Fact Book

Fiscal Year

2007

February 2008

For Administrative Use

National Institutes

of Health

National Heart, Lung,

and Blood Institute

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

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1. Abbreviated Staff Directory*

Office of the Director	Bldg.	Room	Phone	MSC** †
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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
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Associate Director for Basic Research, **Alan M. Michelson, M.D., Ph.D.**	31	5A48	594–5353	2490
Acting Associate Director for Biomedical Informatics, **Ralph Van Wey**	RKL1‡	6100	435–0116	7994
Associate Director for Minority Health, **Helena O. Mishoe, Ph.D., M.P.H.**	RKL2§	9093C	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	5A07	496–6331	2482
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Office of Biostatistics Research Director, **Nancy L. Geller, Ph.D.**	RKL2	9093A	435–0434	7913
Office of Clinical Research Director, **Maria Stagnitto, M.S.N.**	RKL2	9093B	435–7594	7913
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Acting Deputy Director, **Christopher E. Olaes**	RKL1	6212	496–3275	7994
Administrative Officer, **Amy L. Doster**	RKL2	8095	435–6373	7921
Chief Terminology Officer, **Carol A. Bean, Ph.D.**	31	5A06	435–0114	2490
Applications Development and Support Branch Chief, **Ralph Van Wey**	RKL1	6100	435–0116	7994
Information Technology Resources Branch Chief, **Christopher E. Olaes**	RKL1	6212	496–3275	7994

* Current as of October 31, 2007. 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.

‡ RKL1—Rockledge I Building.

§ RKL2—Rockledge II Building.

Office of the Director (continued)	**Bldg.**	**Room**	**Phone**	**MSC**
Planning, Architecture, Communication and Evaluation Branch				
Acting Chief, **Ralph Van Wey**	RKL1	6100	435–0116	7994
Ethics Office				
Director, **Nancy O'Hanlon, J.D.**	31	5A33	496–6471	2486
Ethics Coordinator, **Kim Y. Brinson**	31	5A33	496–6471	2486
Ethics Coordinator, **Hedy S. Tam**	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. Wheeles**	31	5A48	496–2411	2490
Administrative Officer, **Rebecca Ellett-Tener**	31	5A16	496–5931	2490
Office of Freedom of Information and Privacy				
Coordinator, **Suzanne A. Freeman**	RKL1	6070	496–9737	7957
Management Policy and Administrative Services Branch				
Chief, **Marilyn G. Jackson**	31	5A16	496–5931	2490
Financial Management Branch				
Chief, **Sandra L. 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 Management				
Acting Chief, **Timothy J. Wheeles**	31	5A48	496–2411	2490
Office of Research Training and Minority Health				
Director, **Helena O. Mishoe, Ph.D., M.P.H.**	RKL2	9093C	451–5081	7913
Deputy Director, **Chitra Krishnamurti, Ph.D.**	RKL2	9093C	451–5081	7913
Administrative Officer, **James McKenzie**	RKL2	8095	435–6373	7921
Office of Science and Technology				
Director, **Carl A. Roth, Ph.D., LL.M.**	31	5A07	496–6331	2482
Deputy Director, **Barbara Liu, M.S.**	31	5A07	496–9899	2482
Administrative Officer, **Rebecca Ellett-Tenner**	31	5A16	496–5931	2490
Program Studies and Reports Program				
Director, **Carl A. Roth, Ph.D., LL.M.**	31	5A07	496–6331	2482
Science and Special Issues Program				
Director, **Barbara Liu, M.S.**	31	5A07	496–9899	2482
Office of Public Liaison				
Acting Director, **Barbara Liu, M.S.**	31	5A07	496–9899	2482
Office of Technology Transfer and Development				
Director, **Lili M. Portilla**	RKL1	6018	402–5579	7992
Administrative Officer, **James McKenzie**	RKL2	8095	435–6373	7921
Division of Cardiovascular Diseases				
Office of the Director				
Acting Director, **Sonia I. Skarlatos, Ph.D.**	RKL2	8124	435–0466	7940
Acting Deputy Director, **Susan E. Old, Ph.D.**	RKL2	8132	435–0477	7940
Administrative Officer, **Lisa A. Freeny**	RKL2	8095	435–6373	7921
Special Assistant for Clinical Studies, **David Gordon, M.D., Ph.D.**	RKL2	8134	435–0466	7940

Division of Cardiovascular Diseases (continued)	**Bldg.**	**Room**	**Phone**	**MSC**
Research Training and Career Development Leader, **Jane Scott, Sc.D.**	RKL2	8138	435–0535	7940
Advanced Technologies and Surgery Branch				
Chief, **Denis B. Buxton, Ph.D.**	RKL2	8216	435–0504	7940
Deputy Chief, **Vacant**	RKL2	8214	435–0513	7940
Atherothrombosis and Coronary Artery Disease Branch				
Chief, **Michael J. Domanski, M.D.**	RKL2	8146	435–0550	7940
Deputy Chief, **Momtaz Wassaf, Ph.D.**	RKL2	8160	435–0550	7940
Heart Developmental and Structural Diseases Branch				
Chief, **Gail D. Pearson, M.D., Sc.D.**	RKL2	8140	435–0510	7940
Deputy Chief, **Charlene A. Schramm, Ph.D.**	RKL2	8100	435–0510	7940
Heart Failure and Arrhythmias Branch				
Chief, **Alice M. Mascette, M.D.**	RKL2	8170	435–0555	7940
Deputy Chief, **David A. Lathrop, Ph.D.**	RKL2	8174	435–0504	7940
Vascular Biology and Hypertension Branch				
Acting Chief, **Eser E. Tolunay, Ph.D.**	RKL2	8116	435–0560	7940
Deputy Chief, **Eser E. Tolunay, Ph.D.**	RKL2	8120	435–0560	7940
Division of Lung Diseases				
Office of the Director				
Director, **James P. Kiley, Ph.D.**	RKL2	10042	435–0233	7952
Deputy Director, **Vacant**	RKL2	10042	435–0233	7952
Administrative Officer, **Amy W. Sheetz**	RKL2	8095	435–6373	7921
Research Training and Career Development				
Leader, **Sandra Colombini-Hatch, M.D.**	RLK2	10042	435–0222	7952
Leader, **Ann E. Rothgeb**	RLK2	10042	435–0202	7952
Airway Biology and Disease Branch				
Chief, **Gail G. Weinmann, M.D.**	RKL2	10042	435–0202	7952
Lung Biology and Disease Branch				
Chief, **Dorothy B. Gail, Ph.D.**	RKL2	10042	435–0222	7952
National Center on Sleep Disorders Research				
Director, **Michael J. Twery, Ph.D.**	RKL2	10042	435–0199	7952
Division of Blood Diseases and Resources				
Office of the Director				
Director, **Charles Peterson, M.D., M.B.A.**	RKL2	9136	435–0080	7950
Acting Deputy Director, **George J. Nemo, Ph.D.**	RKL2	9144	435–0080	7950
Administrative Officer, **Amy W. Sheetz**	RKL2	8095	435–6373	7921
Research Training and Career Development				
Leader, **Traci H. Mondoro, Ph.D.**	RKL2	9174	435–0065	7950
Leader, **Rita Sarkar, Ph.D.**	RKL2	9161	435–0070	7950
Leader, **Ellen M. Werner, Ph.D.**	RKL2	9162	435–0050	7950
Leader, **Henry Chang, M.D.**	RKL2	9176	435–0080	7950
Blood Diseases Branch				
Chief, **Blaine Moore, Ph.D.**	RKL2	9164	435–0050	7950
Thrombosis and Hemostasis Branch				
Acting Chief, **Traci H. Mondoro, Ph.D.**	RKL2	9174	435–0065	7950
Transfusion Medicine and Cellular Therapeutics Branch				
Chief, **Simone A. Glynn, M.D.**	RKL2	9142	435–0078	7950

Division of Prevention and Population Sciences

Office of the Director				
Director, **Michael S. Lauer, M.D.**	RKL2	10122	435–0422	7936
Deputy Director, **Diane E. Bild, M.D., M.P.H.**	RKL2	10120	435–0422	7936
Senior Scientific Advisor, **Denise Simons-Morton, M.D., Ph.D.**	RKL2	10216	435–0384	7936
Administrative Officer, **Stacey A. Long**	RKL2	8095	435–6373	7921
Clinical Applications and Prevention Branch				
Acting Chief, **Lawrence J. Fine, M.D.**	RKL2	10100	435–0305	7936
Deputy Chief, **Lawrence J. Fine, M.D.**	RKL2	10100	435–0305	7936
Scientific Advisor, **Peter G. Kaufmann, Ph.D.**	RKL2	10106	435–2467	7936
Epidemiology Branch				
Chief, **Paul D. Sorlie, Ph.D.**	RKL2	10210	435–0707	7936
Deputy Chief, **Jean L. Olson, M.D., M.P.H.**	RKL2	10190	435–0707	7936
Deputy Chief, **Richard R. Fabsitz, Ph.D.**	RKL2	10204	435–0707	7936
Scientific Advisor, **Phyliss D. Sholinsky, M.S.P.H.**	RKL2	10206	435–0707	7936
Women's Health Initiative Branch				
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Chief, **Jacques E. Rossouw, Ph.D.**	RKL2	10214	402–2900	7936
Deputy Chief, **Shari E. Ludlam, M.P.H.**	RKL2	10218	402–2900	7936

Division for the Application of Research Discoveries

Director, **Gregory J. Morosco, Ph.D., M.P.H.**	31	4A10	496–5437	2480
Administrative Officer, **Rebecca Ellett-Tener**	31	5A16	496–5931	2490
Program Operations				
Senior Manager, **Nancy J. Poole, M.B.A.**	31	4A10	496–5437	2480
Enhanced Dissemination and Utilization Branch				
Chief, **Rob Fulwood, Ph.D., M.S.P.H.**	31	4A10	496–0554	2480
Health Communications and Social Marketing Branch				
Acting Chief, **Diane E. Striar**	31	4A10	496–0554	2480
Research Translation Branch				
Acting Chief, **Gregory J. Morosco, Ph.D., M.P.H.**	31	4A10	496–5437	2480

Division of Extramural Research Activities

Office of the Director				
Director, **Stephen C. Mockrin, Ph.D.**	RKL2	7100	435–0260	7922
Deputy Director, **Vacant**	RKL2	7104	435–0260	7922
Chief of Staff, **Janet George**	RKL2	7220	435–0260	7922
Administrative Officer, **Veronica M. VanWagner**	RKL2	8095	435–6373	7921
Office of Acquisitions				
Director, **John C. Taylor**	RKL2	6100	435–0330	7902
Deputy Director, **Christopher J. Belt**	RKL2	6106	435–0330	7902
Blood Diseases and Resources Contracts Branch				
Chief, **Joanna Bursenos Magginas**	RKL2	6136	435–0355	7902
Cardiovascular and Lung Diseases Contracts Branch				
Chief, **Pamela S. Lew**	RKL2	6016	435–0340	7902
Prevention and Population Sciences Contracts Branch				
Chief, **Paul D. McFarland**	RKL2	6126	435–0345	7902
Procurement Branch				
Chief, **Debra C. Hawkins**	RKL2	6150	435–0366	7902

Division of Extramural Research Activities (continued)	**Bldg.**	**Room**	**Phone**	**MSC**
Office of Committee Management				
Director, **Kathryn M. Valeda**	RKL2	7110	435–0255	7922
Deputy Director, **David Alperin**	RLK2	7110	435–0255	7922
Office of Extramural Policy and Review				
Director, **Paul A. Velletri, Ph.D.**	RKL2	7218	435–0260	7922
Review Branch				
Chief, **Valerie L. Prenger, Ph.D.**	RKL2	7214	435–0270	7924
Office of Grants Management				
Director, **Suzanne A. White**	RKL2	7160	435–0144	7926
Deputy Director, **Raymond Zimmerman**	RKL2	7130	435–0144	7926
Blood Diseases and Resources Grants Management Branch				
Chief, **Robert Vinson, Jr.**	RKL2	7156	435–0166	7926
Cardiovascular Diseases Grants Management Branch				
Chief, **David Reiter**	RKL2	7172	435–0177	7926
Lung Diseases Grants Management Branch				
Chief, **Ryan C. Lombardi**	RKL2	7154	435–0166	7926
Prevention and Population Sciences Grants Management Branch				
Chief, **Teresa F. Marquette**	RKL2	7128	435–0177	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	8132	435–0477	7940
Division of Intramural Research				
Office of the Director				
Director, **Robert S. Balaban, Ph.D.**	10CRC*	4-1581	496–2116	1458
Deputy Director, **Warren Leonard, M.D.**	10	7N252	496–0098	1674
Intramural Administrative Management Branch				
Chief, **Gary Unger**	10	7N214	451–0892	1686
Office of the Scientific Director				
Director, **Robert S. Balaban, Ph.D.**	10CRC	4-1581	496–2116	1458
Office of Education				
Chief, **Herbert Geller, Ph.D.**	10	2N242	451–9440	1754
Imaging Probe Development Center				
Director, **Gary L. Griffins, Ph.D.**	9800	3042	217–5770	3372
Office of the Clinical Director				
Director, **Richard O. Cannon III, M.D.**	10CRC	5-3330	496–9895	1454
Hematology Branch				
Chief, **Neal Young, M.D.**	10CRC	3-5140	496–5093	1202
FACs Core				
Head, **Philip McCoy, Ph.D.**	10	8C104	451–8824	1357
Pulmonary and Vascular Medicine Branch				
Chief, **Mark Gladwin, M.D.**	10CRC	5-5142	435–2310	1476
Genomics Core				
Head, **Nalini Raghavachari, Ph.D.**	10	8C103B	435–2304	1754
Translational Medicine Branch				
Chief, **Toren Finkel, M.D., Ph.D.**	10CRC	5-3330	402–4081	1454
Deputy Chief, **Joel Moss, M.D., Ph.D.**	10	6D03	496–1597	1590

* 10CRC—Building 10 Clinical Research Center

Division of Intramural Research (continued)	**Bldg.**	**Room**	**Phone**	**MSC**
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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
Animal MRI/Imaging Core				
Head, **Stasia Anderson, Ph.D.**	10	2N240	401–0908	1518
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
Electron Microscopy Core				
Head, **Mathew Daniels, Ph.D.**	50	3318	496–2898	8017
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
Immunology Center				
Director, **Warren Leonard, M.D.**	10	7N252	496–0098	1674

NIH Mailing Address Formats

NHLBI staff e-mail addresses can be found by using the NIH Directory and E-mail Forwarding Service located on the Internet at http://directory.nih.gov.

Please use the following formats for NIH mailing addresses:

Building 10
Full Name
NHLBI, NIH
Building 10, Room ____
10 Center Drive MSC* ____
Bethesda, MD 20892–MSC**

Building 31
Full Name
NHLBI, NIH
Building 31, Room ____
31 Center Drive MSC* ____
Bethesda, MD 20892–MSC**

Building 50
Full Name
NHLBI, NIH
Building 50, Room ____
50 South Drive MSC*
Bethesda, MD 20892–MSC**

Rockledge II Building
Full Name
NHLBI, NIH
Two Rockledge Center, Room ____
6701 Rockledge Drive MSC* ____
Bethesda, MD 20817–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.

In 2007, the NHLBI released the *Strategic Plan: A Scientific Blueprint for the Next Decade,* which is intended to guide the Institute in its research and training programs over the next 5 to 10 years. Its goals reflect the successive movement of scientific discovery from "form to function," "function to causes," and "causes to cures." They focus on questions and processes that are broadly applicable to the

Institute's mandate, rather than on any specific disease or condition. The goals are:

- To increase understanding of the molecular and physiological basis of health and disease and use that understanding to improve diagnosis, treatment, and prevention.
- To improve understanding of the clinical mechanisms of disease and thereby enable better prevention, diagnosis, and treatment.
- To translate research into practice for the benefit of personal and public health.

During the past year, the Institute continued to restructure its organization to improve the Institute's ability to serve as an international leader through support of innovative research in heart, lung, blood, and sleep research. The reorganization strengthened scientific coordination by seeking specialized depth in specific disease areas, integrating basic research and clinical trials components, emphasizing prevention, and fostering population sciences.

Education outreach was a major area to undergo reorganization. Through the Office of Prevention, Education, and Control (OPEC), the NHLBI has had a long history of establishing and maintaining educational outreach programs to fulfill its Congressional mandate to translate and disseminate science-based information to professional, patient, and public audiences. In an effort to enhance the visibility and effectiveness of this mandated function, the NHLBI Director established the Division for the Application of Research Discoveries (DARD), replacing the OPEC. The DARD provides leadership for the vigorous pursuit of excellence in national and international research translation, dissemination, and utilization programs to speed the application of scientific advances in prevention, detection, and treatment of cardiovascular, lung, and blood diseases and to reduce the discovery–delivery gap. Through knowledge networks, education programs, community outreach, conferences, and symposia, the DARD fosters communication and collaboration among researchers, clinical and public health practitioners, patients, and the general public.

NHLBI Programs

The programs of the NHLBI, as shown on page 9, are implemented through five extramural units:

- Division of Cardiovascular Diseases (DCVD)
- Division of Lung Diseases (DLD)
- Division of Blood Diseases and Resources (DBDR)
- Division of Prevention and Population Sciences (DPPS)
- Division for the Application of Research Discoveries

and one intramural unit:

- 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 (SCOR) and Specialized Centers of Clinically Oriented Research (SCCOR) grants, comprehensive center grants, contracts, and research training and career development programs.

Descriptions of the Divisions 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 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

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 Development 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)/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 Disorders and Related Conditions

Blood Diseases and Resources

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

Thrombosis and Hemostasis
Hematologic Immune Disorders
Hemophilia and Other Bleeding Disorders
Hemostasis
Immunity and Inflammation
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
Hormone Therapy Trial
Dietary Modification Trial
Calcium and Vitamin D Trial
Observational Study

Application of Research Discoveries

Research Translation Branch
Research Translation
Research Opportunities Identification
Clinical Guidelines
Clinical Support and Implementation Applications
Knowledge Exchange Networks

Enhanced Dissemination and Utilization Branch
Research Dissemination
Research Utilization
Data Analysis and Evaluation

Health Communications and Social Marketing Branch
Health Communication Strategies
Social Marketing
Media Relations
NHLBI Health Information Center

Intramural Research

Clinical Research
Cardiothoracic Surgery
Hematology
Pulmonary and Vascular Medicine
Translational Medicine

Laboratory Research
Biochemistry and Biophysics
Cell Biology and Physiology
Genetics and Development Biology
Immunology

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. SCCORs support clinical collaborative research in cardiac dysfunction and disease; pediatric heart development and disease; and vascular injury, repair, and remodeling.

