	15,035,592	6	292,576	1	140,036
Zylon Corporation	1	708,695	1	708,695	—	—	—	—
Total New York	**393**	**178,526,109**	**358**	**171,555,104**	**32**	**4,753,293**	**3**	**2,217,712**
North Carolina								
BioMarck Pharmaceuticals, Ltd.	1	1,000,000	1	1,000,000	—	—	—	—
BreathQuant Medical Systems, Inc.	1	99,996	1	99,996	—	—	—	—
CryoFacets, Inc.	1	99,995	1	99,995	—	—	—	—
Duke University	125	67,801,219	108	65,172,945	14	2,066,828	3	561,446
Heart Imaging Technologies, LLC	1	268,441	1	268,441	—	—	—	—
North Carolina Central University	2	727,141	2	727,141	—	—	—	—
North Carolina State University at Raleigh	6	1,784,443	4	1,471,879	2	312,564	—	—
Parion Sciences	1	983,544	1	983,544	—	—	—	—
Rho Federal Systems Division, Inc.	3	6,566,023	2	5,344,351	—	—	1	1,221,672
RTI International	1	1,391,748	—	—	—	—	1	1,391,748
Southeast TechInventures	1	382,063	1	382,063	—	—	—	—
Tribofilm Research, Inc.	1	269,148	1	269,148	—	—	—	—
University of North Carolina at Chapel Hill	81	42,806,457	71	35,709,804	7	1,121,760	3	5,974,893
University of North Carolina at Charlotte	1	439,493	1	439,493	—	—	—	—
Vascular Pharmaceuticals	1	210,260	1	210,260	—	—	—	—
Wake Forest University	9	7,195,904	4	1,299,407	—	—	5	5,896,497
Wake Forest University Health Sciences	42	20,227,019	36	19,077,585	4	531,125	2	618,309
Total North Carolina	**278**	**152,252,894**	**236**	**132,556,052**	**27**	**4,032,277**	**15**	**15,664,565**
North Dakota								
University of North Dakota	1	289,871	1	289,871	—	—	—	—
Total North Dakota	**1**	**289,871**	**1**	**289,871**	**—**	**—**	**—**	**—**
Ohio								
Arteriocyte, Inc.	1	1,229,607	1	1,229,607	—	—	—	—
BIOMEC, Inc.	2	1,804,542	2	1,804,542	—	—	—	—
Case Western Reserve University	62	24,155,315	49	21,306,504	13	2,848,811	—	—
ChanTest, Inc.	1	149,322	1	149,322	—	—	—	—
ChanXpress, Inc.	1	247,711	1	247,711	—	—	—	—
Children's Hospital Medical Center of Cincinnati	52	25,539,354	51	25,503,166	1	36,188	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Children's Research Institute	4	894,476	4	894,476	—	—	—	—
Cleveland Clinic Foundation	1	343,289	—	—	—	—	1	343,289
Cleveland Clinic Lerner College of Medicine of Case Western Reserve University	50	29,291,842	48	27,986,214	—	—	2	1,305,628
Cleveland Medical Devices, Inc.	2	1,062,441	2	1,062,441	—	—	—	—
Cleveland State University	3	581,996	2	551,029	1	30,967	—	—
Deca-Medics, Inc.	1	474,589	1	474,589	—	—	—	—
Interventional Imaging, Inc.	1	207,987	1	207,987	—	—	—	—
Medical University of Ohio at Toledo	6	6,244,080	6	6,244,080	—	—	—	—
MetroHealth Medical Center	1	329,570	1	329,570	—	—	—	—
NanoMimetics, Inc.	1	197,716	1	197,716	—	—	—	—
Ohio State University	34	9,881,050	33	9,823,624	1	57,426	—	—
Ohio University, Athens	1	350,392	1	350,392	—	—	—	—
University of Akron	1	358,864	1	358,864	—	—	—	—
University of Cincinnati	41	17,413,747	39	16,754,858	2	658,889	—	—
University of Toledo	1	46,413	—	—	1	46,413	—	—
Wright State University	6	2,344,716	4	2,187,702	2	157,014	—	—
Total Ohio	**273**	**123,149,019**	**249**	**117,664,394**	**21**	**3,835,708**	**3**	**1,648,917**
Oklahoma								
Oklahoma Medical Research Foundation	3	2,420,907	3	2,420,907	—	—	—	—
Oklahoma State University, Stillwater	3	958,930	3	958,930	—	—	—	—
University of Oklahoma Health Sciences Center	14	5,885,545	13	5,819,709	1	65,836	—	—
Total Oklahoma	**20**	**9,265,382**	**19**	**9,199,546**	**1**	**65,836**	**—**	**—**
Oregon								
C/J Media, Inc.	1	121,986	1	121,986	—	—	—	—
Fanconi Anemia Research Fund, Inc.	1	14,500	1	14,500	—	—	—	—
Oregon Health and Science University	37	12,938,685	31	12,246,755	6	691,930	—	—
Oregon Research Institute	3	1,341,833	3	1,341,833	—	—	—	—
Oregon State University	2	600,797	2	600,797	—	—	—	—
Total Oregon	**44**	**15,017,801**	**38**	**14,325,871**	**6**	**691,930**	**—**	**—**
Pennsylvania								
Adult Congenital Heart Association	1	10,000	1	10,000	—	—	—	—
Allegheny-Singer Research Institute	2	573,506	2	573,506	—	—	—	—
Apogee Biotechnology Corporation	1	219,476	1	219,476	—	—	—	—
CardiacAssist, Inc.	1	441,138	1	441,138	—	—	—	—
Carnegie Mellon University	2	584,870	2	584,870	—	—	—	—
CASurgica, Inc.	1	398,437	1	398,437	—	—	—	—
Children's Hospital of Philadelphia	38	23,924,279	36	23,431,388	2	492,891	—	—
Children's Hospital of Pittsburgh	10	4,456,223	9	4,408,071	—	—	1	48,152