The Division is organized into the five branches and one 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 of CVD. It promotes opportunities to translate promising scientific and technological advances from discovery through preclinical studies to clinical trials. The Branch supports the following areas:

- Diagnostics: proteomic, genomic, and other biomarker technologies and imaging modalities/agents to identify CVD and guide therapy.
- Therapeutics: tissue-, cell-, and gene-based therapies; regenerative and reparative medicine; image-guided therapies; 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 promotes opportunities to translate promising scientific and technological advances from discovery through preclinical studies to networks and multisite clinical trials. The Branch supports the following areas:

- 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 Diseases Branch

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

- 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. The Branch supports the following areas:

- 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. The Branch supports the following areas:

- 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: aneurysms and cerebrovascular, renal, and peripheral vascular disease.
- 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—who are 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 the current and future needs of the cardiovascular research workforce. The Office supports the following programs:

- 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, progression, diagnosis, treatment, and prevention of lung diseases and sleep disorders. It supports basic research, clinical trials, national pulmonary centers, technological development, and application of research findings. The Division focuses on 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 and neurobiology of sleep and sleep apnea. SCCORs support collaborative studies on translational research in acute lung injury, COPD, pulmonary vascular disease, and host factors in chronic lung diseases.

The Division also supports (a) demonstration and dissemination projects to transfer basic research and clinical findings to health care professionals and patients and (b) training and career development programs for individuals interested in furthering their professional abilities in lung diseases research. The DLD, through the National Center on Sleep Disorders Research, coordinates sleep research activities across NIH, other Federal Agencies, and outside organizations.

The Division is organized into the three major branches described below.

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 genetics, etiology, and pathophysiology of the diseases. Clinical studies focus on improving asthma management; 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 Branch 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 National Center on Sleep Disorders Research (NCSDR) plans, directs, and supports basic, clinical, and applied research, health education, and training in sleep 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 several Federal Government Agencies and with professional, voluntary, and private organizations. The Center promotes information sharing and coordinates implementation of inter-Agency 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, treatment, 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. The Division has 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 diseases, transfusion biology and medicine, SCD, and cell-based therapy for blood diseases. Clinical networks support collaborative clinical research in rare diseases, bone marrow transplantation, and transfusion medicine/hemostasis. The DBDR also has a major responsibility to improve the adequacy and safety of the Nation's blood supply.

The Division is organized into the three major branches described below.

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. The Centers conduct basic and collaborative clinical research and provide state-of-the-art patient care, educational activities for patients and health professionals, community outreach, and genetic counseling services.

Clinical networks in thalassemia and SCD are 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 that focuses on understanding the pathogenesis of arterial and venous thrombosis 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 the three major branches described below.

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 factors 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.

Women's Health Initiative Branch

The Women's Health Initiative 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 of 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 by using data from questionnaires, clinical examinations, and laboratory analyses. The long-term 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 developments related to them.

The 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 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 of 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 human.

Translational Medicine Branch

The Translational Medicine Branch conducts biomedical research directed at defining at the molecular level, normal and abnormal biologic function. It develops diagnostic and therapeutic modalities for the treatment and understanding of CVD and implements mechanism-based clinical studies centered on innovative discoveries and observations from inside and outside of the Branch.

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 and Vascular Medicine Branch

The Pulmonary and Vascular Medicine Branch conducts research on the lung, heart, and systemic vasculature directed at defining—at the molecular, biochemical, and functional levels—normal physiological function and novel mechanisms of disease. It conducts research in emerging diseases of the lung characterized by unknown etiology and molecular pathogenesis. Areas of interest include lung diseases in blacks such as sickle cell lung disease and sarcoidosis; the role of nitric oxide, nitrite, gender, preconditioning and mitochondrial function on the modulation of ischemia and reperfusion injury of the heart and lung; and translational study and drug development for therapeutic modulation of vascular, pulmonary, and cardiac cellular and molecular dysfunction in diseases of the lung and heart.

Division for the Application of Research Discoveries

The DARD 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. Special attention is given to eliminate health disparities among high-risk, low-income, and minority populations.

The Division is organized into the three branches described below.

Research Translation Branch

The Research Translation Branch fosters the rapid translation of emergent knowledge into practice by synthesizing and organizing evidence around priority diseases and conditions and identifies knowledge gaps that need to be addressed by future research. It promotes the use of evidence-based reviews and develops or facilitates the development of clinical guidelines with relevant stakeholders. Additionally, it develops support for clinical decisions and other innovative implementation applications for use in clinical and public health practice settings. Through the use of knowledge networks and other strategies, it enables researchers and users of research to discuss issues of research applicability, relevance, and utility that may offer guidance to future research needs and opportunities.

Enhanced Dissemination and Utilization Branch

The Enhanced Dissemination and Utilization Branch collects, synthesizes, and communicates new knowledge and recommendations for dissemination and utilization of research-based findings to diverse target audiences, including minority and underserved groups. It provides technical assistance and information resources to enhance NHLBI grantees' dissemination plans and practices and accelerates the speed with which evidence-based tools and education programs move into community practice settings. Additionally, it establishes community-based Enhanced Dissemination and Utilization Centers committed to applying and evaluating the impact of the latest research advanced in multiple settings to achieve the U.S. Department of Health and Human Services (HHS) Healthy People goals and to eliminate health disparities. The Branch evaluates the effectiveness of its dissemination and utilization activities so that it can apply lessons learned to future programs.

Health Communications and Social Marketing Branch

The Health Communications and Social Marketing Branch supports communication of health information to health care professionals, patients, and the public. Using results of the latest communications and social marketing research, the Branch plans health communications strategies and develops consumer messages and public education campaigns. It develops and maintains media relations and communicates research and educational messages through multiple media channels. In addition, the Branch operates the NHLBI Health Information Center to respond to professional and public inquiries and to develop and market publications and online information to health care providers and the public. The Center also manages NHLBI exhibit programs.

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 National High Blood Pressure Education Program (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, Division of Heart and Vascular Diseases (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 coronary heart disease (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 Division of Epidemiology and Clinical Applications (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 inter-Agency 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 National Cholesterol Education Program (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 Obesity Education Initiative (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 National Heart Attack Alert Program (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 following risk factors affect the progression of atherosclerosis equally in women and men, regardless of race: low high-density lipoprotein (HDL) cholesterol, high low-density lipoprotein (LDL) cholesterol, and cigarette smoking.

February 24, 1997. The National Asthma Education and Prevention Program (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 National Institute of Diabetes and Digestive and Kidney Diseases (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 Canadian Institutes of Health Research (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 (HCV) 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." (peripheral artery disease).

January 18, 2007. The NHLBI launches the Learn More Breathe Better campaign to increase COPD awareness among primary care physicians and the public.

August 29, 2007. The NAEPP issues the *Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma—Full Report 2007,* an update of the latest scientific evidence and recommendations for clinical practice on asthma care.

October 8, 2007. Mario Capecchi and Oliver Smithies, who are researchers supported by the NHLBI, are awarded the Nobel Prize in Physiology or Medicine for their creation of a gene-targeting technique that allows scientists to create transgenic mice that are genetically modified to develop human diseases.

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 1,093,000 deaths and 46 percent of all deaths in the United States (p. 31). The projected economic cost in 2008 for these diseases is expected to be $623 billion, 23 percent of the total economic costs of illness, injuries, and death (p. 47). Of all diseases, heart disease is the leading cause of death, cerebrovascular disease is third (behind cancer), and COPD (including asthma) ranks fourth (p. 34). Cardiovascular and lung diseases account for 3 of the 4 leading causes of death (p. 34) and 4 of the 10 leading causes of infant death (p. 40). Hypertension, heart disease, asthma, and COPD are especially prevalent and account for substantial morbidity in Americans (p. 43).

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.

Mortality statistics in this chapter are for diseases or conditions classified as the underlying cause of death. Heart failure, however, is never truly an underlying cause even though 57,120 deaths in 2004 were nominally coded to it as the underlying cause. Therefore, in this chapter, mortality statistics attributed to heart failure represent it as either the underlying cause or a contributing cause of death.

The 2004 mortality statistics in this Fact Book are final counts. They differ from the 2004 mortality statistics presented in the FY 2006 Fact Book because those statistics were preliminary (though not stated).

Cardiovascular Diseases

- In 2004, CVD caused 870,000 deaths—36 percent of all deaths (p. 31).
- Heart disease is the leading cause of death; the main form, CHD, caused 452,000 deaths in 2004 (pp. 32, 34).
- The annual number of deaths from CVD increased substantially between 1900 and 1970 and remains high (p. 33).
- The death rate (not age-adjusted) for CVD increased from 1920 until it peaked in 1968. Since then, the trend has been downward. In 2005, the rate was similar to the rate in the 1920s (p. 33).
- Cerebrovascular disease, the third leading cause of death, accounted for 150,000 deaths in 2004 (pp. 32, 34).
- Heart disease is second only to all cancers combined in years of potential life lost (p. 34).
- 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. 34).
- Between 1970 and 2004, the increase in deaths with heart failure as the underlying or contributing cause is a major exception to the mortality decline in CVD (p. 35).
- Between 1985 and 2004, 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 steepest in whites (p. 36).

- Because of the rapid decline in mortality from CHD since the peak in 1968, there were 1,036,000 fewer deaths from CHD in 2005 than would have occurred if there had been no decline (p. 37).
- 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. 37).
- The decline in CHD mortality began earlier in the United States than in most countries and outpaced that in most countries until the 1990s (only selected countries are shown) (p. 38).
- Between 1999 and 2005, the percent decline in death rates for CHD and stroke was slightly greater for whites than for blacks (p. 39).
- In 2005, an estimated 80.7 million persons in the United States had some form of CVD, 73 million had hypertension, and 16 million had CHD (p. 43).
- 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 1999–2004 (p. 44).
- 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. 45).
- 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. 40).
- Hospitalization rates for heart failure increased between 1971 and 2005 (p. 46).
- The estimated economic cost of CVD for 2008 is approximately $448 billion:
  - $296 billion in direct health expenditures
  - $38 billion in indirect cost of morbidity
  - $114 billion in indirect cost of mortality (p. 47).

Lung Diseases

- Lung diseases, excluding lung cancer, caused an estimated 227,000 deaths in 2004 (p. 31).
- COPD caused 118,000 deaths in 2004 and is the fourth leading cause of death (pp. 32, 34).
- Between 1999 and 2005, 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. 39).
- Between 1980 and 2005, infant death rates for various lung diseases declined markedly (p. 39).
- Of the 10 leading causes of infant mortality, 4 are lung diseases or have a lung disease component (p. 40). Between 1995 and 2005, changes in mortality for the causes were:
  - Congenital anomalies (-14 percent)
  - Disorders of short gestation (2 percent)
  - Sudden infant death syndrome (-45 percent)
  - Respiratory distress syndrome (-40 percent).
- One in five deaths in children under 1 year of age is due to a lung disease (p. 40).
- Between 1980 and 2000, the COPD death rate for women in the United States is increasing significantly compared with the rates in several other countries (p. 41).
- Between 1985 and 2004, death rates for COPD increased for women in all racial/ethnic groups except Asian. For men, the rates decreased in all racial/ethnic groups except American Indians (p. 42).
- 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 million in 1990 to 7 million in 2005 (p. 42).
- Asthma is a common chronic condition, particularly in children (pp. 43, 44, 46).
- The economic cost of lung diseases is expected to be $160 billion in 2008—$99 billion in direct health expenditures and $60 billion in indirect cost of morbidity and mortality (p. 47).

Blood Diseases

- An estimated 223,000 deaths, 9 percent of all deaths, were attributed to blood diseases in 2004 (p. 31). These include the following:
  - 214,000 due to blood-clotting disorders
  - 9,000 to diseases of the red blood cell and bleeding disorders (p. 32).
- A large proportion of deaths from AMI and cerebrovascular disease involve blood-clotting problems (p. 32).
- In 2008, blood-clotting disorders are expected to cost the Nation's economy $105 billion, and other blood diseases will cost $14 billion (p. 47).

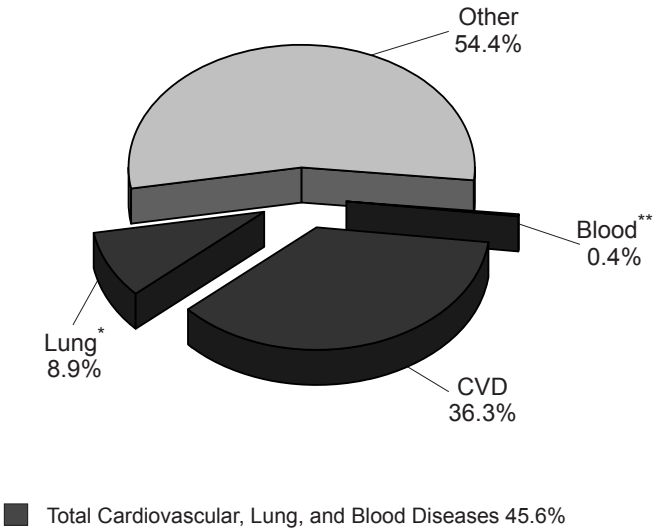
Deaths From All Causes and Deaths From Cardiovascular, Lung, and Blood Diseases, U.S., 1984 and 2004

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	1,093,000	46
Cardiovascular Diseases	984,000	48	870,000	36
Blood	319,000*	16	223,000**	9
Lung	169,000†	8	227,000‡	9
All Other Causes	890,000	44	1,305,000	54

* Includes 311,000 CVD deaths involving blood-clotting diseases.
** Includes 214,000 CVD deaths involving blood-clotting diseases.
† Includes 12,000 CVD deaths due to pulmonary heart disease.
‡ Includes 13,000 CVD deaths due to pulmonary heart disease.

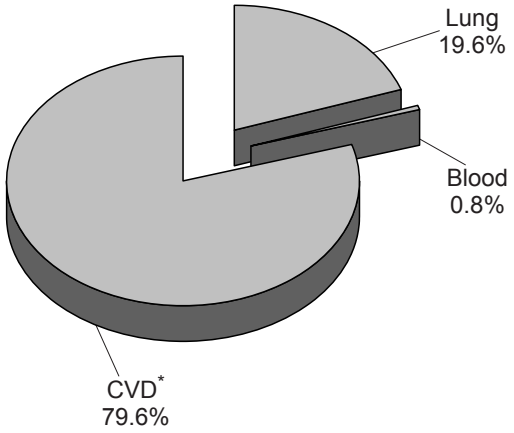
Source: Vital Statistics of the United States, National Center for Health Statistics (NCHS).

Deaths by Major Causes, U.S., 2004



* Excludes 13,000 deaths from pulmonary heart disease (0.5%).
** Excludes 214,000 deaths from blood-clotting disorders (8.9%).

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



* CVD involving blood clotting (24.6%)

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

	Deaths (Thousands)		
Cause of Death	**Cardiovascular**	**Lung**	**Blood**
Acute Myocardial Infarction	157	—	107*
Other Coronary Heart Disease	295	—	—
Cerebrovascular Diseases (Stroke)	150	—	95*
Other Atherosclerosis	36	—	4*
Pulmonary Embolism	8	8*	8*
Other Cardiovascular Diseases	224	5*	—
Bleeding and Red Blood Cell Diseases	—	—	9
Chronic Obstructive Pulmonary Disease**	—	118	—
Asthma	—	4	—
Other Airway Diseases	—	0	—
Pneumonia	—	60	—
Neonatal Pulmonary Disorders	—	5	—
Interstitial Lung Diseases	—	5	—
Lung Diseases Due to External Agents	—	18	—
Other Lung Diseases	—	4	—
Total	**870**	**227**	**223**

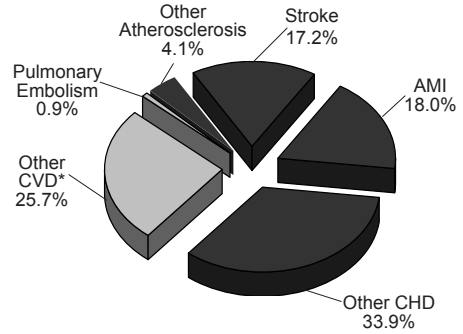
* Deaths from clotting or pulmonary disorders also are included as cardiovascular deaths.

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

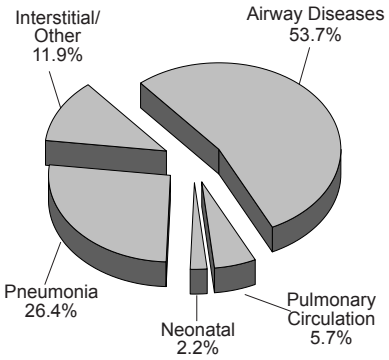
Note: Total, excluding overlap, is 1,093,000.

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

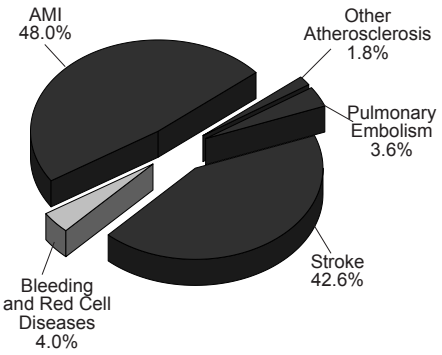
Deaths From Cardiovascular Diseases, U.S., 2004



Deaths From Lung Diseases, U.S., 2004



Deaths From Blood Diseases, U.S., 2004



Atherosclerosis-related disease 73.4%

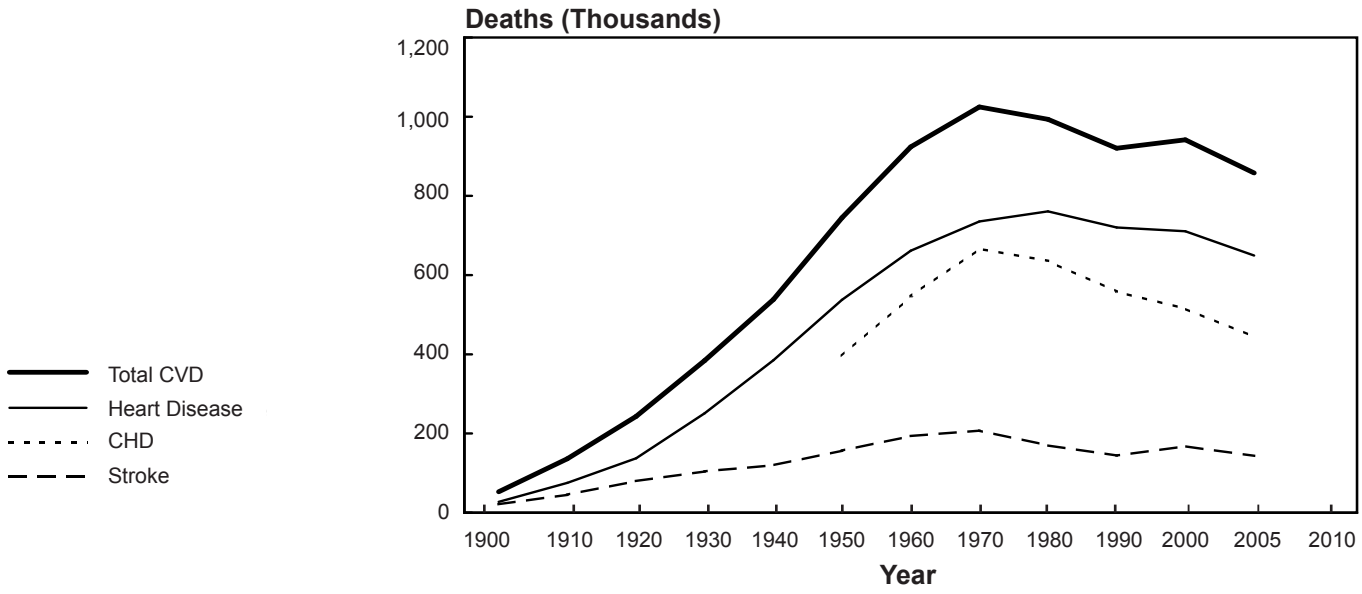
Blood clotting disorders 96.0%

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

Note: Numbers may not sum to 100 percent due to rounding.