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
CollaGenex Pharmaceuticals, Inc.	1	243,353	1	243,353	—	—	—	—
Drexel University	8	1,847,908	7	1,847,907	1	1	—	—
Ension, Inc.	4	1,886,762	3	894,876	—	—	1	991,886
Fox Chase Cancer Center	5	1,910,245	5	1,910,245	—	—	—	—
Franklin and Marshall College	1	189,948	1	189,948	—	—	—	—
Industrial Science and Technology Network	1	736,368	1	736,368	—	—	—	—
Lankenau Institute for Medical Research	1	390,600	1	390,600	—	—	—	—
Magee-Women's Health Corporation	1	150,000	—	—	1	150,000	—	—
National Disease Research Interchange	—	24,412	—	24,412	—	—	—	—
Octagen Corporation	1	1,004,225	1	1,004,225	—	—	—	—
Pennsylvania State University, Milton S. Hershey Medical Center	20	12,337,222	19	11,059,411	—	—	1	1,277,811
Pennsylvania State University, University Park	3	860,371	3	860,371	—	—	—	—
PhenoTech, Inc.	1	509,517	1	509,517	—	—	—	—
PinMed, Inc.	1	492,200	1	492,200	—	—	—	—
Temple University	23	8,076,909	20	7,505,764	3	571,145	—	—
The Institute for Transfusion Medicine	1	371,860	—	—	—	—	1	371,860
Thomas Jefferson University	20	8,278,267	19	8,247,254	1	31,013	—	—
University of Pennsylvania	128	64,351,285	111	59,951,886	16	4,285,068	1	114,331
University of Pittsburgh at Pittsburgh	105	51,922,221	93	45,602,164	9	1,275,878	3	5,044,179
Weis Center for Research, Geisinger Clinic	1	361,894	1	361,894	—	—	—	—
Wistar Institute	3	2,063,561	3	2,063,561	—	—	—	—
Total Pennsylvania	**385**	**188,617,057**	**344**	**173,962,842**	**33**	**6,805,996**	**8**	**7,848,219**
Rhode Island								
Brown University	7	3,042,321	6	3,024,221	1	18,100	—	—
Gordon Research Conferences	5	52,000	5	52,000	—	—	—	—
Memorial Hospital of Rhode Island	1	236,247	1	236,247	—	—	—	—
Miriam Hospital	8	3,350,372	7	3,169,618	1	180,754	—	—
Pro-Change Behavior Systems, Inc.	1	133,510	1	133,510	—	—	—	—
QualityMetric, Inc.	1	137,540	1	137,540	—	—	—	—
Rhode Island Hospital, Providence	8	4,156,356	8	4,156,356	—	—	—	—
Roger Williams Hospital	2	575,287	2	575,287	—	—	—	—
Women and Infants Hospital of Rhode Island	—	114,368	—	114,368	—	—	—	—
Total Rhode Island	**33**	**11,798,001**	**31**	**11,599,147**	**2**	**198,854**	**—**	**—**
South Carolina								
Cell and Tissue Systems, Inc.	1	170,764	1	170,764	—	—	—	—
Clemson University	3	749,865	3	749,865	—	—	—	—
Iron Disorders Institute, Inc.	1	2,000	1	2,000	—	—	—	—
Medical University of South Carolina	28	10,144,981	23	8,812,056	4	876,755	1	456,170

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
University of South Carolina at Columbia	9	3,746,153	9	3,746,153	—	—	—	—
Total South Carolina	**42**	**14,813,763**	**37**	**13,480,838**	**4**	**876,755**	**1**	**456,170**
South Dakota								
Black Hills Center/American Indian Health	1	306,473	1	306,473	—	—	—	—
Missouri Breaks Research, Inc.	2	1,170,061	2	1,170,061	—	—	—	—
South Dakota Health Research Foundation	1	270,174	1	270,174	—	—	—	—
University of South Dakota	2	721,621	2	721,621	—	—	—	—
Total South Dakota	**6**	**2,468,329**	**6**	**2,468,329**	**—**	**—**	**—**	**—**
Tennessee								
East Tennessee State University	4	1,099,631	4	1,099,631	—	—	—	—
Meharry Medical College	6	1,593,531	2	1,000,618	4	592,913	—	—
St. Jude Children's Research Hospital	10	10,242,936	9	9,786,282	—	—	1	456,654
University of Memphis	6	2,075,436	6	2,075,436	—	—	—	—
University of Tennessee Health Sciences Center	29	9,365,699	28	9,065,743	1	299,956	—	—
University of Tennessee at Knoxville	2	495,234	2	495,234	—	—	—	—
Vanderbilt University	83	39,007,254	70	36,621,822	11	1,949,990	2	435,442
Veterans Affairs Medical Center, Memphis	1	2,494,032	—	—	—	—	1	2,494,032
Viral Antigens, Inc.	1	666,950	—	—	—	—	1	666,950
Total Tennessee	**142**	**67,040,703**	**121**	**60,144,766**	**16**	**2,842,859**	**5**	**4,053,078**
Texas								
Baylor College of Medicine	79	27,653,257	62	22,675,767	13	2,268,797	4	2,708,693
Cooper Institute	2	229,678	2	229,678	—	—	—	—
CorInnova, Inc.	1	362,708	1	362,708	—	—	—	—
Methodist Hospital Research Institute	2	569,059	2	569,059	—	—	—	—
Rice University	5	1,240,543	5	1,240,543	—	—	—	—
Scott and White Memorial Hospital	1	136,080	1	136,080	—	—	—	—
Southwest Foundation for Biomedical Research	7	8,142,508	6	7,982,034	—	—	1	160,474
Texas A&M University Health Science Center	11	5,096,741	11	5,096,741	—	—	—	—
Texas A&M University System	2	224,577	2	224,577	—	—	—	—
Texas Agricultural Experiment Station	3	1,087,192	3	1,087,192	—	—	—	—
Texas Engineering Experiment Station	1	295,392	1	295,392	—	—	—	—
Texas Southern University	1	487,653	1	487,653	—	—	—	—
Texas Tech University Health Sciences Center	2	306,444	2	306,444	—	—	—	—
University of North Texas	1	352,761	1	352,761	—	—	—	—
University of North Texas Health Sciences Center	6	1,782,419	5	1,646,641	1	135,778	—	—
University of Texas at Arlington	1	211,333	1	211,333	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
University of Texas at Austin	1	367,164	1	367,164	—	—	—	—
University of Texas at Dallas	3	785,832	3	785,832	—	—	—	—
University of Texas at San Antonio	1	276,350	1	276,350	—	—	—	—
University of Texas Health Sciences Center at Houston	21	17,183,850	20	17,126,476	1	57,374	—	—
University of Texas Health Sciences Center at San Antonio	18	7,233,182	17	7,181,134	1	52,048	—	—
University of Texas Health Sciences Center at Tyler	8	3,438,255	8	3,438,255	—	—	—	—
University of Texas M.D. Anderson Cancer Center	12	3,741,255	11	3,692,459	1	48,796	—	—
University of Texas Medical Branch at Galveston	11	4,598,718	9	2,649,047	1	85,633	1	1,864,038
University of Texas Southwestern Medical Center at Dallas	53	28,503,578	49	24,998,373	3	1,275,666	1	2,229,539
Total Texas	**253**	**114,306,529**	**225**	**103,419,693**	**21**	**3,924,092**	**7**	**6,962,744**
Utah								
Frontier Scientific, Inc.	1	432,432	1	432,432	—	—	—	—
IHC Health Services, Inc.	1	566,567	1	566,567	—	—	—	—
LDS Hospital	2	516,067	—	—	—	—	2	516,067
Thrombodyne, Inc.	1	956,997	1	956,997	—	—	—	—
University of Utah	47	16,576,350	42	15,757,373	5	818,977	—	—
Utah Artificial Heart Institute	1	994,884	1	994,884	—	—	—	—
Total Utah	**53**	**20,043,297**	**46**	**18,708,253**	**5**	**818,977**	**2**	**516,067**
Vermont								
Haematologic Technologies, Inc.	2	491,881	2	491,881	—	—	—	—
Psychological Applications, LLC	1	420,718	1	420,718	—	—	—	—
University of Vermont and State Agricultural College	37	13,800,220	31	12,561,742	6	1,238,478	—	—
Total Vermont	**40**	**14,712,819**	**34**	**13,474,341**	**6**	**1,238,478**	**—**	**—**
Virginia								
American Psychosomatic Society	1	10,000	1	10,000	—	—	—	—
Barron Associates, Inc.	1	124,966	1	124,966	—	—	—	—
Bioengineering Consultants, Ltd.	1	197,875	1	197,875	—	—	—	—
College of William and Mary	2	419,540	2	419,540	—	—	—	—
CW Optics, Inc.	1	713,005	1	713,005	—	—	—	—
Eastern Virginia Medical School	1	331,400	1	331,400	—	—	—	—
Empirical Technologies Corporation	1	379,804	1	379,804	—	—	—	—
Institute for Alternative Futures	1	150,585	—	—	—	—	1	150,585
McGuire Research Institute, Inc.	1	309,404	1	309,404	—	—	—	—
PocketSonics	1	149,970	1	149,970	—	—	—	—
Society for Prevention Research, Inc.	—	5,000	—	5,000	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Talisman, Ltd.	1	927,498	1	927,498	—	—	—	—
The Lewin Group	1	743,712	—	—	—	—	1	743,712
U.S. National Science Foundation	1	200,000	—	—	—	—	1	200,000
University of Virginia, Charlottesville	50	22,648,868	41	21,224,763	8	1,397,907	1	26,198
Virginia Commonwealth University	15	5,049,009	15	5,049,009	—	—	—	—
Virginia Polytechnic Institute and State University	—	48,825	—	48,825	—	—	—	—
Total Virginia	**79**	**32,409,461**	**67**	**29,891,059**	**8**	**1,397,907**	**4**	**1,120,495**
Washington								
Asthma, Inc.	1	311,420	1	311,420	—	—	—	—
Axio Research Corporation	1	4,699,630	1	4,699,630	—	—	—	—
Barlow Scientific	1	100,000	1	100,000	—	—	—	—
Battelle Pacific Northwest Laboratories	1	1,932,141	1	1,932,141	—	—	—	—
Benaroya Research Institute at Virginia Mason	1	48,796	—	—	1	48,796	—	—
Center for Health Studies	1	675,452	1	675,452	—	—	—	—
Children's Hospital and Regional Medical Center	6	2,617,950	6	2,617,950	—	—	—	—
E.I. SpeCentera, LLC	1	352,326	1	352,326	—	—	—	—
Fred Hutchinson Cancer Research Center	19	20,252,644	18	12,372,986	—	—	1	7,879,658
Inologic, Inc.	1	320,995	1	320,995	—	—	—	—
Insilicos, LLC	2	398,300	2	398,300	—	—	—	—
Institute for Systems Biology	2	2,770,670	1	123,011	—	—	1	2,647,659
Phantoms by Design, Inc.	2	582,572	2	582,572	—	—	—	—
Pro-Tech Services, Inc.	1	199,052	1	199,052	—	—	—	—
Puget Sound Blood Center	5	3,034,221	4	2,976,685	1	57,536	—	—
Seattle Institute for Cardiac Research	1	2,114,588	1	2,114,588	—	—	—	—
Spencer Technologies	2	410,882	2	410,882	—	—	—	—
Syntrix Biosystems, Inc.	1	705,130	1	705,130	—	—	—	—
University of Washington	121	68,435,708	108	59,836,663	8	3,189,371	5	5,409,674
VisionGate, Inc.	1	160,342	1	160,342	—	—	—	—
Washington State University	4	1,518,271	4	1,518,271	—	—	—	—
Total Washington	**175**	**111,641,090**	**158**	**92,408,396**	**10**	**3,295,703**	**7**	**15,936,991**
West Virginia								
West Virginia University	10	3,749,010	10	3,749,010	—	—	—	—
Total West Virginia	**10**	**3,749,010**	**10**	**3,749,010**	**—**	**—**	**—**	**—**
Wisconsin								
American Society of Gene Therapy	1	10,000	1	10,000	—	—	—	—
Blood Center of Southeastern Wisconsin	8	4,579,630	7	4,470,235	1	109,395	—	—
Marquette University	1	212,389	1	212,389	—	—	—	—
Medical College of Wisconsin	58	33,868,324	54	31,470,519	3	377,576	1	2,020,229