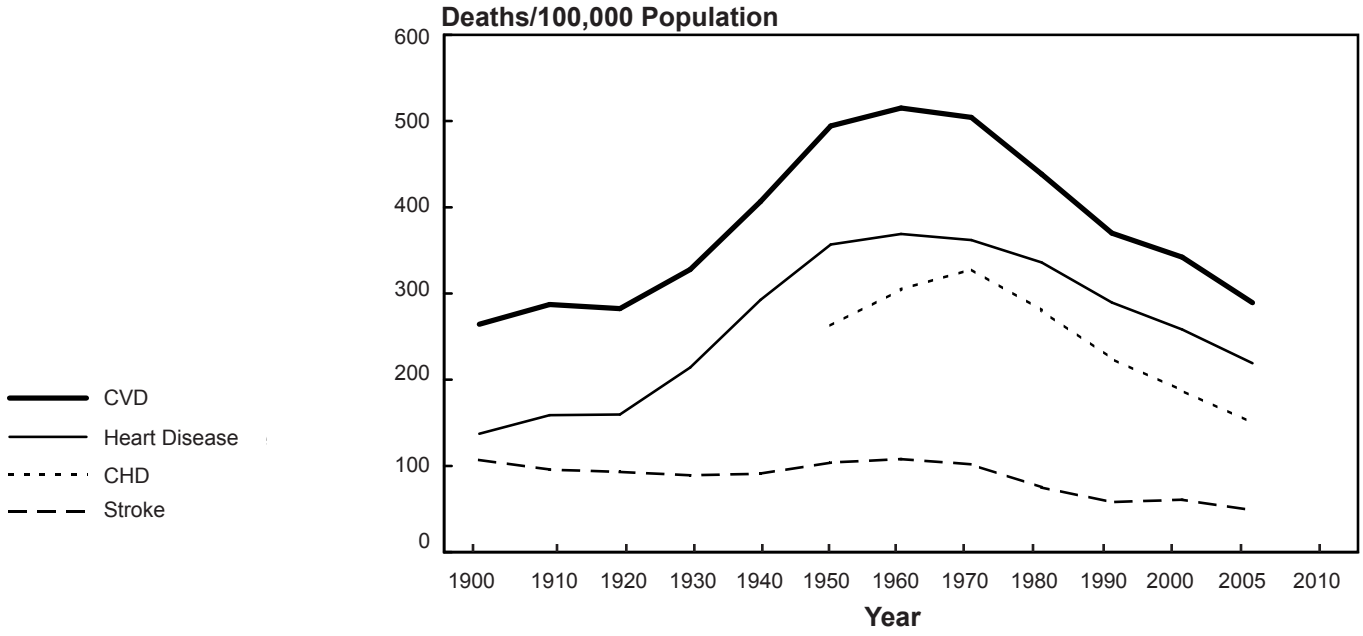
Source: Estimated by the NHLBI from Vital Statistics of the United States, NCHS.

Deaths From Cardiovascular Diseases, U.S., 1900–2005*



* Data for 2005 are preliminary.
Source: Vital Statistics of the United States, NCHS.

Death Rates* for Cardiovascular Diseases, U.S., 1900–2005**

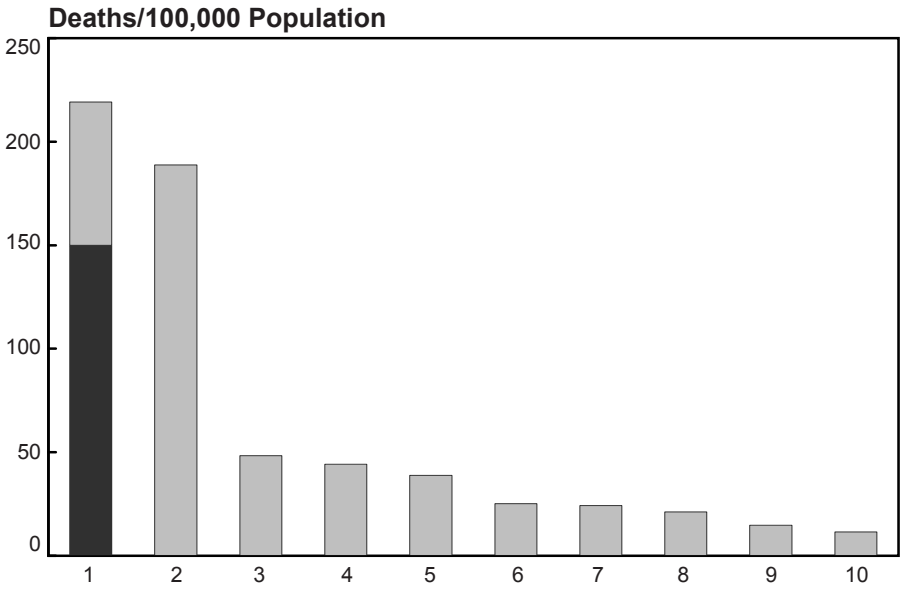


* Not age-adjusted.
** Data for 2005 are preliminary.
Source: Vital Statistics of the United States, NCHS.

Ten Leading Causes of Death: Death Rates, U.S., 2005*

Cause of Death

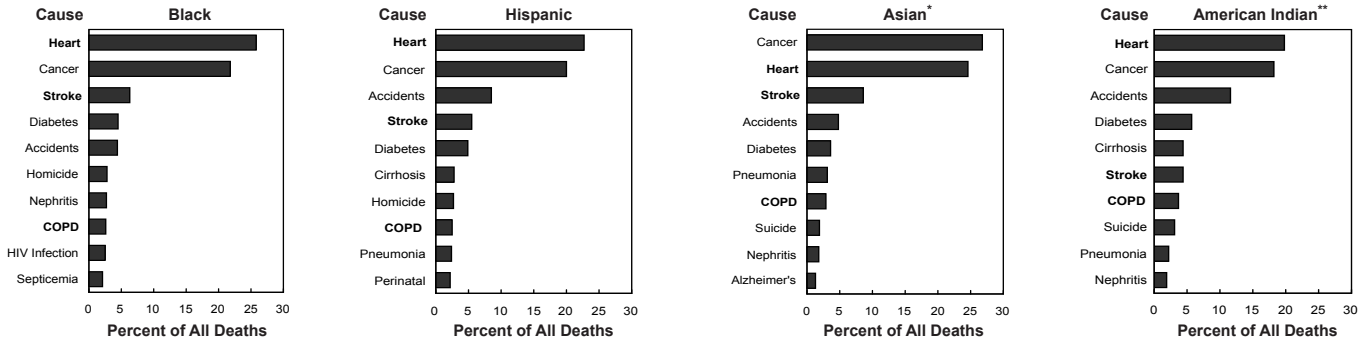
1 = **Heart Disease****
2 = Cancer
3 = **Stroke**
4 = **COPD**†
5 = Accidents
6 = Diabetes
7 = Alzheimer's Disease
8 = Influenza and Pneumonia
9 = Nephritis
10 = Septicemia



	1	2	3	4	5	6	7	8	9	10
Years of potential life lost (millions)‡	3.5	4.9	0.6	0.6	3.2	0.6	<0.1	0.3	0.2	0.3

* Data for 2005 are preliminary.
** Includes 149.8 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: Diseases shown in bold are those addressed in Institute programs.
Source: Vital Statistics of the United States, NCHS.

Ten Leading Causes of Death Among Minority Groups, U.S., 2004



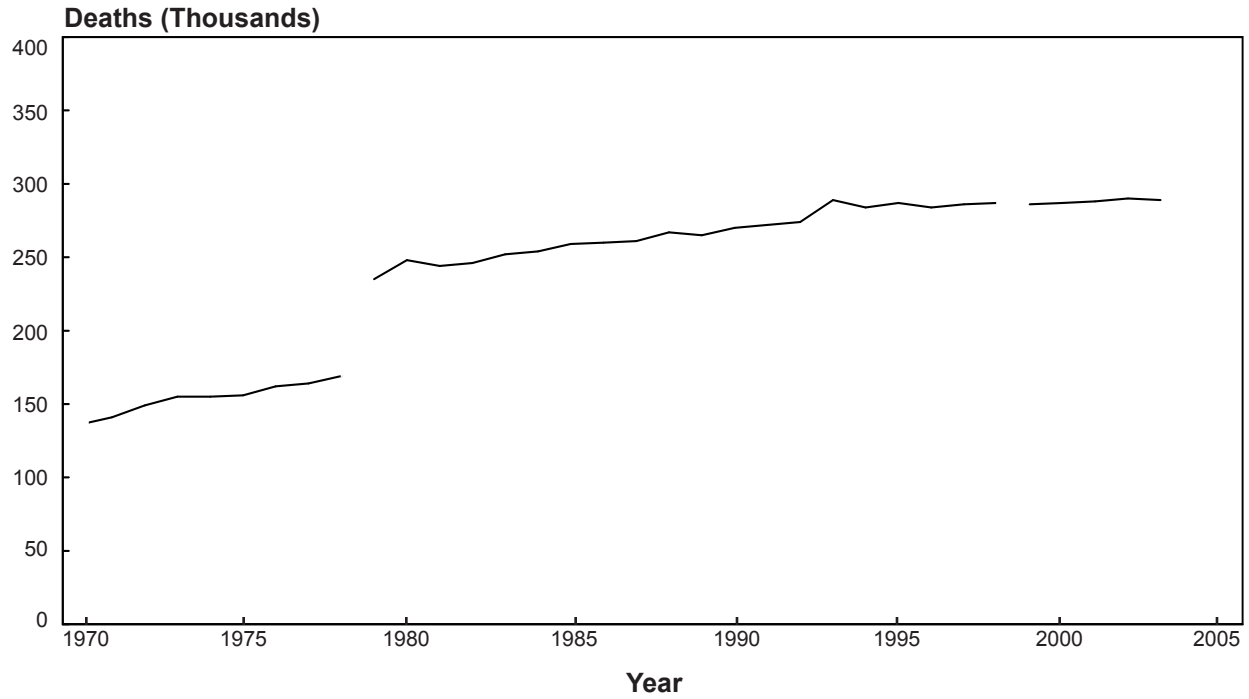
* Includes deaths among individuals of Asian extraction and Asian-Pacific Islanders.
** Includes deaths among Aleuts and Eskimos.
Note: Causes of death shown in bold are those addressed in Institute programs.
Source: Vital Statistics of the United States, NCHS.

Age-Adjusted Death Rates for Cardiovascular and Noncardiovascular Diseases, U.S., 1963, 1985, and 2005*

Cause of Death	Deaths/100,000 Population 1963	1985	2005	Percent Change 1963–2005	Percent Change 1985–2005
All Causes	1,346	988	799	-41	-19
Cardiovascular Diseases	805	481	278	-65	-42
Coronary Heart Disease	478	260	144	-70	-45
Stroke	174	80**	47	-73	-42
Other	153	140	87	-43	-37
Noncardiovascular Diseases	541	507	521	-4	3
COPD and Asthma	16	36†	43	162	20
Other	524	471	478	-9	1

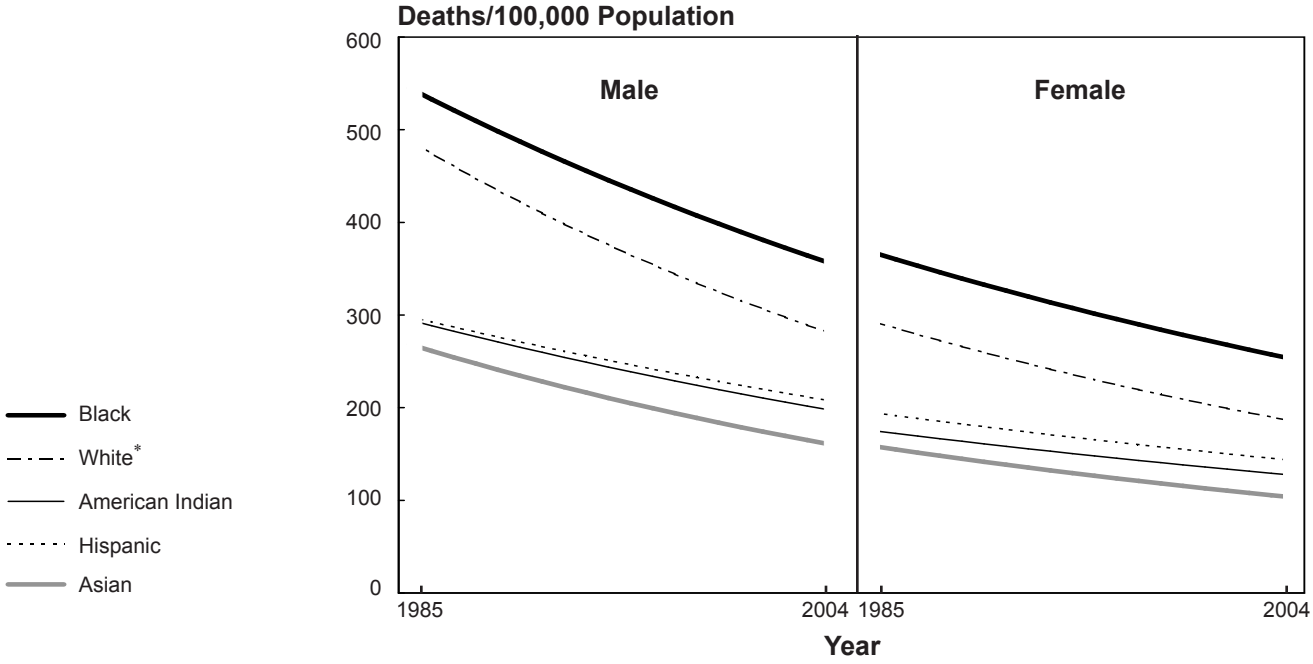
* Data for 2005 are preliminary..
** Comparability ratio (1.0502) applied.
† Comparability ratio (1.0411) applied.
Source: Vital Statistics of the United States, NCHS.

Deaths Attributed to Heart Failure,* U.S., 1970–2004



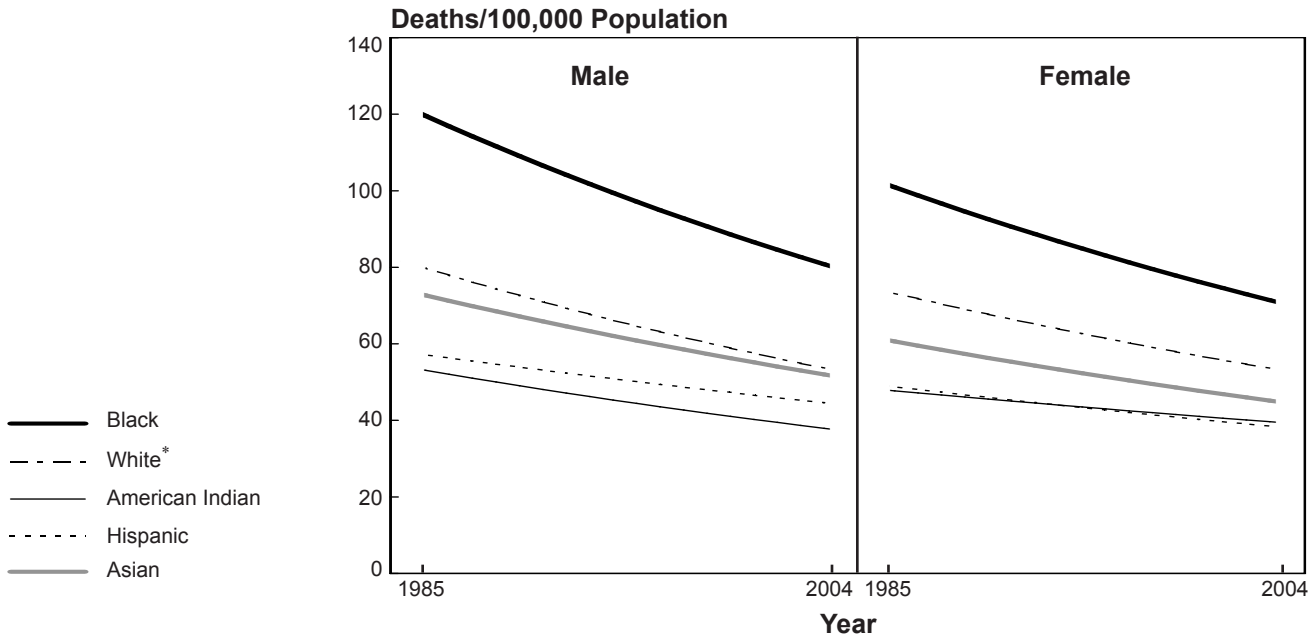
* Heart failure as the underlying or contributing cause of death.
Note: Breaks in trend line indicate change in ICD codes.
Source: Vital Statistics of the United States, NCHS.