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Minitube of America	1	118,125	1	118,125	—	—	—	—
Quantum Tubers Corporation	1	100,000	1	100,000	—	—	—	—
University of Wisconsin, Madison	47	20,990,583	42	19,522,101	5	1,468,482	—	—
WiCell Research Institute	—	97,650	—	97,650	—	—	—	—
Total Wisconsin	**117**	**59,976,701**	**107**	**56,001,019**	**9**	**1,955,453**	**1**	**2,020,229**
Puerto Rico								
University of Puerto Rico, Mayaguez	—	163,531	—	163,531	—	—	—	—
University of Puerto Rico, Medical Sciences	1	877,628	1	877,628	—	—	—	—
Total Puerto Rico	**1**	**1,041,159**	**1**	**1,041,159**	—	—	—	—
Total U.S.	**5,370**	**$2,547,569,182**	**4,733**	**$2,265,241,828**	**468**	**$88,694,867**	**169**	**$193,632,487**
Australia								
Baker Heart Research Institute	1	270,000	1	270,000	—	—	—	—
ES Cell International Pte Ltd.	—	97,650	—	97,650	—	—	—	—
James Cook University of North Queensland	1	263,655	1	263,655	—	—	—	—
St. Vincent's Hospital, Melbourne	1	210,924	1	210,924	—	—	—	—
University of Melbourne	1	195,300	1	195,300	—	—	—	—
University of Sydney	1	204,674	1	204,674	—	—	—	—
Walter and Eliza Hall Institute of Medical Research	2	506,655	2	506,655	—	—	—	—
Total Australia	**7**	**1,748,858**	**7**	**1,748,858**	**—**	**—**	**—**	**—**
Belgium								
Flanders Interuniversity Institute of Biotechnology	1	170,888	1	170,888	—	—	—	—
Free University of Brussels	1	290,021	1	290,021	—	—	—	—
Total Belgium	**2**	**460,909**	**2**	**460,909**	**—**	**—**	**—**	**—**
Canada								
Clinical Research Institute of Montreal	1	290,020	1	290,020	—	—	—	—
Hospital for Sick Children, Toronto	3	661,907	3	661,907	—	—	—	—
McMaster University	1	2,497,313	—	—	—	—	1	2,497,313
Montreal Heart Institute	1	270,000	1	270,000	—	—	—	—
Ottawa Health Research Institute	1	177,647	1	177,647	—	—	—	—
St. Michael's Hospital	1	202,122	1	202,122	—	—	—	—
University Health Network	1	1	1	1	—	—	—	—
University of Alberta	3	359,584	3	359,584	—	—	—	—
University of British Columbia	1	263,655	1	263,655	—	—	—	—
University of Calgary	3	866,309	3	866,309	—	—	—	—
University of Manitoba	1	162,000	1	162,000	—	—	—	—
University of Montreal	2	446,480	2	446,480	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
University of Toronto	—	80,000	—	80,000	—	—	—	—
Total Canada	**19**	**6,277,038**	**18**	**3,779,725**	**—**	**—**	**1**	**2,497,313**
China								
Chinese Center, Disease Control and Prevention	—	23,729	—	23,729	—	—	—	—
Total China	**—**	**23,729**	**—**	**23,729**	**—**	**—**	**—**	**—**
Finland								
University of Helsinki	1	263,655	1	263,655	—	—	—	—
Total Finland	**1**	**263,655**	**1**	**263,655**	**—**	**—**	**—**	**—**
Hungary								
Eotvos Lorand University	—	39,060	—	39,060	—	—	—	—
Total Hungary	**—**	**39,060**	**—**	**39,060**	**—**	**—**	**—**	**—**
India								
Center for DNA Fingerprinting/Diagnostics	—	38,083	—	38,083	—	—	—	—
Total India	**—**	**38,083**	**—**	**38,083**	**—**	**—**	**—**	**—**
Israel								
Hadassah-Hebrew University Medical Center	1	58,036	—	—	1	58,036	—	—
Technion-Israel Institute of Technology	1	347,682	1	347,682	—	—	—	—
Total Israel	**2**	**405,718**	**1**	**347,682**	**1**	**58,036**	**—**	**—**
Netherlands								
Erasmus University of Rotterdam	1	210,924	1	210,924	—	—	—	—
State University at Groningen	1	263,655	1	263,655	—	—	—	—
Wageningen University	1	377,508	1	377,508	—	—	—	—
Total Netherlands	**3**	**852,087**	**3**	**852,087**	**—**	**—**	**—**	**—**
Sweden								
Uppsala University	1	158,193	1	158,193	—	—	—	—
Total Sweden	**1**	**158,193**	**1**	**158,193**	**—**	**—**	**—**	**—**
Thailand								
Chiang Mai University	—	15,819	—	15,819	—	—	—	—
Total Thailand	**—**	**15,819**	**—**	**15,819**	**—**	**—**	**—**	**—**

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
United Kingdom								
Imperial College London	1	150,653	—	—	—	—	1	150,653
Royal Free and University College Medical School	1	209,753	1	209,753	—	—	—	—
University of Bristol	1	469,356	1	469,356	—	—	—	—
University of Cambridge	1	270,000	1	270,000	—	—	—	—
University of London University College, London	2	518,124	2	518,124	—	—	—	—
Total United Kingdom	**6**	**1,617,886**	**5**	**1,467,233**	**—**	**—**	**1**	**150,653**
Total Other	**41**	**$ 11,901,035**	**38**	**$ 9,195,033**	**1**	**$ 58,036**	**2**	**$ 2,647,966**
Grand Total	**5,411**	**$2,559,470,217**	**4,771**	**$2,274,436,861**	**469**	**$88,752,903**	**171**	**$196,280,453**

Appendixes

Types of Research Activity

List of Abbreviations and Acronyms

Index

Types of Research Activity

Research Projects

Research Project Grants (R01): To support discrete and specific projects to be performed by one or several investigators in areas of the investigator's particular interests and competencies.

Research Projects (Cooperative Agreements) (U01): To support discrete, circumscribed projects in areas of an investigator's specific interest and competency involving substantial programmatic participation by the NHLBI during performance of the activity.

Research Program Projects (P01): To support broadly based, multidisciplinary, often long-term research projects that have specific major objectives or basic themes directed toward a well-defined research program goal. Usually, a relatively large, organized group of researchers conducts individual subprojects, the results of which help achieve objectives of the program project.

Small Research Grants (R03): To provide limited support for extended analyses of research data generated by clinical trials, population research, and demonstration and education studies.

Academic Research Enhancement Awards (AREA) (R15): To support small-scale research projects conducted by faculty in primarily baccalaureate degree-granting domestic institutions. Awards are for up to $75,000 for direct costs (plus applicable indirect costs) for periods not to exceed 36 months.

Exploratory/Developmental Grants (R21): To encourage the development of new research activities in heart, lung, and blood diseases and sleep disorders program areas.

First Independent Research Support and Transition (FIRST) Award (R29): To provide a sufficient initial period of research support for newly independent biomedical investigators to develop their research capabilities and demonstrate the merit of their research ideas. New grants are no longer awarded.

Exploratory/Developmental Grant (R33): To provide phase II support for innovative exploratory and developmental research activities initiated under the R21 mechanism.

Method To Extend Research in Time (MERIT) Award (R37): To provide long-term research grant support to investigators whose research competency and productivity are distinctly superior and thus are likely to continue to perform in an outstanding manner. Investigators may not apply for a MERIT award; instead, they are selected by the NHLBI on the basis of their current grant applications and their present and past grant support.

NIH Director's Pioneer Award (DP1): To support individual scientists of exceptional creativity who propose pioneering approaches to major contemporary challenges in biomedical research.

Small Business Technology Transfer (STTR) Grants—Phase I (R41): To support cooperative R&D projects between small business concerns and research institutions, limited in time and amount, to establish the technical merit and feasibility of ideas that have potential for commercialization. Awards are made to small business concerns only.

Small Business Technology Transfer (STTR) Grants—Phase II (R42): To support in-depth development of cooperative R&D projects between small business concerns and research institutions, limited in time and amount, whose feasibility has been established in phase I and that have potential for commercialization. Awards are made to small business concerns only.

Small Business Innovation Research (SBIR) Grants, Phase I (R43): To support projects, limited in time and amount, to establish the technical merit and feasibility of research and development ideas

that may ultimately lead to commercial products or services.

Small Business Innovation Research (SBIR) Grants, Phase II (R44): To support research project ideas that have been shown to be feasible in phase I and that are likely to result in commercially marketable products or services.

Research Centers

Exploratory Grants (P20): To support planning for new programs, expansion or modification of existing resources, and feasibility studies to explore various approaches to the development of interdisciplinary programs that offer potential solutions to problems of special significance to the mission of the NHLBI.

Center Core Grants (P30): To support shared resources and facilities for basic, clinical, behavioral, and translational research in the prevention, detection, and treatment of HIV infection and AIDS.