Age-Adjusted Death Rates for Heart Disease by Race/Ethnicity and Sex, U.S., 1985–2004



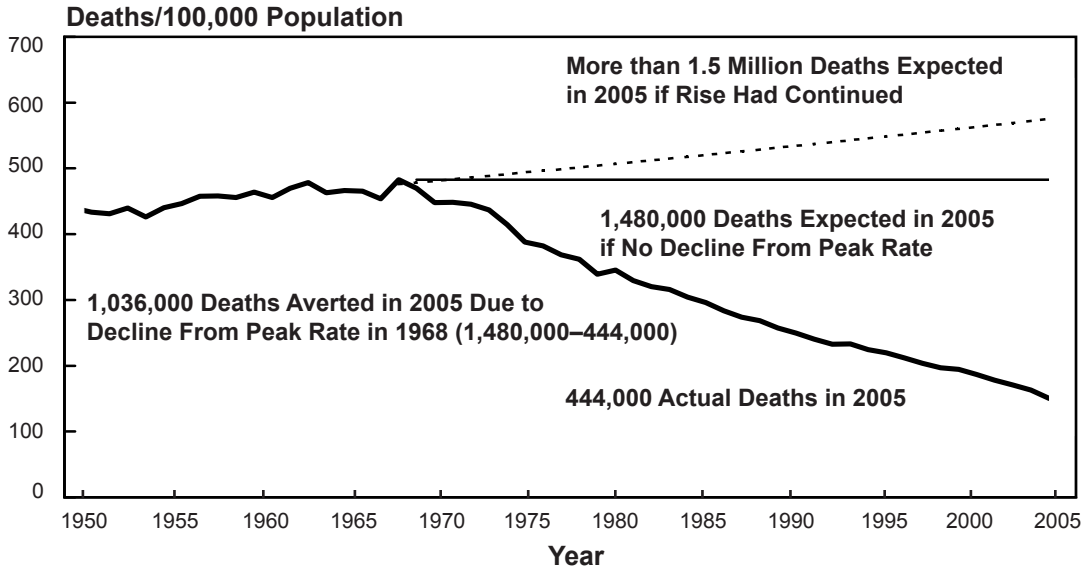
* Non-Hispanic.
Note: Each line is a log linear regression derived from the actual rates.
Source: Vital Statistics of the United States, NCHS.

Age-Adjusted Death Rates for Stroke by Race/Ethnicity and Sex, U.S., 1985–2004



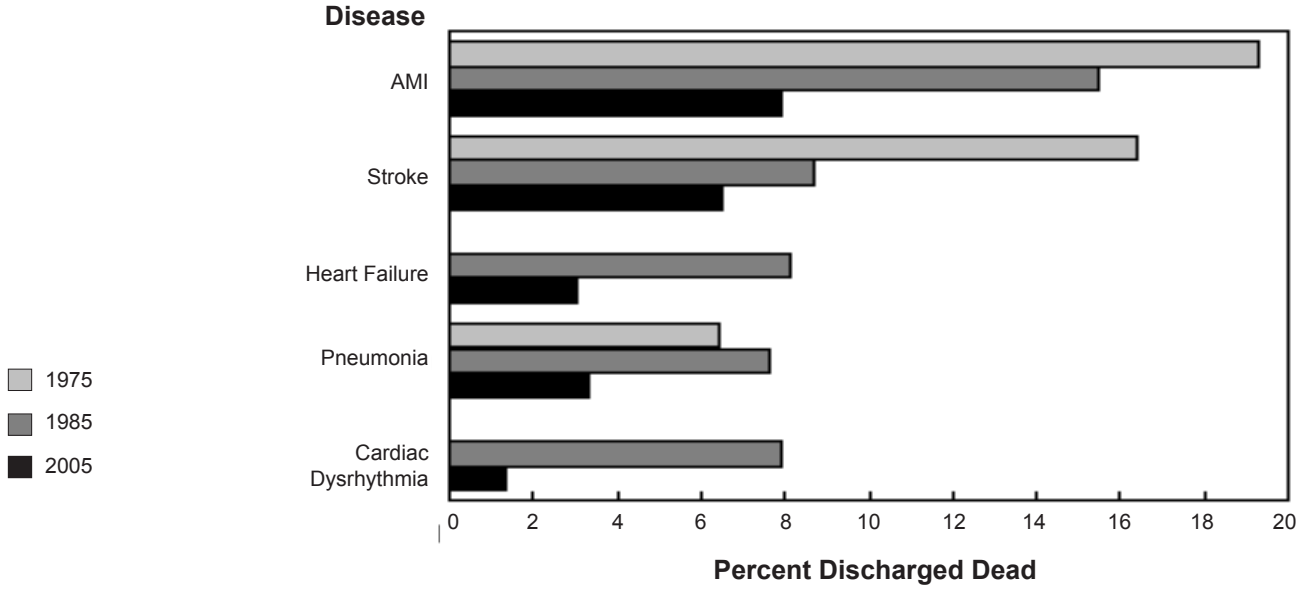
* Non-Hispanic.
Note: Each line is a log linear regression derived from the actual rates.
Source: Vital Statistics of the United States, NCHS.

Age-Adjusted Death Rates for Coronary Heart Disease, U.S., 1950–2005*
Actual Rate and Expected Rates if Rise Had Continued or Reached a Plateau



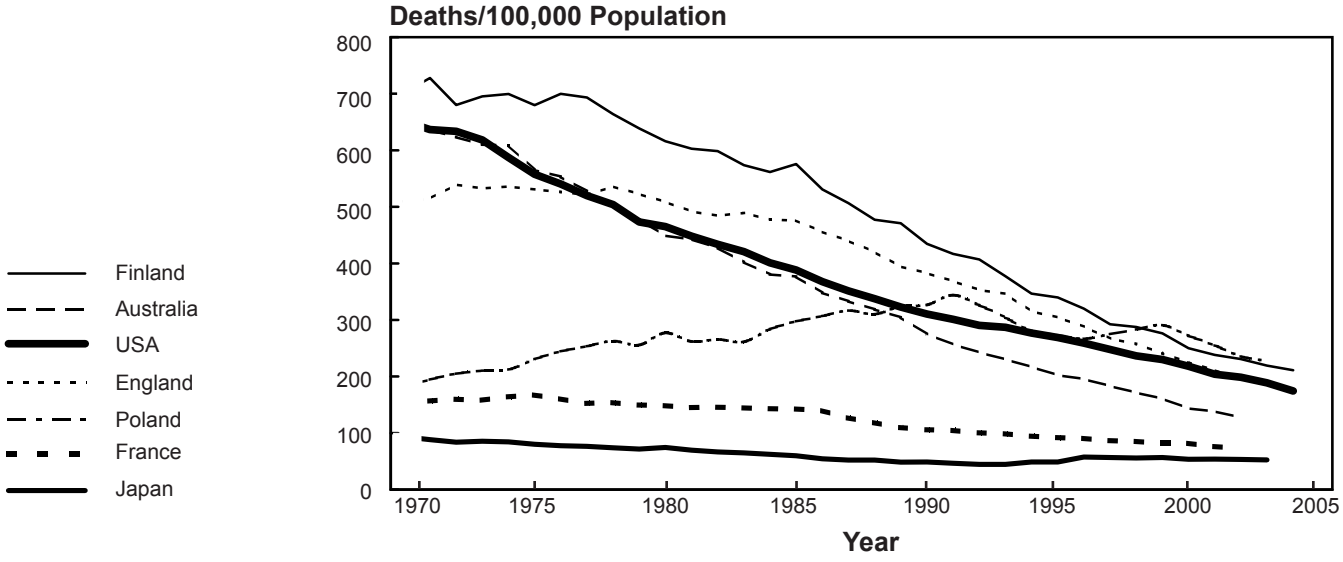
* Data for 2005 are preliminary.
Source: Vital Statistics of the United States, NCHS.

Common Cardiovascular and Lung Diseases With High Percentage Discharged Dead From Hospitals, U.S., 1975, 1985, and 2005



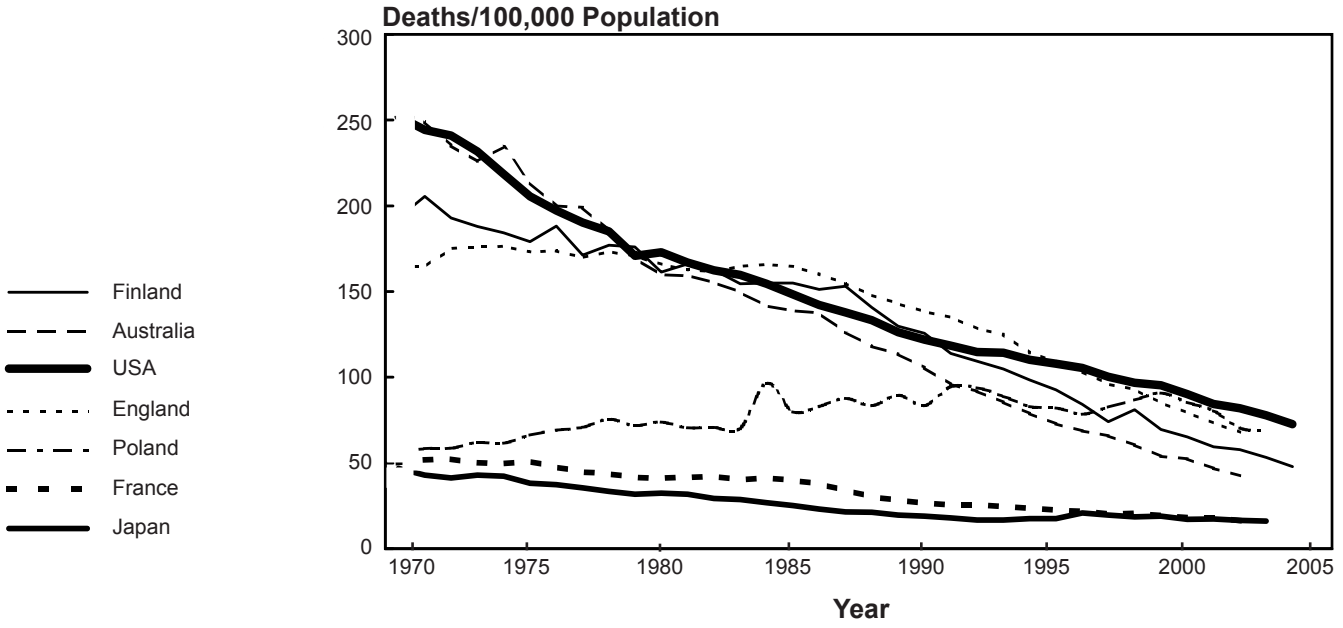
Source: National Hospital Discharge Survey, NCHS.

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



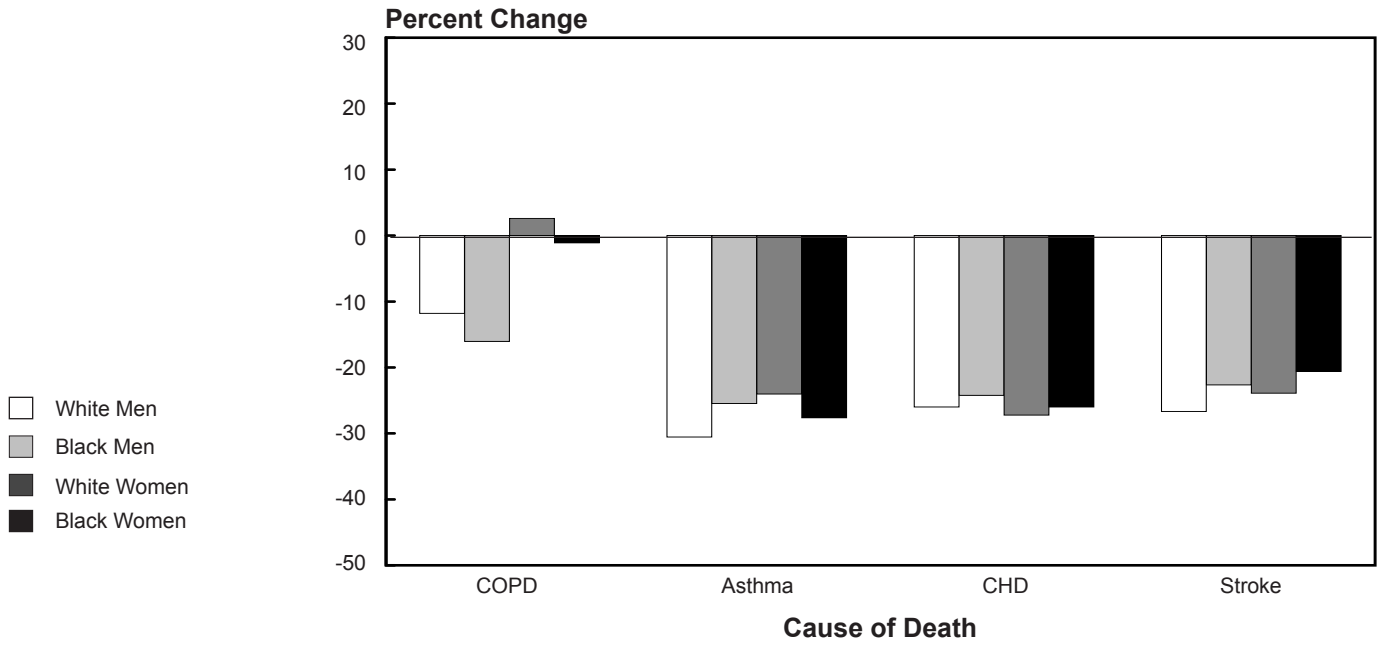
* Age adjusted to the European Standard Population.
Source: World Heath Statistics Annual, World Health Organization (WHO).

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



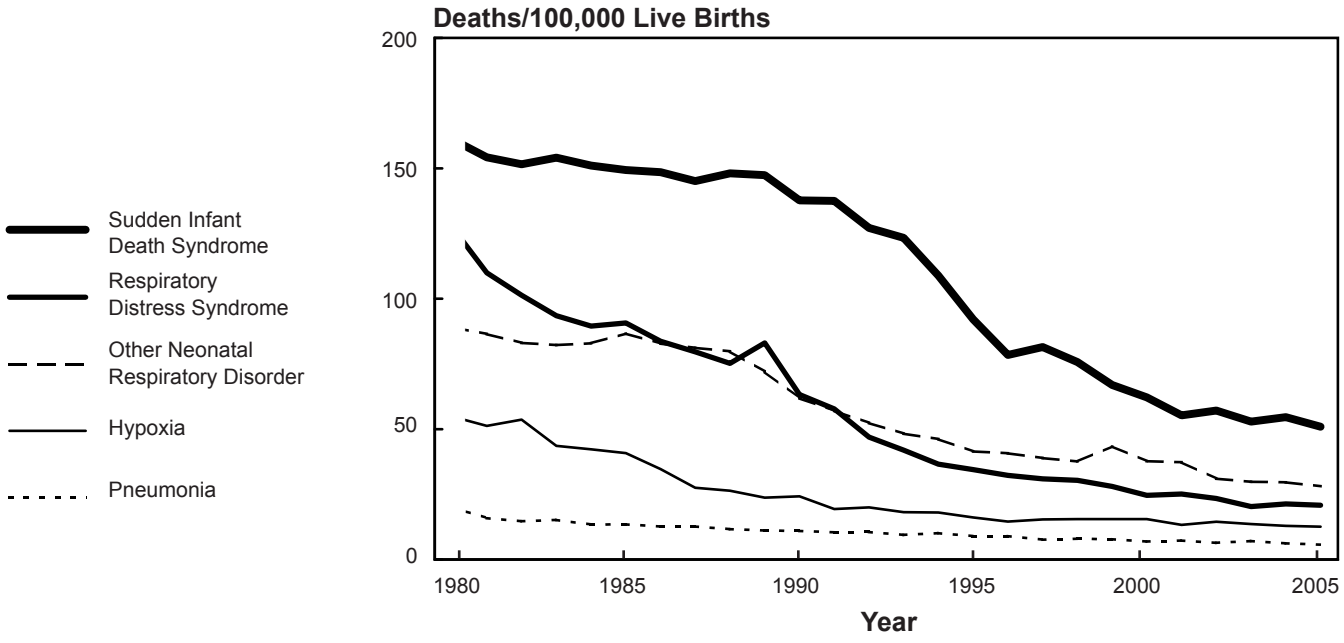
* Age adjusted to the European Standard Population.
Source: World Heath Statistics Annual, WHO.

Percent Change in Age-Adjusted Death Rates for Selected Causes by Race and Sex, U.S., 1999–2005*



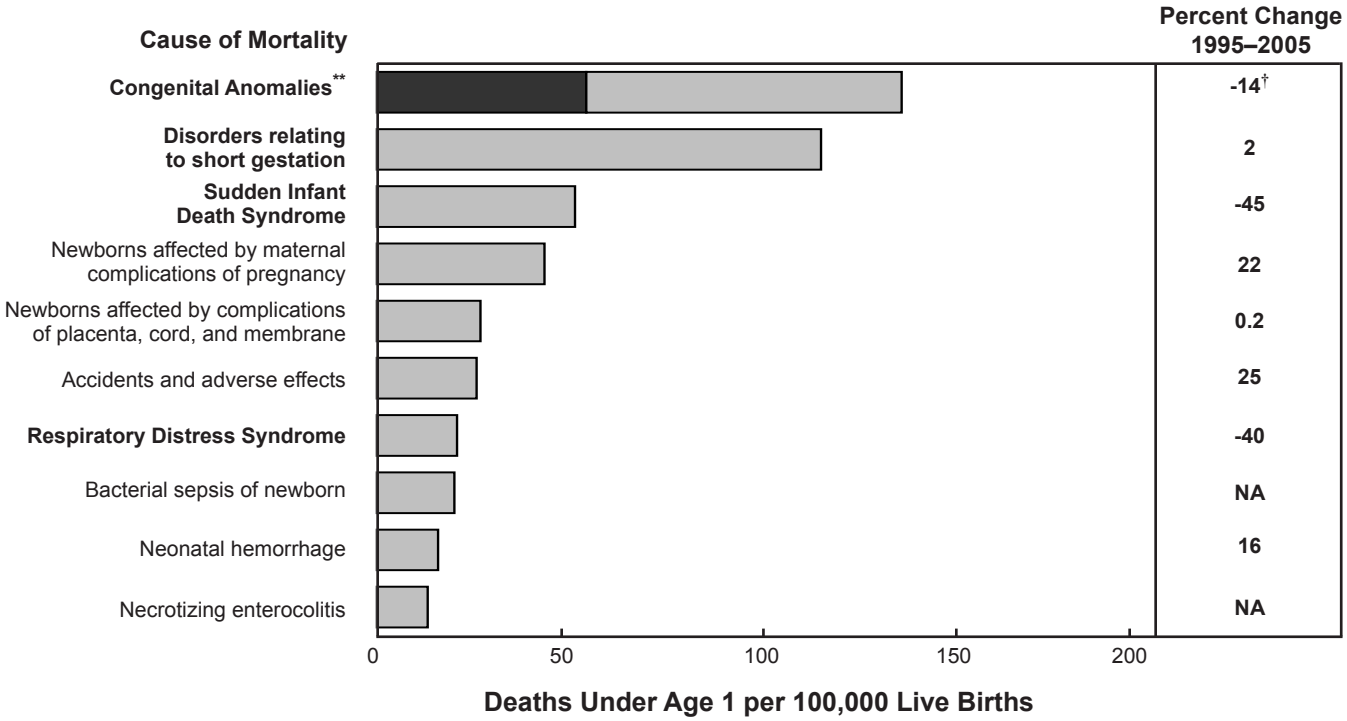
* Data for 2005 are preliminary.
Source: Vital Statistics of the United States, NCHS.