Animal (Mammalian and Nonmammalian) Model and Animal and Material Resource Grant (P40): To develop and support animal models, or animal or biological materials resources. Nonmammalian resources include nonmammalian vertebrates, invertebrates, cell systems, and nonbiological systems.

Specialized Centers of Research (SCOR) Grants (P50): To support both basic and clinical research related to an Institute-identified theme. The spectrum of SCOR activities comprises multidisciplinary approaches to specific disease entities or biomedical problem areas. The SCOR grants differ from research program projects in that they are in response to an announcement of programmatic needs of the Institute. Centers may be asked to perform additional studies because of urgently needed information or may serve as a regional or national resource for special purpose research.

Comprehensive Specialized Research Center Grants (U54): To support a large, interrelated biomedical research program focused on a disorder within the Institute's mandate; to initiate and expand community education, screening, and counseling programs; and to educate medical and allied health professionals concerning problems of diagnosis and treatment of specific diseases such as sickle cell anemia.

Research Career Programs

Mentored Research Scientist Development Award for Minority Faculty (K01): To support underrepresented minority faculty members with varying levels of research experience to prepare them for research careers as independent investigators.

Mentored Scientist Development Award in Research Ethics (K01): To provide support for training in research ethics for health professionals working at academic and other health-related institutions in biomedical, behavioral, or public health research, particularly research involving human participants.

Minority Institution Faculty Mentored Research Scientist Development Award (K01): To support faculty members at minority institutions who have the interest and potential to conduct state-of-the-art research in cardiovascular, pulmonary, or hematologic disease, or in sleep disorders.

Independent Scientist Award (K02): To enhance the research capability of promising individuals in the formative stages of their careers of independent research in the sciences related to heart, lung, and blood diseases; blood resources; and sleep disorders.

Research Career Development Award (K04): To foster the development of young scientists with outstanding research potential for careers of independent research in the sciences related to heart, lung, and blood diseases and blood resources. New grants are no longer awarded.

Research Career Award (K06): To assist institutions in supporting established investigators of high competency for the duration of their careers. New grants are no longer awarded.

Academic Award (K07): To support an individual with an academic appointment to introduce or improve a disease curriculum that will enhance the academic or research environment of the applicant institution as well as further the individual's own career. This award series includes the Preventive Cardiology Academic Award, the Preventive Pulmonary Academic Award, the Transfusion Medicine Academic Award, and the Systemic Pulmonary and Vascular Diseases Academic Awards, the Asthma Academic Award, the Tuberculosis Academic Award, the Sleep Academic Award, the Nutrition Academic Award,

and the Cultural Competence and Health Disparities Academic Award. Currently, the Cultural Competence and Health Disparities Academic Award program is being supported.

Clinical Investigator Development Award (K08): To provide an opportunity for clinically trained physicians to develop research skills and gain experience in advanced research methods and experimental approaches in basic and applied sciences relevant to cardiovascular, pulmonary, and hematological diseases. This award was developed to encourage clinical investigators to engage in research in specific areas designated by the Institute.

Physician Scientist Award (K11): To encourage newly trained clinicians to develop independent research skills and experience in one of the fundamental sciences. New grants are no longer awarded.

Research Career Development Program in Vascular Medicine (12): To promote comprehensive clinical research training for physicans wanting to specialize in vascular medicine. The goal is to prepare clinicians for academic roles in mentoring and leadership in clinical research in vascular medicine.

Research Career Development Program in Clinical Hematology (12): To develop and evaluate multidisciplinary career development programs in clinical hematology research that will equip new academic researchers with the knowledge and skills to address complex problems in blood diseases, transfusion medicine, and cellular therapies.

Minority School Faculty Development Award (K14): To develop faculty investigators at minority schools and to enhance their research capabilities in areas related to heart, lung, and blood diseases; blood resources; and sleep disorders. New grants are no longer awarded.

Research Development Award for Minority Faculty (K14): To encourage the development of minority faculty investigators and to enhance their research capabilities in areas related to cardiovascular, lung, and blood health and disease; transfusion medicine; and sleep disorders. New grants are no longer awarded.

Career Enhancement Award for Stem Cell Research (K18): To enable established investigators to acquire new research capabilities in the use of human or animal embryonic, adult, or cord blood stem cells. All candidates must have a sponsor, either within their own or at another institution, who is a well-qualified stem cell expert to serve as a mentor.

NHLBI Career Transition Award (K22): To support the postdoctoral research training of an outstanding individual in an NHLBI intramural laboratory for up to 3 years and subsequently, to support the individual's successful transition from postdoctoral research to an extramural environment as an independent researcher.

Mentored Patient-Oriented Research Career Development Award (K23): To provide support for career development to investigators who have made a commitment to focus their research endeavors on patient-oriented research.

Midcareer Investigator Award in Patient-Oriented Research (K24): To provide support for clinicians to allow them "protected time" to devote to patient-oriented research and to act as mentors for beginning clinical investigators.

Mentored Quantitative Research Career Development Award (K25): To provide support to investigators with quantitative science or engineering backgrounds who have made a commitment to focus their research on basic or clinical biomedicine, bioengineering, bioimaging, or behavioral sciences.

Clinical Research Curriculum Award (CRCA) (K30): To stimulate inclusion of high-quality, multidisciplinary didactic training in fundamental skills, methodology, theories, and conceptualization as part of the career development of clinical investigators.

Other Research Grants

Scientific Evaluation (R09): To provide funds to the chairman of an initial review group for operation of the review group.

Resource-Related Research Projects (R24): To support research projects that will enhance the capability of resources to serve biomedical research in areas related to cardiovascular, lung, and blood health and diseases; blood resources; and sleep disorders.

Cooperative Clinical Research (R10) (U10): To support studies and evaluations of relevant clinical problems. These grants usually involve collaborative efforts among several institutions and principal investigators and are conducted under a formal protocol.

Conference Grants (R13): To support national and international scientific meetings, conferences, or workshops at which research is discussed.

Research Demonstration and Education Projects (R18): To provide support designed to develop, test, and evaluate health-related activities and to foster application of existing knowledge to the control of heart, lung, and blood diseases and sleep disorders.

Education Projects (R25): To provide support for the development and implementation of a program as it relates to a category in one or more of the areas of education, information, training, technical assistance, coordination, or evaluation.

Minority Biomedical Research Support Grants (S06) (S14): To strengthen the biomedical research and research training capability of minority institutions and to assist in increasing the involvement of minority faculty and students in biomedical research.

Biomedical Research Support Grants (S07): To strengthen, balance, and stabilize supported biomedical and behavioral research programs through flexible funds that permit institutions to respond quickly and effectively to emerging needs and opportunities; to enhance creativity and innovation, to support pilot studies, and to improve research resources.

Continuing Education Training Grant (T15): To assist professional schools and other public and nonprofit institutions to establish, expand, or improve programs of continuing professional education, especially for programs dealing with new scientific developments.

Scientific Review and Evaluation (U09): To support an initial Scientific Review Group responsible for the assessment of scientific and technical merit of grant applications.

Conference (Cooperative Agreements) (U13): To support international, national, or regional meetings; conferences; and workshops where substantial programmatic involvement is planned to assist the recipient.

Resource-Related Research Projects (U24): To support research projects contributing to improvement of the capability of resources to serve biomedical research.

National Swine Research and Resource Center (U42): To support a National Swine Research and Resource Center that will serve as a resource for depositing, maintaining, preserving, and distributing swine models for studies of human diseases, as well as cryopreservation, storage, and reconstitution of embryos and germplasm.

Small Business Innovation Research Cooperative Agreements (U44): To provide support for phase II and fast-track projects that directly address identification and preclinical testing of new therapeutics.

Historical Black College and University Scientist Award (UH1): To strengthen and augment the human resources at historically black colleges and universities (HBCU) by recruiting an established research scientist into their biomedical or behavioral sciences department; to enhance the career of the recruited research scientist; and to strengthen other HBCU resources for the conduct of biomedical or behavioral research in areas related to cardiovascular, lung, and blood health and disease; transfusion medicine; and sleep disorders.

Individual National Research Service Awards (NRSA)

Predoctoral Individual NRSA (F31): To provide predoctoral individuals with supervised research training in areas related to heart, lung, and blood diseases; blood resources; and sleep disorders leading toward the research degree (e.g., Ph.D.).

Postdoctoral Individual NRSA (F32): To provide postdoctoral research training to individuals to broaden their scientific background and extend their potential for research in areas related to heart, lung, and blood diseases and blood resources.

NRSA for Senior Fellows (F33): To provide experienced scientists with an opportunity to make major changes in the direction of their research careers, to broaden their scientific background, to acquire new research capabilities, to enlarge their command of an

allied research field, or to take time from regular professional responsibilities for the purpose of broadening their research capabilities.

Institutional National Research Service Awards (NRSA)

Institutional NRSA (T32): To enable institutions to make awards to individuals selected by them for predoctoral and postdoctoral research training in areas related to heart, lung, and blood diseases; blood resources; and sleep disorders.

Minority Institutional Research Training Program (T32M): To support full-time research training for investigative careers at minority schools in areas of cardiovascular, pulmonary, and hematologic diseases and sleep disorders. Graduate students, postdoctoral students, or health professions students may be supported under this program.

MARC Undergraduate NRSA Institutional Grants (T34): To support institutional training grants for underrepresented minority undergraduates to obtain research training and improve their preparation for graduate training in the biomedical and behavioral sciences.

NRSA Short-Term Research Training (T35 and T35S): To provide individuals with research training during off-quarters or summer periods to encourage research careers or to encourage research in areas of national need. This program includes the Short-Term Training for Minority Students Program and short-term training for students in health professional schools.

MARC Visiting Professors for Minority Institutions (T36): To increase the number of well-trained minority scientists in biomedical disciplines and to strengthen the research and teaching capabilities of minority institutions.

Other Support

Research and Development Contracts (N01): To develop or apply new knowledge or test, screen, or evaluate a product, material, device, or component for use by the scientific community.

Small Business Innovation Research (N43): To support projects, limited in time and amount, to establish the technical merit and feasibility of R&D ideas that may ultimately lead to a commercial product(s) or service(s).

NIH Interagency Agreements (Y01): To provide a source of funds to another Federal agency to acquire specific products, services, or studies.

NIH Intra-Agency Agreements (Y02): To provide a source of funds to another NIH component to acquire specific products, services, or studies.

Minority Research Supplements Programs: To provide supplemental funds to active NHLBI grants to support the research of minority high school, undergraduate, and graduate students; postdoctoral trainees; and investigators.