Death Rates for Lung Diseases in Infants, U.S., 1980–2005*



* Data for 2005 are preliminary.
Source: Vital Statistics of the United States, NCHS.

Ten Leading Causes of Infant Mortality, U.S., 2005*

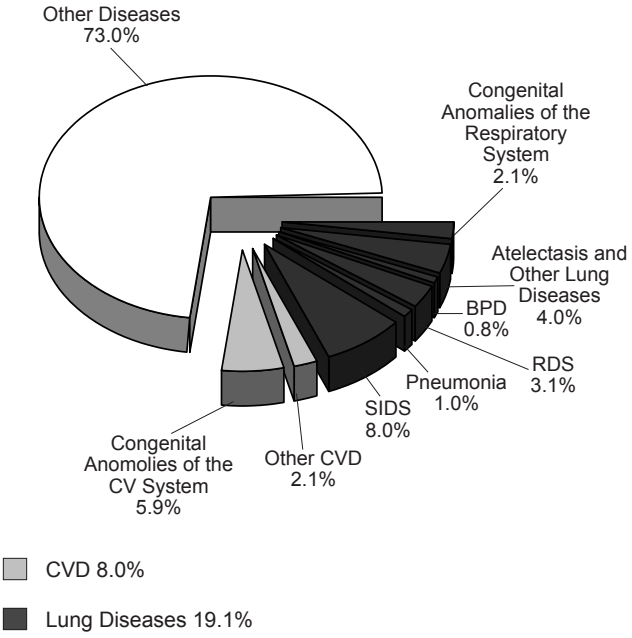


* Data for 2005 are preliminary.
** Congenital CVD and congenital respiratory diseases accounted for 53.7 deaths under age 1 per 100,000 live births (black bar), which is 40 percent of infant deaths due to all congenital anomalies.
† Between 1995 and 2005, congenital CVD declined 31 percent; congenital anomalies of the respiratory system declined 15 percent; other congenital anomalies increased 2 percent.
NA: Not available.
Note: Diseases shown in bold are those addressed in Institute programs.
Source: Vital Statistics of the United States, NCHS.

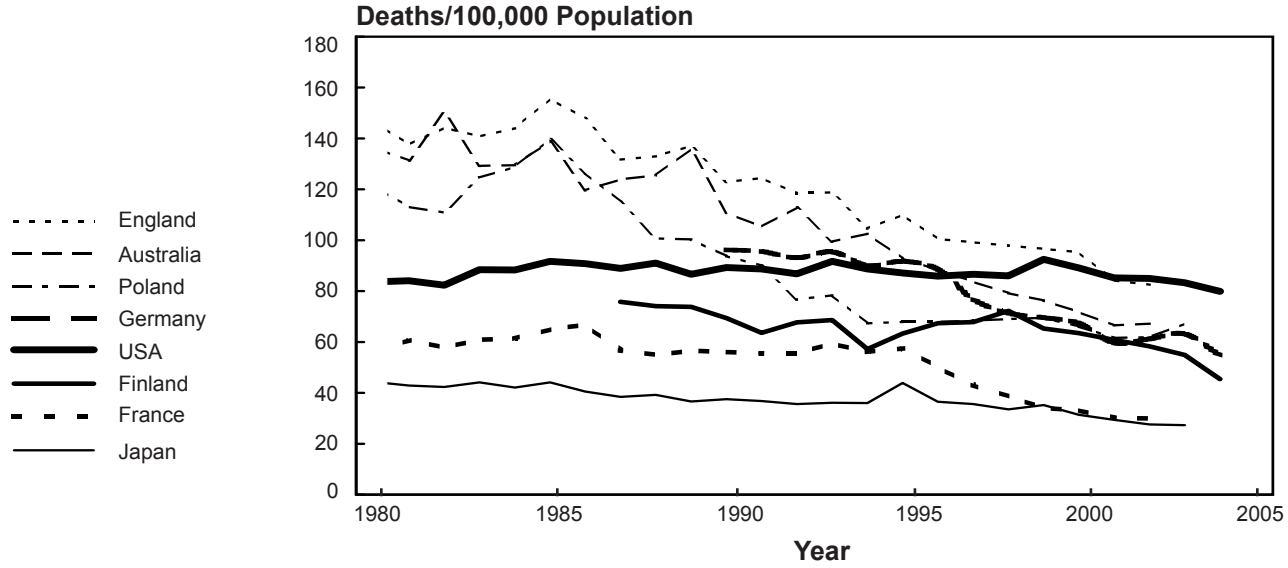
Deaths Under Age 1 Year Due to Cardiovascular and Lung Diseases, U.S., 2005*

Cause of Death	Deaths Under Age 1
All Causes	27,936
Cardiovascular Diseases	**2,239**
Congenital Anomalies	1,646
Other	593
Lung Diseases	5,335
Sudden Infant Death Syndrome	**2,246**
Respiratory Distress Syndrome	**875**
Pneumonia	273
Bronchopulmonary Dysplasia (BPD)	239
Atelectasis of Newborn	419
Congenital Anomalies	**580**
Other Lung Diseases	703
Other Diseases	20,362

* Data for 2005 are preliminary.
Note: Diseases shown in bold are those addressed in Institute programs.
Source: Vital Statistics of the United States, NCHS.

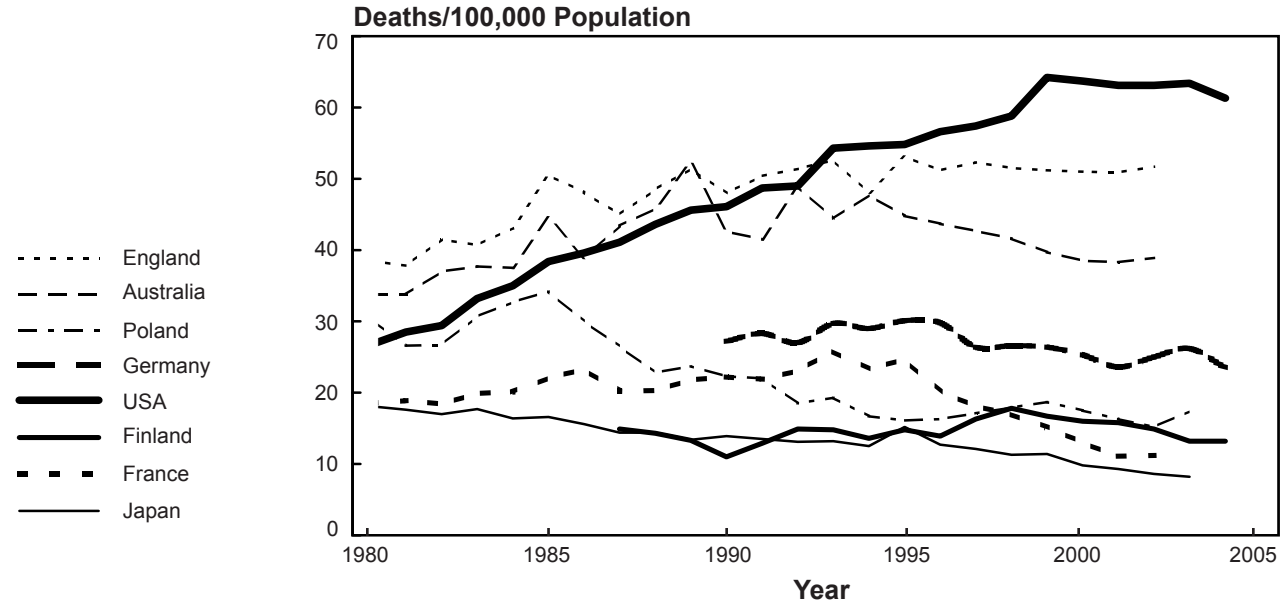


Death Rates* for Chronic Obstructive Pulmonary Disease in Men, Ages 35 and Older, in Selected Countries, 1980–2004



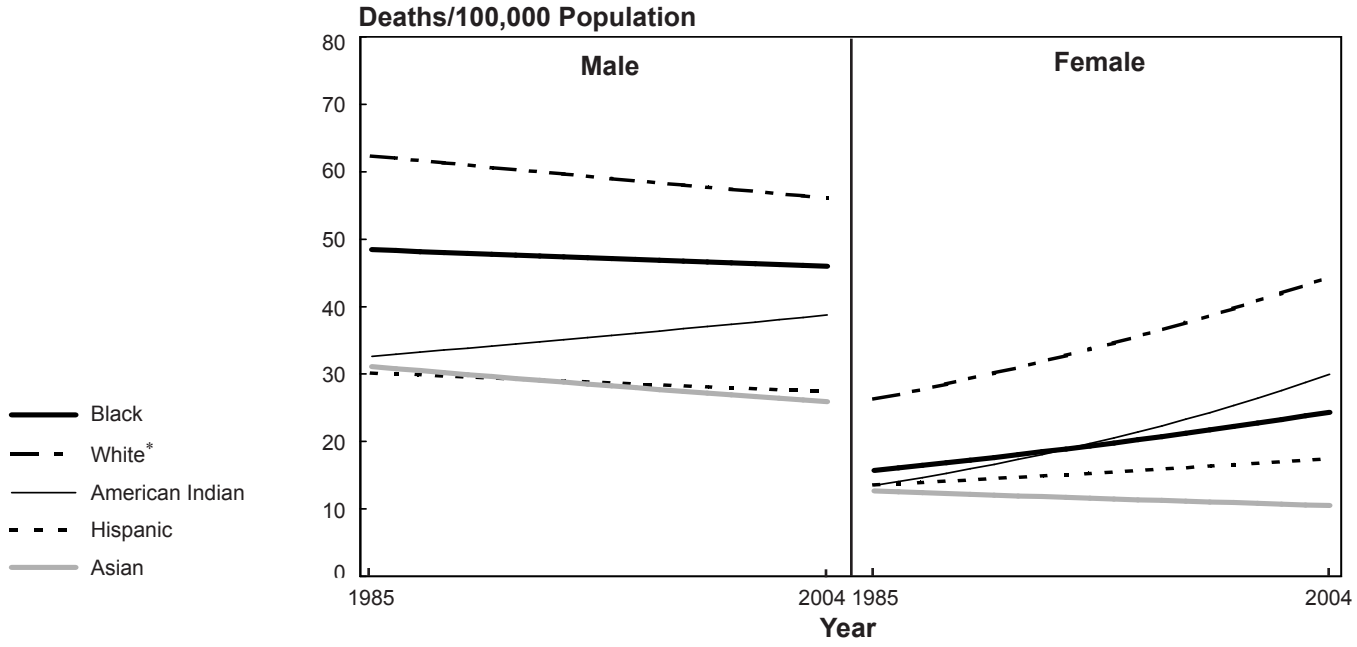
* Age adjusted to the European Standard Population.
Source: World Health Statistics Annual, WHO.

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



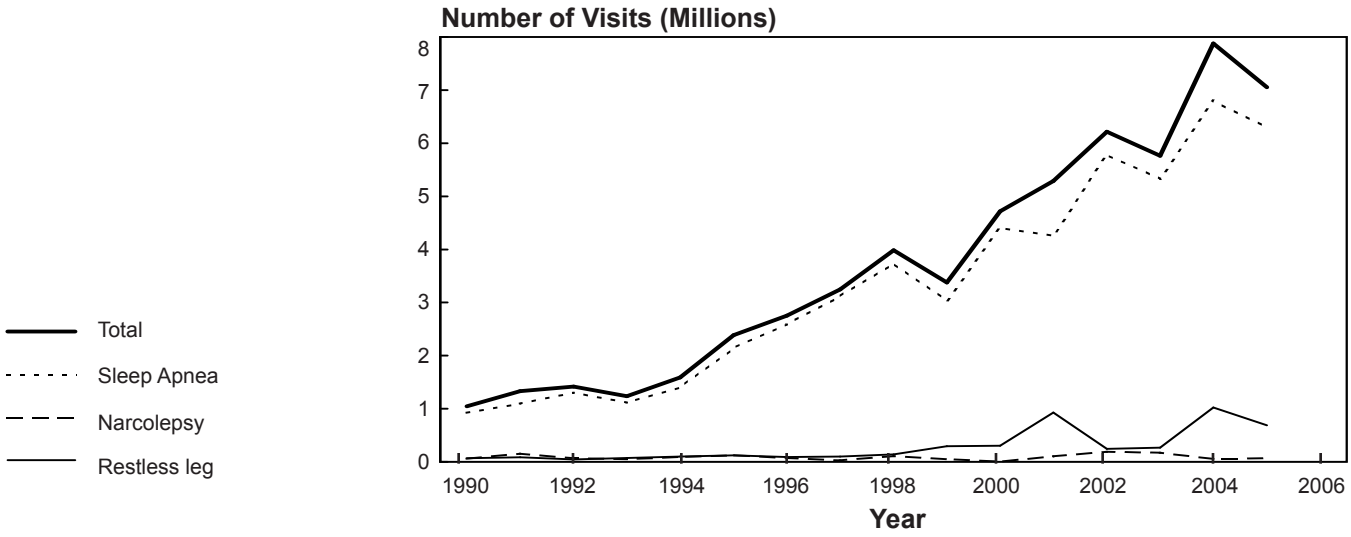
* Age adjusted to the European Standard Population.
Source: World Health Statistics Annual, WHO.

Age-Adjusted Death Rates for Chronic Obstructive Pulmonary Disease by Race/Ethnicity and Sex, U.S., 1985–2004



* Non-Hispanic.
Note: Each line is a log linear regression derived from the actual rates. Rates from 1985–1998 are modified by the ICD revision comparability ratio.
Source: Vital Statistics of the United States, NCHS.

Physician Office Visits for Sleep Disorders, U.S., 1990–2005



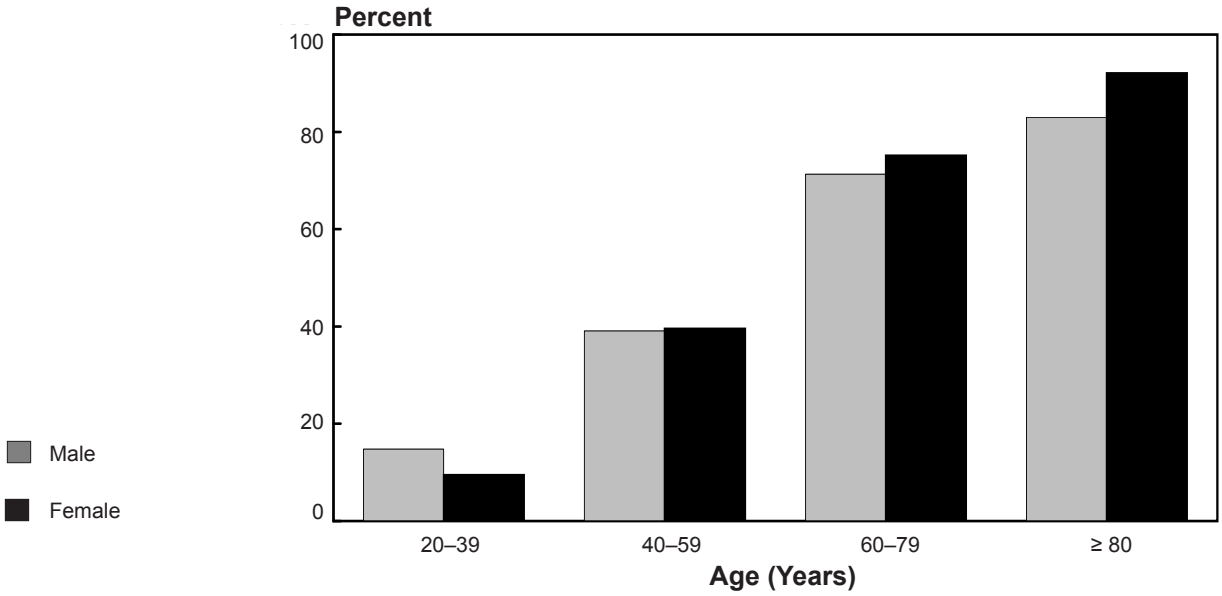
Note: Primary and secondary diagnoses.
Source: National Ambulatory Medical Care Survey, NCHS.

Prevalence of Common Cardiovascular and Lung Diseases, U.S., 2005

Disease	Number
Cardiovascular Diseases*	80,700,000
Hypertension**	73,000,000
Coronary Heart Disease	16,000,000
Heart Failure	5,300,000
Stroke	5,800,000
Congenital Heart Disease†	1,000,000
Asthma‡	22,000,000
COPD§	24,000,000

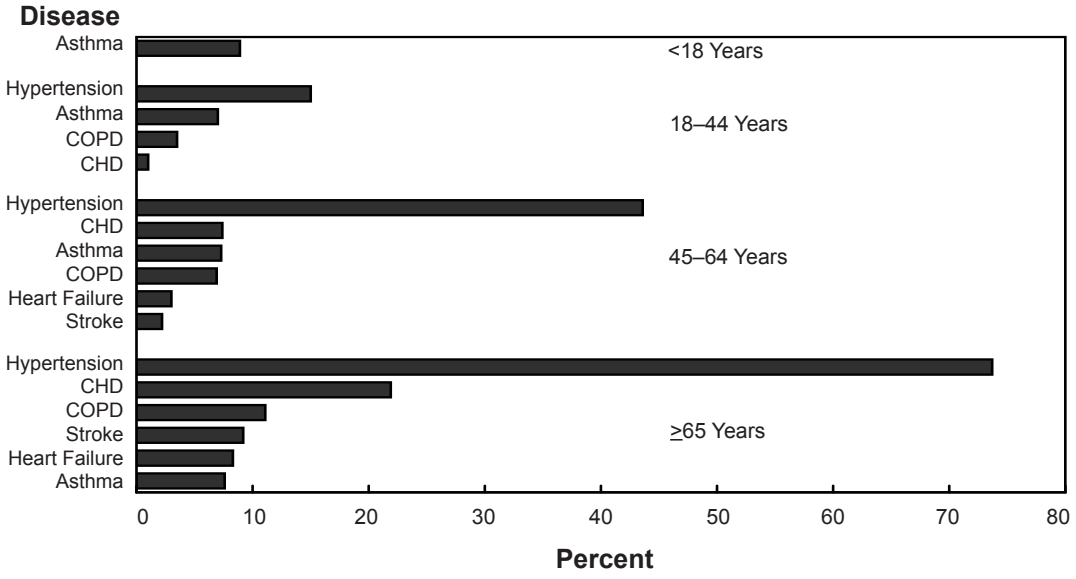
* Includes hypertension, CHD, heart failure, and stroke.
** Hypertension is defined as systolic blood pressure ≥ 140 mm Hg, or diastolic blood pressure ≥ 90 mm Hg, or being on antihypertensive medication, or being told twice of having hypertension.
† Range from 650,000 to 1,300,000.
‡ 12,000,000 of these 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 (NHANES) of NCHS and National Health Interview Survey (NHIS) of NCHS, except as noted.