List of Abbreviations and Acronyms

ACCORD	Action To Control Cardiovascular Risk in Diabetes
ACE	angiotensin-converting enzyme
ACRN	Asthma Clinical Research Network
AI/AN	American Indian/Alaska Native
AIDS	acquired immunodeficiency syndrome
AMI	acute myocardial infarction
APPLES	Apnea Positive Pressure Long-Term Efficacy Study
ARDS	acute respiratory distress syndrome
ARDSNet	Acute Respiratory Distress Syndrome Clinical Network
ARIC	Atherosclerosis Risk in Communities
ATP III	Adult Treatment Panel III
BABY HUG	Pediatric Hydroxyurea Phase III Clinical Trial
BARI 2D	Bypass Angioplasty Revascularization Investigation in Type 2 Diabetics
CABG	coronary artery bypass graft
CAMP–CS /Phase 2	Childhood Asthma Management Program–Continuation Study/Phase 2
CARDIA	Coronary Artery Risk Development in Young Adults
CARE	Childhood Asthma Research and Education Network
CF	cystic fibrosis
CHD	coronary heart disease
CHS	Cardiovascular Health Study
CIHR	Canadian Institutes of Health Research
CTOT	Clinical Trials in Organ Transplantation
COPD	chronic obstructive pulmonary disease
CORAL	Cardiovascular Outcomes in Renal Atherosclerotic Lesions
CRITT	Center for Research Informatics and Information Technology
CSCC	Comprehensive Sickle Cell Centers
CVD	cardiovascular diseases
DASH	Dietary Approaches To Stop Hypertension
DBDR	Division of Blood Diseases and Resources
DCVD	Division of Cardiovascular Diseases
DECA	Division of Epidemiology and Clinical Applications
DERA	Division of Extramural Research Affairs
DHVD	Division of Heart and Vascular Diseases
DIR	Division of Intramural Research
DLD	Division of Lung Diseases
DPPS	Division of Prevention and Population Sciences
EDUC	Enhanced Dissemination and Utilization Center
ESCAPE	Evaluation Study of Congestive Heart Failure and Pulmonary Artery Catheterization Effectiveness

FOCUS	Functional Outcomes in Cardiovascular Patients Undergoing Surgical Hip Fracture Repair
FY	fiscal year
GEMS	Girls Health Enrichment Multisite Studies
GOCADAN	Genetics of Coronary Artery Disease in Alaska Natives
HAT	Home Automatic External Defibrillator Trial
HBCU	historically black colleges and universities
HBV	hepatitis B virus
HCHS	Hispanic Community Health Study
HCV	hepatitis C virus
HF-ACTION	Heart Failure: A Controlled Trial Investigation Outcomes of Exercise Training
HEW	Department of Health, Education, and Welfare (now HHS)
HHS	Health and Human Services (formerly HEW)
HIV	human immunodeficiency virus
HTLV	human T-lymphotropic virus
ICD	International Classification of Diseases
IMMEDIATE	Immediate Myocardial Metabolic Enhancement During Initial Assessment and Treatment in Emergency Care
IT	Information Technology
JHS	Jackson Heart Study
JNC V	Fifth Report of the Joint National Committee on the Detection, Evaluation, and Treatment of High Blood Pressure
MARC	Minority Access to Research Careers
MESA	Multi-Ethnic Study of Atherosclerosis
NAEPP	National Asthma Education and Prevention Program
NCEP	National Cholesterol Education Program
NCHS	National Center for Health Statistics
NCI	National Cancer Institute
NCSDR	National Center on Sleep Disorders Research
NHAAP	National Heart Attack Alert Program
NHANES	National Health and Nutrition Examination Survey
NHBPEP	National High Blood Pressure Education Program
NHI	National Heart Institute
NHLBAC	National Heart, Lung, and Blood Advisory Council
NHLBI	National Heart, Lung, and Blood Institute (formerly NHI and NHLI)
NHLI	National Heart and Lung Institute
NIA	National Institute on Aging
NICHD	National Institute of Child Health and Human Development
NIAMS	National Institute of Arthritis and Musculoskeletal and Skin Diseases

NIDDK	National Institute of Diabetes and Digestive and Kidney Diseases
NIH	National Institutes of Health
NINDS	National Institute of Neurological Disorders and Stroke
NRSA	National Research Service Award
OEI	Obesity Education Initiative
OMHA	Office of Minority Health
OPEC	Office of Prevention, Education, and Control
OSA	obstructive sleep apnea
PA	Program Announcement
PAD	peripheral artery disease
PGA	Programs for Genomic Applications
PHS	Public Health Service
PIOPED	Prospective Investigation of Pulmonary Embolism Diagnosis
POUNDS LOST	Preventing Overweight Using Novel Dietary Strategies
REDS	Retrovirus Epidemiology Donor Study
RFA	Request for Applications
RFP	Request for Proposals
RPG	research project grant
SANDS	Stop Atherosclerosis in Native Diabetics Study
SBIR	Small Business Innovation Research
SCD	sickle cell disease
SCCOR	Specialized Center of Clinically Oriented Research
SCOR	Specialized Center of Research
SDB	sleep disordered breathing
SEP	Special Emphasis Panel
SES	socioeconomic status
SHARE	SNP Health Association Resource
SIDS	sudden infant death syndrome
SNP	single nucleotide polymorphism
STICH	Surgical Treatment for Ischemic Heart Failure
STTR	Small Business Technology Transfer
SWITCH	Stroke With Transfusions Changing to Hydroxyurea
TAAG	Trial of Activity for Adolescent Girls
TB	tuberculosis
TOPCAT	Trial of Aldosterone Antagonists Therapy in Adult With Ejection Fraction Congestive Heart Failure
WHI	Women's Health Initiative
WLM	Weight Loss Maintenance

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