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



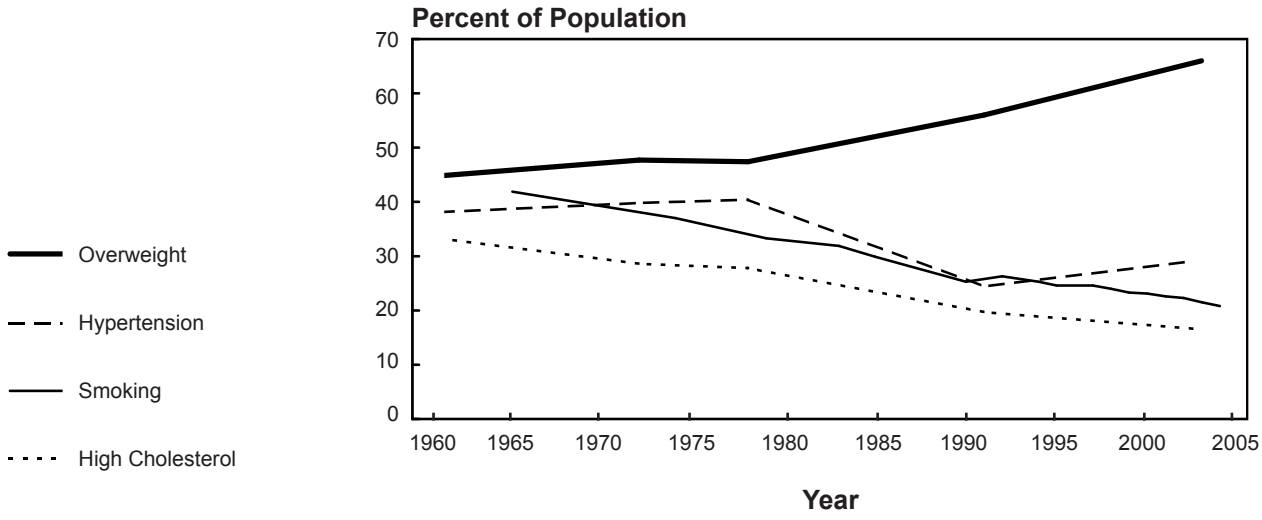
* Hypertension, CHD, cerebrovascular disease, or heart failure. Hypertension is defined as systolic blood pressure > 140 mm Hg, or diastolic blood pressure > 90, or being on antihypertensive medication.
Source: NHANES, 1999–2004 extrapolated to U.S., 2004.

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



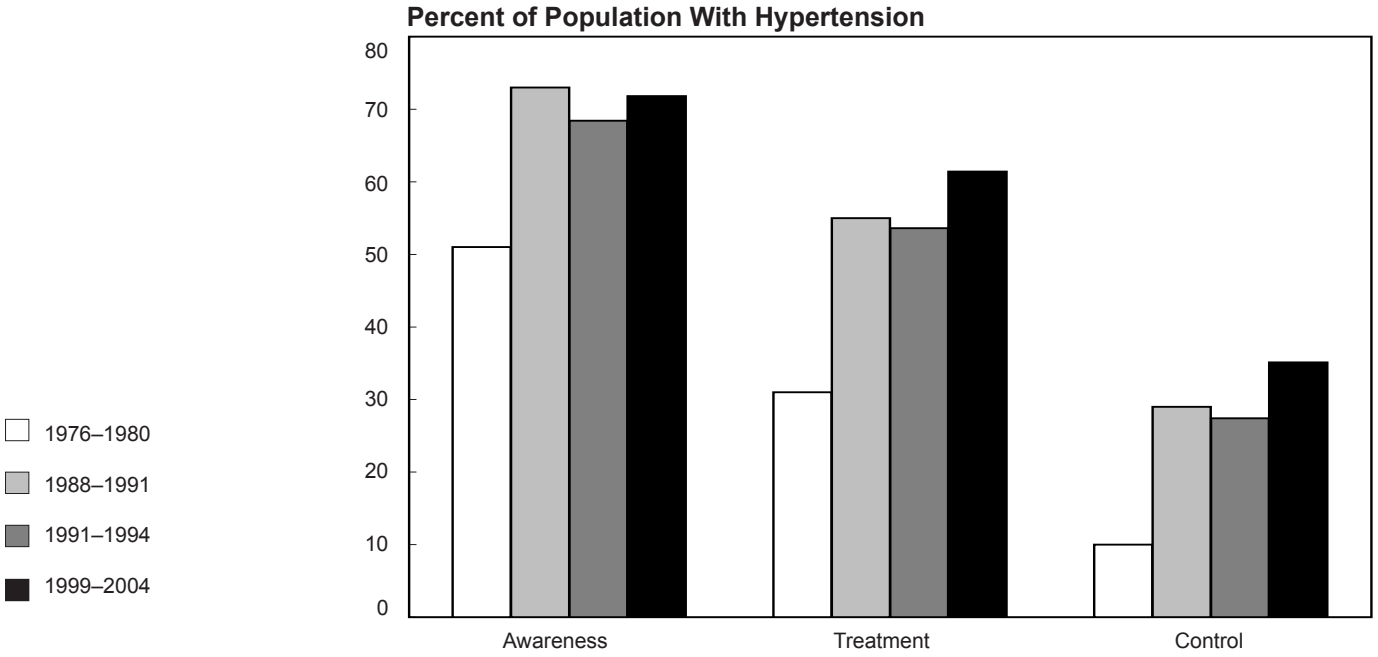
Sources: NHIS and NHANES.

Age-Adjusted Prevalence of Cardiovascular Disease Risk Factors in Adults, U.S., 1961–2004



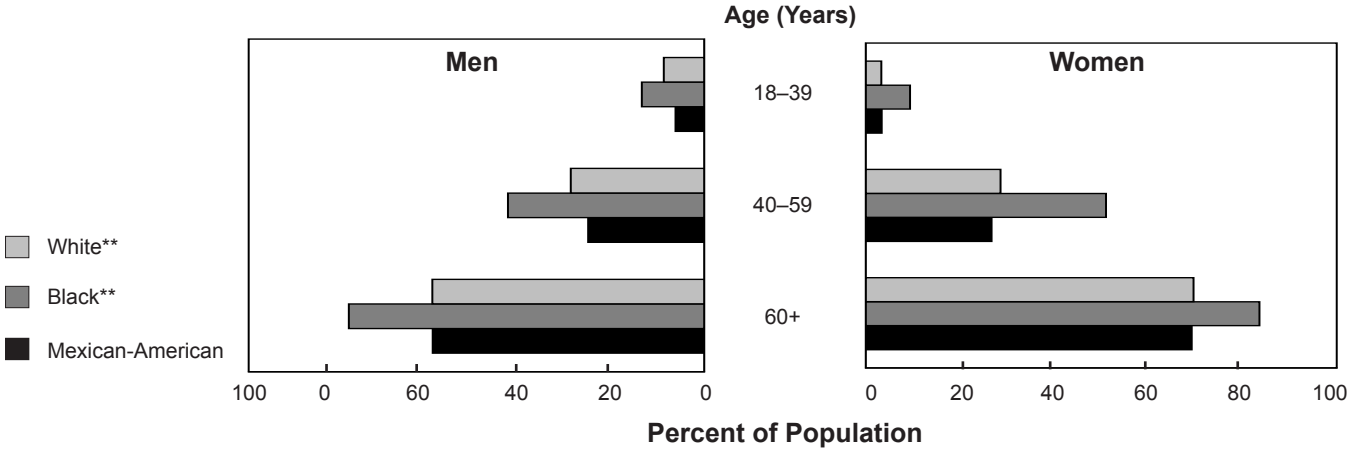
Note: Hypertension is defined as systolic blood pressure ≥ 140 mm Hg, or diastolic blood pressure is ≥ 90 mm Hg, or being on antihypertensive medication. High cholesterol is 240+ mg/dl. Overweight is BMI 25+ kg/m^2.
Sources: NHIS for smoking, ages ≥18 and NHANES for the other risk factors, ages 20–74.

Hypertensive* Population Aware, Treated, and Controlled, Ages 18 and Older, U.S., 1976–1980 to 1999–2004



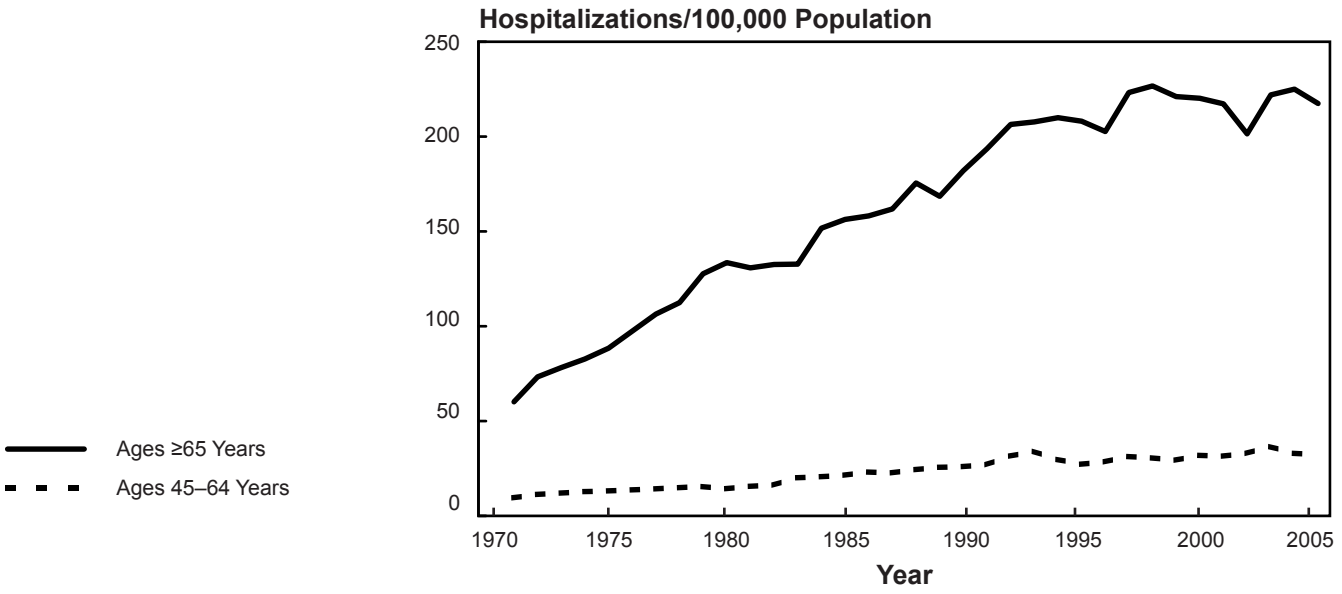
* Hypertension is defined as systolic blood pressure ≥ 140 mm Hg, or diastolic blood pressure ≥ 90 mm Hg, or being on antihypertensive medication.
Source: NHANES, NCHS.

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



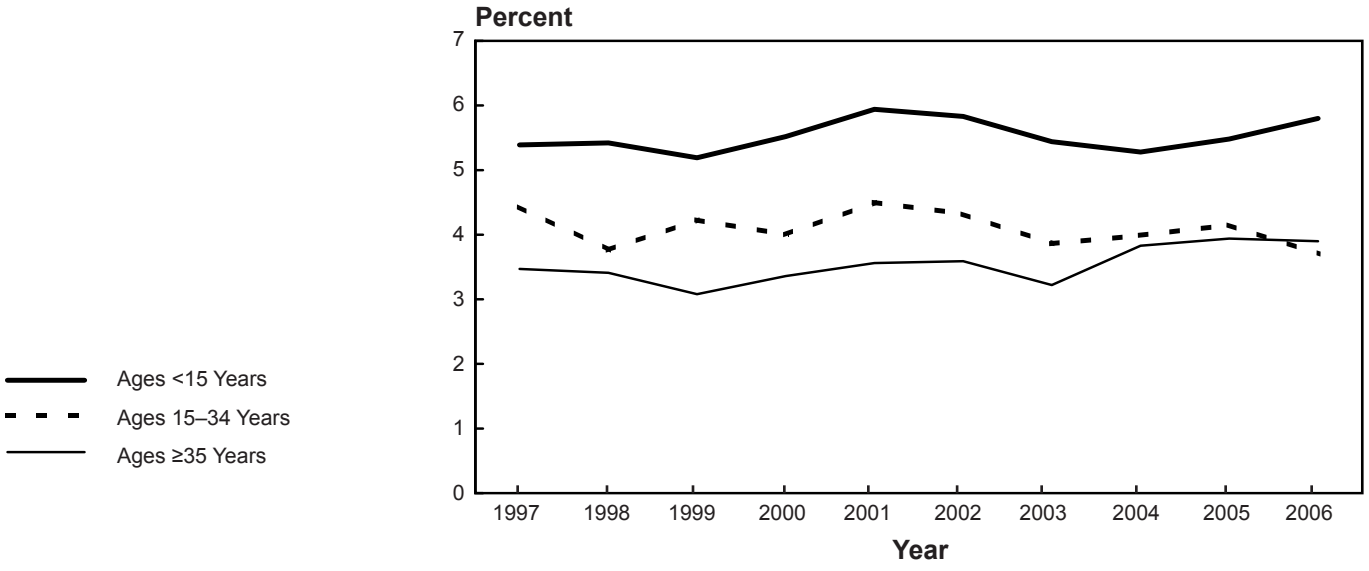
* Hypertension is systolic blood pressure ≥ 140 mm Hg, diastolic blood pressure ≥ 90 mm Hg, or being on antihypertensive medication.
** Non-Hispanic.
Sources: NHANES and NCHS.

Hospitalization Rates for Heart Failure, Ages 45–64 and 65 and Older, U.S., 1971–2005



Source: National Hospital Discharge Survey, NCHS.

Persons Experiencing Asthma Episodes in Previous 12 Months by Age, U.S., 1997–2006



Source: NHIS, NCHS.

Direct and Indirect Economic Costs of Illness by Major Diagnosis, U.S., 2008

	Amount (Dollars in Billions)				Percent Distribution			
		Indirect Costs				Indirect Costs		
	Direct Costs*	Morbidity**	Mortality†	Total	Direct Costs	Morbidity	Mortality	Total
Cardiovascular Disease	$ 296.4	$ 37.6	$114.5	$ 448.5	15.3%	17.0%	20.4%	16.5%
(including Blood Clotting)‡	*(69.6)*	*(8.3)*	*(26.7)*	*(104.6)*	*(3.6)*	*(3.7)*	*(4.8)*	*(3.8)*
Lung Diseases§	99.4	28.9	31.5	159.8	5.1	13.0	5.6	5.9
Blood Diseases	10.6	0.7	3.0	14.3	0.5	0.3	0.5	0.5
Subtotal	406.4	67.2	149.0	622.6	20.9	30.3	26.5	22.9
Diseases of the Digestive System	209.3	11.4	25.5	246.2	10.8	5.1	4.5	9.0
Neoplasms	93.2	18.8	116.1	228.1	4.8	8.5	20.7	8.4
Mental Disorders	165.6	29.2	9.6	204.4	8.5	13.2	1.7	7.5
Diseases of the Nervous System	147.5	8.7	13.0	169.2	7.6	3.9	2.3	6.2
Diseases of the Musculoskeletal System	116.7	22.6	2.9	142.2	6.0	10.2	0.5	5.2
Diseases of the Genitourinary System	87.3	5.8	6.9	100.0	4.5	2.6	1.2	3.7
Endocrine, Nutritional, and Metabolic Diseases	80.6	7.2	20.5	108.3	4.2	3.2	3.7	4.0
Infectious and Parasitic Diseases	41.6	13.5	26.6	81.7	2.1	6.1	4.7	3.0
Diseases of the Skin	46.5	1.6	0.7	48.8	2.4	0.7	0.1	1.8
Other and Unallocated to Diseases	546.6	35.5	190.5	772.6	28.2	16.0	33.9	28.4
Total	**$1,941.3**	**$221.5**	**$561.3**	**$2,724.1**	**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 2008 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 2008 total by type of direct cost.

** Morbidity costs were estimated for 2008 by multiplying NCHS estimates for 1980 by a 1980–2008 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 2008 by first multiplying the number of deaths in 2004 in each age- and sex-specific group by the 2003 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 2003–2008 inflation factor (1.14) based on change in mean earnings.

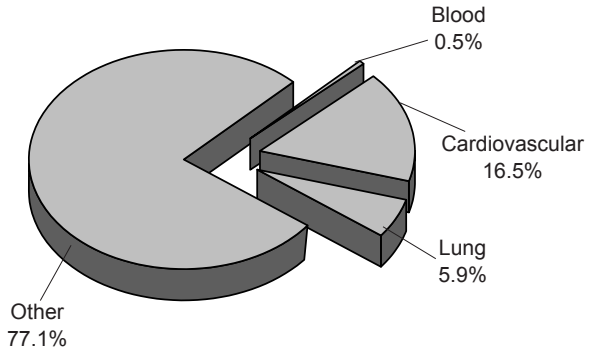
‡ Costs of blood clotting disease are estimated from predetermined proportions of CVD morbidity and mortality statistics for MI, cerebrovascular diseases, and diseases of arteries.

§ Does not include lung cancer or leukemia.

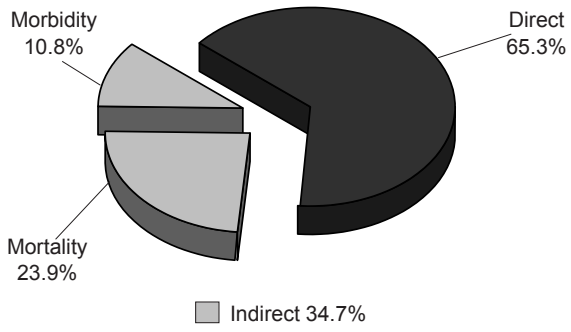
Note: Numbers may not add to totals due to rounding.

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

Total Economic Costs, U.S., 2008



Economic Costs of Cardiovascular, Lung, and Blood Diseases, U.S., 2008



5. Institute-Initiated Programs Starting in FY 2007

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 Experts (BEE), and the National Heart, Lung, and Blood Advisory Council (NHLBAC). The advisory committees and the BEE, 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 BEE, which reviews and prioritizes them. The concepts, along with the comments from the BEE, 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 2007 are presented below according to NHLBI scientific programs. Also described are trans-NIH and inter-Agency initiatives in which the NHLBI participates.

Heart and Vascular Diseases Program

Initiative Being Renewed

Summer Institute for Training in Biostatistics

The purpose of this renewal is to develop, conduct, and evaluate a 6-week summer course in basic principles, methodologies, and applications of biostatistics in clinical research with relevant examples from heart, lung, and blood diseases and sleep disorders.

New Initiatives

Cardiovascular Cell Therapy Research Network

The purpose of this RFA is to establish a network to develop, conduct, and evaluate multiple, collaborative, cell-based therapies for the management of CVD.

Cardiovascular Research Network in Community-Based Care

The purpose of this RFA is to establish a cardiovascular research network to increase scientific knowledge of CVD—including epidemiology, risk and risk factors, prevention, detection and diagnosis, treatment, and prognosis—in the context of community-based health care delivery. The program will facilitate the conduct of CVD research across multiple heath care organizations; conduct multisite, collaborative research using integrated data systems; and perform short-term investigation of emerging public health issues.

Lung Diseases Program

New Initiatives

Career Development Program in the Genetics and Genomics of Lung Diseases

The purpose of this RFA is to create multidisciplinary career development programs in genetics and genomics of lung diseases that will equip new investigators with the knowledge and skills to become independent investigators and assume academic leadership roles in this rapidly evolving field.

Collaborative Studies on Lung Stem Cell Biology and Cell-Based Therapy

The purpose of this RFA is to foster collaborative research between basic scientists and clinical investigators that will lead to cell-based therapies for lung diseases.

Longitudinal Studies of HIV-Associated Lung Infections and Complications

The purpose of this RFA is to conduct longitudinal studies to characterize HIV-associated lung infections and their complications and consequences in existing HIV-infected cohorts and other established HIV-infected patients groups.

Long-Term Oxygen Treatment Trial

The purpose of this RFP is to determine the efficacy of long-term oxygen treatment for improving survival in patients with COPD and less-than-severe hypoxemia at rest.

Specialized Centers of Clinically Oriented Research in Chronic Obstructive Pulmonary Disease

The purpose of this SCCOR is to establish centers that will conduct multidisciplinary research on COPD and promote rapid translation of basic scientific findings into clinical applications for its diagnosis, treatment, and prevention. The initiative will emphasize research that answers clinically relevant questions that enable basic science findings to be applied more rapidly to clinical problems.

Specialized Centers of Clinically Oriented Research in Pulmonary Vascular Disease

The purpose of this SCCOR is to conduct multidisciplinary research to answer clinically relevant questions related to the diagnosis, prevention, and treatment of pulmonary vascular disease. The initiative will address research on primary (idiopathic) and secondary pulmonary arterial hypertension, acute and chronic pulmonary thromboembolism, right ventricular dysfunction, and pulmonary vascular disorders in infants and children.

Blood Diseases and Resources Program

Initiative Being Renewed

Transfusion Medicine/Hemostasis Clinical Trials Network

The purpose of this renewal is to continue support for the Network to evaluate promising new therapies for hemostatic disorders, such as idiopathic thrombocytopenic purpura and thrombotic thrombocytopenic purpura, and to evaluate new blood products, especially platelets and platelet substitutes and cytokines, such as thrombopoietin.

New Initiatives

Pediatric Transfusion Medicine Academic Career Awards

The purpose of this RFA is to establish a training program for curriculum development and implementation in pediatric transfusion medicine and to attract young investigators into the field.

Retrovirus Epidemiology Donor Study-II: Refinement and Manufacture of HIV EIA and Rapid Tests for Use in HIV Vaccine Trials

The purpose of this RFP is to support refinement and manufacture of HIV-SELECTEST enzyme-linked immuno-absorbent assay (EIA) kits and a Rapid HIV-1 Antibody Test for distribution to national and international laboratories conducting Phase II/III HIV-1 vaccine trials. The diagnostic tests should allow investigators to differentiate between participants recently infected with HIV and HIV-negative vaccinated participants.

Trans-NHLBI

Initiatives Being Renewed

Ancillary Studies in Clinical Trials

The purpose of this renewal is to support time-sensitive ancillary studies in conjunction with ongoing clinical trials of cardiovascular, lung, and blood diseases and sleep disorders. Information gained from the studies will permit better correlation of clinical course and outcome and lead to improved prognostic assessments and patient care.

NHLBI Genelink

The purpose of this renewal is to support an infrastructure established in 2003 to facilitate gene finding by (a) promoting sharing of results of genetic analyses; (b) providing an open resource of linked, searchable linkage, and association analysis results placed on a common physical map; and (c) providing bioinformatics tools to assist researchers in prioritizing and following up findings from linkage and genome-wide association studies.

Programs in Gene by Environment Interaction

The purpose of this renewal is to support a unique collaborative structure established in 2002 to search for genetic variants influencing response to prescribed environmental changes using a family-based approach.

Summer Institute Program To Increase Diversity in Health-Related Research

The purpose of this renewal is to develop the research skills of faculty and scientists who are from underrepresented racial and ethnic groups or disadvantaged background or who have disabilities so that they may successfully compete for funding for biomedical and behavioral research relevant to heart, lung, and blood diseases and sleep disorders.

New Initiatives

Computational Modeling for Heart, Lung, Blood, and Sleep Biologists: Introductory Courses

The purpose of this RFA is to develop, implement, and evaluate short courses (optimally 1 to 2 weeks) in computational modeling for biomedical researchers and clinical scientists. The goal of the courses is to promote interdisciplinary research and training by increasing the number of researchers with knowledge and skills to apply experimental and computational approaches to heart, lung, blood, and sleep research.

Genome-Wide Association Studies To Identify Genetic Components That Relate to Heart, Lung, and Blood Disorders

The purpose of this RFA is to support genome-wide association studies by using existing population, family, and clinical studies to identify genetic components related to heart, lung, and blood disorders and their risk factors.

NHLBI Gene Therapy Resource Program

The purpose of this RFP is to promote the translation of gene therapy from the bench to the bedside. The Program will comprise a Clinical Coordinating Center, a preclinical grade vector production core laboratory, two clinical grade vector production core laboratories, and a pharmacology/toxicology core laboratory.

Trans-NIH

Initiatives Being Renewed

Bioengineering Approaches to Energy Balance and Obesity

The purpose of this renewal is to develop and evaluate innovative engineering approaches to clinical problems related to energy balance, intake, and expenditure. Engineers, physical scientists, mathematicians, and scientists from relevant disciplines with expertise in obesity and nutrition are encouraged to collaborate in research leading to the development of new technologies and tools that will improve the ability of scientists to address problems of weight control and obesity.

Bioengineering Research Grants

The purpose of this renewal is to encourage multidisciplinary, integrative research that applies systems approaches to prevent, detect, diagnose, or treat disease or to improve understanding of health and behavior. These grants differ from Bioengineering Research Partnerships in that the research is performed in a single laboratory, by a single investigator, or by a small group of investigators.

Bioengineering Research Partnerships

The purpose of this renewal is to encourage multidisciplinary, integrative research partnerships that apply systems approaches to prevent, detect, diagnose, or treat disease or to improve understanding of health and behavior.

Career Enhancement Award for Stem Cell Research

The purpose of this renewal is to support investigators who seek training in the use of stem cells in research. Candidates must have as a mentor a sponsor who is a well-qualified stem cell expert.

Clinical Research Education and Career Development in Minority Institutions

The purpose of this renewal is to develop and implement a curriculum leading to an accredited Master of

Science in Clinical Research or an accredited Master of Public Health in a clinically relevant area for doctoral and postdoctoral candidates at minority institutions. The 5-year program consists of two phases. Phase I lasts 2 years and offers a structured curriculum and mentored clinical research training that leads to a Master's degree. Phase II provides continued mentoring and career development in clinical research for up to 3 years as part of the training and skill development to become an independent clinical investigator.

Exploratory/Developmental Bioengineering Research Grants

The purpose of this renewal is to support innovative, high-risk exploratory or developmental bioengineering research whether or not preliminary results have been obtained.

Exploratory/Developmental Research Grants

The purpose of this renewal is to encourage novel scientific ideas, model systems, tools, agents, targets, and technologies that have the potential to substantially advance biomedical research. R21 awards allow investigators with innovative ideas to obtain support for early and conceptual-stage research without the need for large amounts of preliminary data that often serves as a barrier to entry into the NIH grants system.

Independent Scientist Award

The purpose of this renewal is to foster the research development of promising individuals in the formative years of their career by providing salary support and protected time for 3 to 5 years.

Mentored Clinical Scientist Research Career Development Award

The purpose of this renewal is to provide support and protected time for intensive, supervised research career development in biomedical, behavioral, and translational research.

Mentored Quantitative Research Career Development Award

The purpose of this renewal is to support the career development of investigators with quantitative scientific and engineering backgrounds outside of biology or medicine who have made a commitment to focus their research endeavors on biomedicine, bioengineering, biobehavioral, or biomedical research.

National Research Service Awards for Individual Postdoctoral Fellows

The purpose of this renewal is to ensure that diverse pools of highly trained scientists will be available in adequate numbers and in appropriate research areas to carry out the Institute's biomedical, behavioral, and clinical research agendas.

Research on Sleep and Sleep Disorders

The purpose of this renewal is to advance biomedical knowledge related to sleep and sleep disorders, improve understanding of the neurobiology and functions of sleep over the lifespan, enhance timely diagnosis and effective treatment for individuals affected by sleep-related disorders, and implement and evaluate innovative community-based public health education and intervention programs.

New Initiatives

Anemia in the Elderly

The purpose of this RFA is to determine the epidemiology, pathophysiology, and clinical aspects of anemia in the elderly. Research findings should lead to improvements in the health and well-being of elderly patients with anemia and decrease functional impairment and morbidity associated with anemia in this population.

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

The purpose of this PA is to define factors and mechanisms that control differentiation of embryonic or adult stem or progenitor cells. The ultimate goal of the program is to develop methods to direct differentiation or development of stem cells along specific cell lineages to yield replacement cells for clinical use, whether the replacement cells are formed in vitro for delivery or in vivo in the tissue or organ environment.

Effect of Racial and Ethnic Discrimination/Bias on Health Care Delivery

The purpose of this PA is to stimulate research on improving measures (i.e., instrumentation, data collection, and statistical/analytical techniques) of racial/ethnic discrimination in health care delivery systems; to enhance understanding of the influence of discrimination in health care delivery and its association with disparities in disease incidence, treatment, and outcomes; and

to reduce prevalence of health disparities by developing interventions to reduce the influence of discrimination on health care delivery systems in the United States.

Environmental Pathways and Susceptibility: Comparative Biology Elucidation

The purpose of this RFA is to understand the responses of biological pathways and networks to perturbation by environmental factors, stressors, or alcohol that can alter an individual's susceptibility to complex human diseases. The NHLBI is interested in combining comparative genomics and other "omics" (e.g., proteomics, transcriptomics, metabolomics) with informatics and high throughput technologies (RNA interference, tissues arrays) into a comprehensive pathway-driven approach to study environmental factors that contribute to heart, lung, or blood diseases or sleep disorders.

Heterogeneity of Fat Depots: Underlying Basis and Association With Morbidity

The purpose of this PA is to explore the fundamental mechanisms contributing to the heterogeneity of fat depots and to determine how these differences correlate with obesity and its associated morbidities. The goal of the initiative is to increase understanding of the interactions among cell populations in order to identify biomarkers of changes in cellular physiology and metabolism brought on by obesity. Research findings are expected to yield new targets for therapeutics to disrupt the progression of obesity to diabetes, atherosclerosis, and hypertension.

Improved Measures of Diet and Physical Activity for the Genes and Environment Initiative

The purpose of this RFA is to develop new or to improve existing sensor devices and systems that can be used in free-living populations to provide quantitative, reliable, field-deployable measurement of personal-level exposure to dietary intake and physical activity.

Individual Predoctoral Fellowships To Promote Diversity in Health-Related Research

The purpose of this PA is to improve diversity of the health-related research workforce by supporting the training of predoctoral students from underrepresented groups (i.e., students from underrepresented racial and ethnic groups, students with disabilities, and students from disadvantaged backgrounds).

Innovative Applications of Nanotechnology to Heart, Lung, Blood, and Sleep Disorders

The purpose of this PA is to encourage innovative, high-risk strategies based on nanotechnology to diagnose and treat heart, lung, and blood diseases and sleep disorders and to identify environmental influences on those conditions.

Methods of Analysis of Gene–Environment Interactions in Complex Diseases: The Genes and Environment Initiative

The purpose of this RFA is to encourage collaborations among scientists from the fields of genetics, environmental health, epidemiology, biostatistics, and bioinformatics to develop and evaluate innovative strategies for identifying gene–environment interactions in genome-wide association, sequencing, linkage, or candidate gene studies in complex diseases.

NIH Pathway to Independence Award

The purpose of this PA is to increase and maintain a strong cohort of new and talented NIH-supported independent investigators by fostering the transition of postdoctoral scientists from mentored environments to independence.

Nuclear Receptor Signaling Consortium

The purpose of this renewal is to complete the development and implementation of an atlas of nuclear hormone receptors (NHR). The Consortium is responsible for (a) developing critical resources, datasets, and reagents; (b) developing novel technologies and new concepts in NHR and coregulator biology; (c) designing studies with immediate translational effect on human disease, and (d) promoting activities to ensure communication of ideas, resources, and technologies to the broader research community.

Relationship Between Hypertension and Inflammation

The purpose of this PA is to study the interaction between hypertension and inflammation and to determine whether a causal relationship exists between the elevation of blood pressure and the production of inflammatory factors.

Venous Thrombosis and Thromboembolism in the Elderly

The purpose of this RFA is to understand the factors that contribute to the age-related increase in risk of

thrombosis and thromboembolism in the elderly and to translate that knowledge to improvements in diagnosis, treatment, and prevention.

Trans-PHS

New Initiative

Chronic Obstructive Pulmonary Disease: Subpopulations and Intermediate Outcome Measures

The purpose of this RFP is to define pathogenetically homogeneous subgroups of individuals with COPD based on biomarkers, genotypes, and CT images and to identify intermediate outcome measures for use in future clinical trials.

Interagency

New Initiative

Network for Cardiothoracic Surgical Investigations in Cardiovascular Medicine

The purpose of this RFA is to establish a cooperative network of academic centers with cardiothoracic surgeons and their colleagues in allied specialties that will foster rigorous scientific evaluation of newer surgical techniques, technologies, and devices or innovative pharmaceutical and bioengineered products directed toward CVD and to provide a scientific basis for their use. The Network will also serve as a clinical trials training ground for fellows and junior faculty.

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, diagnosis, and treatment of diseases and resources within the purview of the Institute. 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 assemble ad hoc working groups, 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 231 of the Public Health Service Act, as amended.

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

Jeanine Arden Ornt, J.D. (2010)
Case Western Reserve University

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

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

Shaun R. Coughlin, M.D., Ph.D. (2010)
University of California, San Francisco

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

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

Joe G. N. Garcia, M.D. (2010)
University of Chicago

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, Ph.D. (2009)
University of Arizona

J. Hoxi 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

S. K. Rao Musunuru, M.D. (2010)
Bayonet Point/Hudson Cardiology Associates

Paula Y. Polite (2010)
Division of General Services, Memphis

Steven D. Shapiro, M.D. (2010)
University of Pittsburgh

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 2007. 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: F. Daniel 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 A. Bender, M.D., Ph.D. (2010)
Fred Hutchinson Cancer Research Center

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

Punam Malik, M.D. (2010)
Cincinnati Children's Hospital Medical Center

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

Dorothy C. Moore, M.D. (2007)
Sickle Cell Disease Association of America

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

Ex Officio Members

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

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

John T. Farrar, M.D.
Department of Veterans Affairs

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

David E. McCune, M.D.
Madigan Army Medical Center

Enrique Mendez, Jr., M.D.
Department of Defense

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., 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

* Current as of October 2007.

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

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

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

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

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

Anand K. Parekh, M.D., M.P.H.
Department of Health and Human Services

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

* Current as of October 2007.

Heart, Lung, and Blood Initial Review Group

Scientific Review Officer: 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 three subcommittees: the Heart, Lung, and Blood Program Project Review Committee, the Clinical Trials Review Committee, and the NHLBI Institutional Training Mechanism Review Committee.

Heart, Lung, and Blood Program Project Review Committee

Chair: Howard A. Rockman, M.D., Duke University Medical Center

Scientific Review Officer: 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

Karen E. Bornfeldt, Ph.D. (2011)
University of Washington

Peng-Sheng Chen, M.D. (2010)
Indiana University School of Medicine

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

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

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

Catherine C. Hedrick, Ph.D. (2011)
University of Virginia

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

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

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

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

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

Curt D. Sigmund, Ph.D. (2011)
University of Iowa

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

Arun Srivastava, Ph.D. (2011)
University of Florida

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 Officer: 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

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)
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Pamela Ouyang, M.D. (2010)
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Julio A. Panza, M.D. (2009)
Washington Hospital 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 2007.

NHLBI Institutional Training Mechanism Review Committee

Chair: William C. Balke, M.D., University of Kentucky

Scientific Review Officer: Charles Joyce, Ph.D., Health Science Administrator, Division of Extramural Research Activities, NHLBI, National Institutes of Health, Bethesda, MD 20892; 301–435–0291

NHLBI Institutional Training Mechanism Review Committee provides initial technical merit review for the NHLBAC and the Director of the NHLBI on training applications that provide predoctoral, postdoctoral, and short-term research training at academic institutions.

Membership*

Ifeanyi J. Arinze, Ph.D. (2008)
Meharry Medical College

Linda J. Burns, M.D. (2011)
University of Minnesota

David M. Center, M.D. (2011)
Boston University Medical Campus

David M. Guidot, M.D. (2010)
Emory University

Meredith Hay, Ph.D. (2009)
University of Iowa

Carlton A. Hornung, Ph.D. (2010)
University of Louisville

Mariell Jessup, M.D. (2009)
University of Pennsylvania Health System

Craig K. Kent, M.D. (2010)
Weill Medical College of Cornell University

Bertram H. Lubin, M.D. (2010)
Children's Hospital Oakland Research Institute

Russell V. Luepker, M.D. (2008)
University of Minnesota

Jonathan C. Makielski, M.D. (2008)
University of Wisconsin Hospitals and Clinics

Fernando J. Martinez, M.D. (2009)
University of Michigan at Ann Arbor

Josef T. Prchal, M.D. (2008)
University of Utah

Sharon Rounds, M.D. (2010)
Brown University

Robin Shandas, Ph.D. (2008)
University of Colorado Health Sciences Center

Sanjeev G. Shroff, Ph.D. (2010)
University of Pittsburgh

Brian Smith, M.D. (2011)
Yale University School of Medicine

Marilyn J. Telen, M.D. (2009)
Duke University Medical Center

Mary I. Townsley, Ph.D. (2008)
University of South Alabama

Donna H. Wang, M.D. (2011)
Michigan State University

Scott T. Weiss, M.D. (2011)
Brigham and Women's Hospital

Marlys H. Witte, M.D. (2009)
University of Arizona

Reen Wu, Ph.D. (2011)
University of California at Davis

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

* Current as of October 2007.

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

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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.

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University of California, San Francisco

* Current as of October 2007.

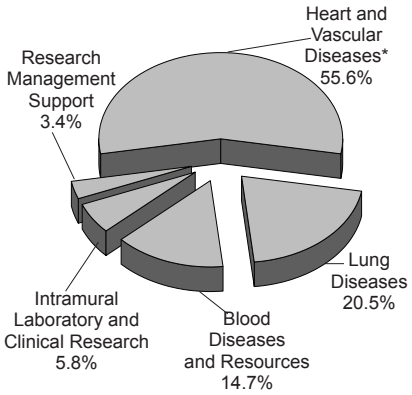
7. Fiscal Year 2007 Budget Overview

NHLBI Obligations by Funding Mechanism: Fiscal Year 2007

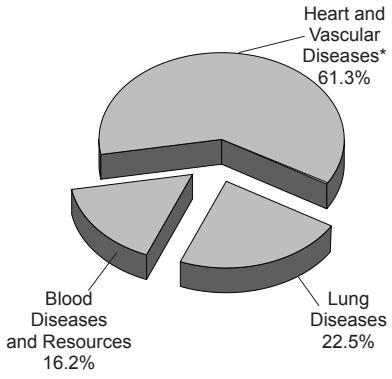
Funding Mechanism	Obligated Dollars* (Thousands)	Percent of Total NHLBI Budget
Research Project Grants**	$1,986,692	68.0%
SCORs/SCCORs	113,903	3.9
Sickle Cell Centers	23,560	0.8
Centers for AIDS Research	3,571	0.1
Other Research Grants	135,284	4.6
Research Careers Programs†	*74,954*	*2.6*
Training Programs	93,316	3.2
Research and Development Contracts	295,842	10.1
Intramural Laboratory and Clinical Research	169,549	5.8
Research Management and Support‡	100,606	3.4
Total Obligations	**$2,922,323**	**100%**

* Excludes funds provided by other Agencies by means of a reimbursable agreement.
** Includes $73,515 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.

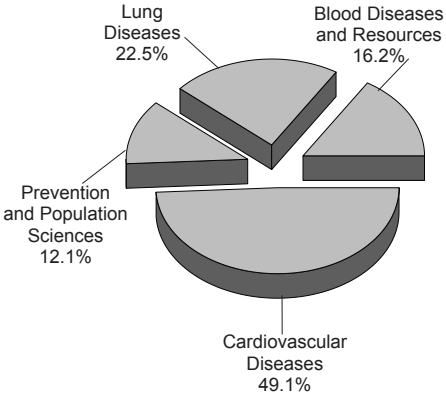
NHLBI Total Obligations by Budget Category



NHLBI Extramural Obligations by Program



NHLBI Extramural Obligations by Division



* Includes Cardiovascular Diseases and Prevention and Population Sciences.

For detailed data on FY 2007:
- 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 2007

Program	Obligated Dollars (Thousands)	Percent of NHLBI Extramural Budget
Heart and Vascular Diseases*	$1,624,819	61.3%
Lung Diseases	597,640	22.5
Blood Diseases and Resources	429,709	16.2
Total, Extramural Obligations	**$2,652,168**	**100%**

* Includes Cardiovascular Diseases and Prevention and Population Sciences.

NHLBI Cardiovascular Diseases Program* Obligations by Funding Mechanism: Fiscal Year 2007

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	$1,026,990	78.8%
SCORs/SCCORs	46,772	3.6
Other Research Grants	42,353	3.3
*Research Career Programs***	*30,374*	*2.3*
Training Programs	45,894	3.5
Research and Development Contracts	140,770	10.8
Total, Cardiovascular Diseases	**$1,302,779**	**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 2007

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	$186,643	58.0%
SCORs/SCCORs	—	—
Other Research Grants	8,990	2.8
*Research Career Programs**	*5,859*	*1.8*
Training Programs	6,972	2.2
Research and Development Contracts	119,435	37.1
Total, Prevention and Population Sciences	**$322,040**	**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 2007

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	$454,866	76.1%
SCORs/SCCORs	47,224	7.9
Other Research Grants	55,029	9.2
*Research Career Programs**	*24,218*	*4.1*
Training Programs	25,330	4.2
Research and Development Contracts	15,915	2.5
Total, Lung Diseases	**$597,640**	**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 2007

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	$318.193	74.0%
SCORs/SCCORs	19,908	4.6
Sickle Cell Centers	23,559	5.5
Centers for AIDS Research	3,571	0.8
Other Research Grants	28,912	6.7
*Research Career Programs**	*14,503*	*3.4*
Training Programs	15,120	3.5
Research and Development Contracts	20,446	4.8
Total, Blood Diseases and Resources	**$429,709**	**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 1950–2007

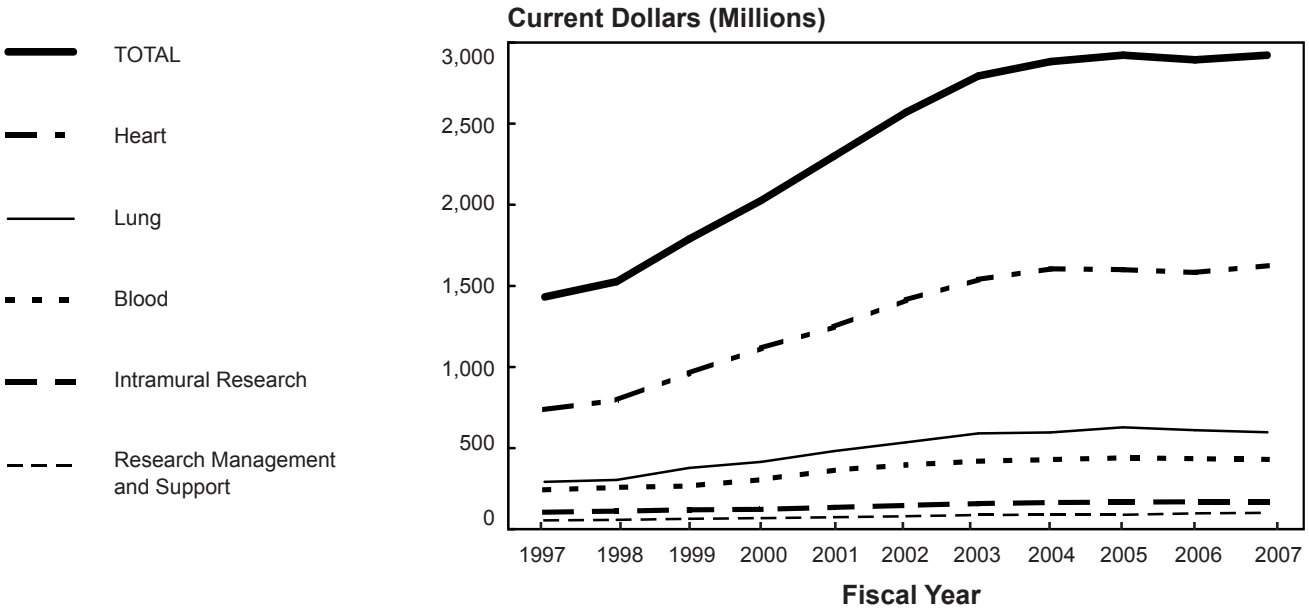
Dollars (Thousands)

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
2007	2,901,012	2,901,012	2,924,299	2,921,757	2,922,322[L]	46,877,854

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 1997–2007

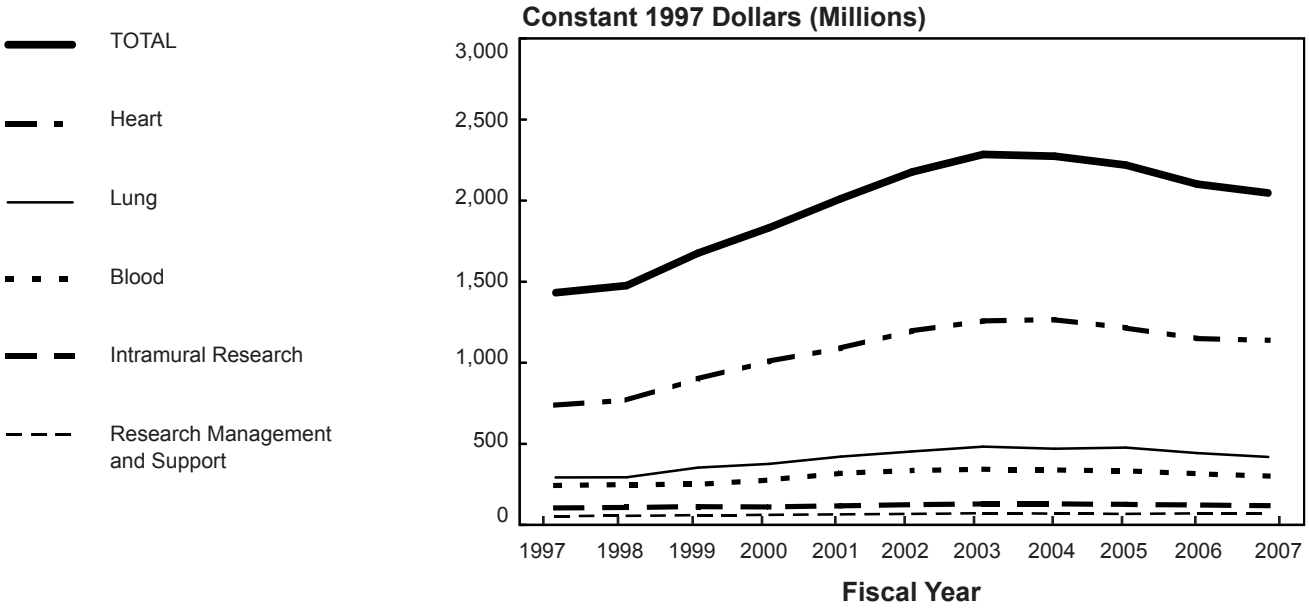
Current Dollars



Note: From 1999 to 2006, the WHI was reported separately. In this chart, it has been incorporated into the "Heart" line. The Sleep Disorders Research was reported separately from 1996 to 2006. In this chart, it has been incorporated into the "Lung" line.

NHLBI Total Obligations by Budget Category: Fiscal Years 1997–2007

Constant 1997 Dollars



Note: From 1999 to 2006, the WHI was reported separately. In this chart, it has been incorporated into the "Heart" line. The Sleep Disorders Research was reported separately from 1996 to 2006. In this chart, it has been incorporated into the "Lung" line.

NHLBI Total Obligations by Budget Category: Fiscal Years 1997–2007

Current Dollars (Millions)

	Fiscal Year										
Budget Category	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Extramural Research											
Heart	$ 737.9	$ 795.6	$ 961.1	$1,115.7	$1,245.8	$1,412.4	$1,538.8	$1,604.7	$1,599.6	$1,582.7	$1,624.9
Lung	292.1	304.0	377.4	415.5	481.0	535.2	590.5	596.0	628.2	610.3	597.6
Blood	242.7	257.5	266.1	305.9	364.0	396.0	419.3	429.2	439.5	434.9	429.7
Intramural Research	104.4	111.6	119.5	122.3	133.7	146.7	157.8	164.2	166.3	168.3	169.5
Research Management and Support	54.6	57.6	63.9	67.9	73.5	79.4	87.3	88.5	89.0	97.2	100.6
Total	**$1,431.7**	**$1,526.3**	**$1,788.0**	**$2,027.3**	**$2,298.0**	**$2,569.7**	**$2,793.7**	**$2,882.6**	**$2,922.6**	**$2,893.4**	**$2,922.3**

Note: From 1999 to 2006, the WHI was reported separately. In this table, it has been incorporated into the "Heart" line. The Sleep Disorders Research was reported separately from 1996 to 2006. In this table, it has been incorporated into the "Lung" line.

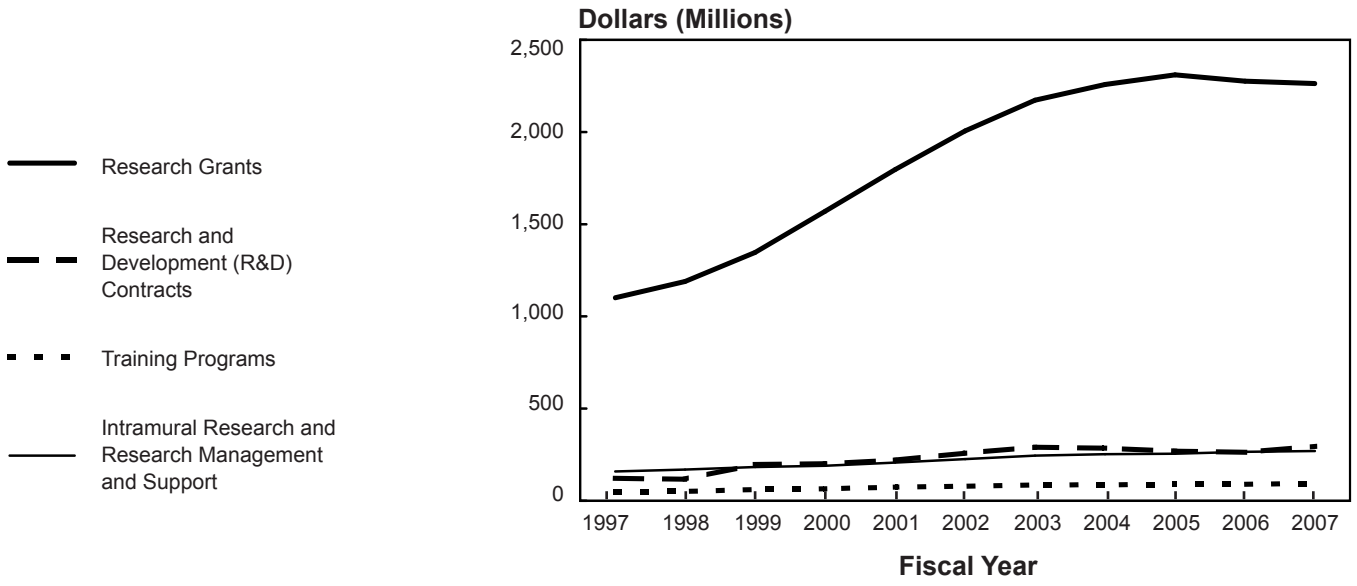
NHLBI Total Obligations by Budget Category: Fiscal Years 1997–2007

Constant 1997 Dollars (Millions)

	Fiscal Year										
Budget Category	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Extramural Research											
Heart	$ 737.9	$ 769.4	$ 900.7	$1,008.8	$1,089.9	$1,195.9	$1,258.2	$1,265.5	$1,214.6	$1,149.4	$1,137.9
Lung	292.1	294.0	353.7	375.7	420.8	453.2	482.8	470.0	477.0	443.2	418.5
Blood	242.7	249.0	249.4	276.6	318.5	335.3	342.8	338.5	333.7	315.9	300.9
Intramural Research	104.4	107.9	112.0	110.6	117.0	124.2	129.0	129.5	126.3	122.2	118.7
Research Management and Support	54.6	55.7	59.9	61.4	64.3	67.2	71.4	69.8	67.6	70.6	70.4
Total	**$1,431.7**	**$1,476.1**	**$1,675.7**	**$1,833.0**	**$2,010.5**	**$2,175.9**	**$2,284.3**	**$2,273.3**	**$2,219.1**	**$2,101.3**	**$2,046.4**

This table is based on the Biomedical Research & Development Price Index through 2007.
Note: From 1999 to 2006, the WHI was reported separately. In this table, it has been incorporated into the "Heart" line. The Sleep Disorders Research was reported separately from 1996 to 2006. In this table, it has been incorporated into the "Lung" line.

NHLBI Total Obligations by Budget Mechanism: Fiscal Years 1997–2007



NHLBI Total Obligations by Budget Mechanism: Fiscal Years 1997–2007

Dollars (Millions)

	Fiscal Year										
Funding Mechanism	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Research Grants*	$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	$2,263.1
Research and Development (R&D) Contracts	121.9	116.7	197.2	201.3	220.1	258.3	290.5	285.5	268.6	262.8	295.8
Training Programs	49.8	50.6	60.8	65.4	73.7	79.2	85.8	87.1	88.4	89.2	93.3
Intramural Research and Research Management and Support**	159.1	169.2	183.4	190.1	207.3	226.1	245.1	252.7	255.4	265.6	270.1
Total	**$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**	**$2,922.3**

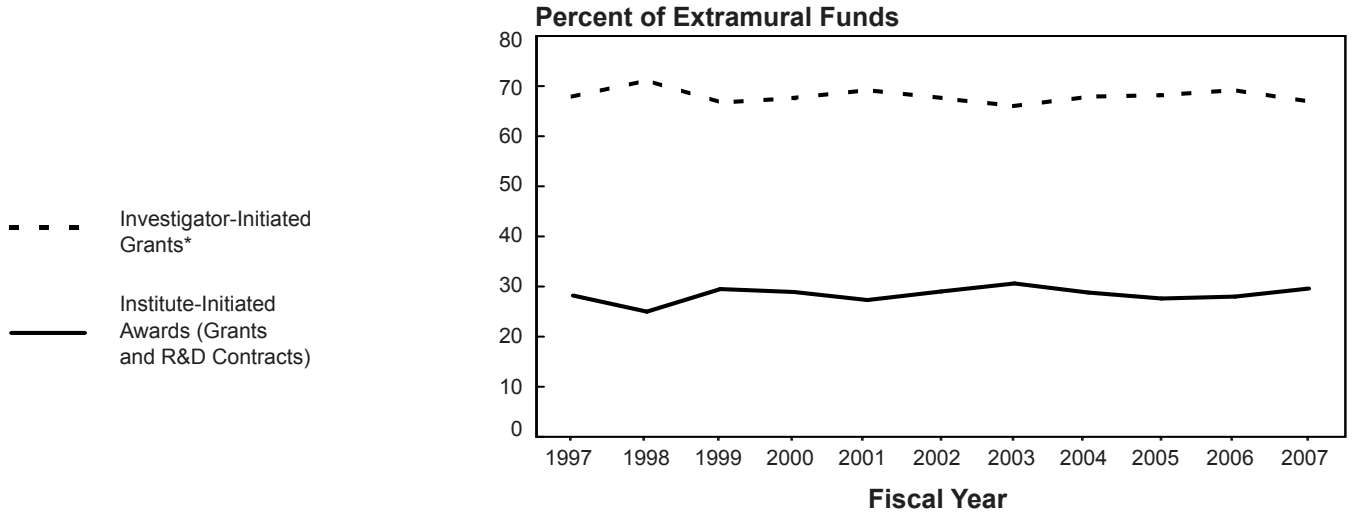
* Includes Research Career Programs.
** Excludes Office of the Director and DIR research contracts, which are included in R&D contracts.

NHLBI Employment: Fiscal Years 1997–2007

	Fiscal Year										
Staff	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
FTEs*	829	840	847	865	868	880	880	861	796	797	814

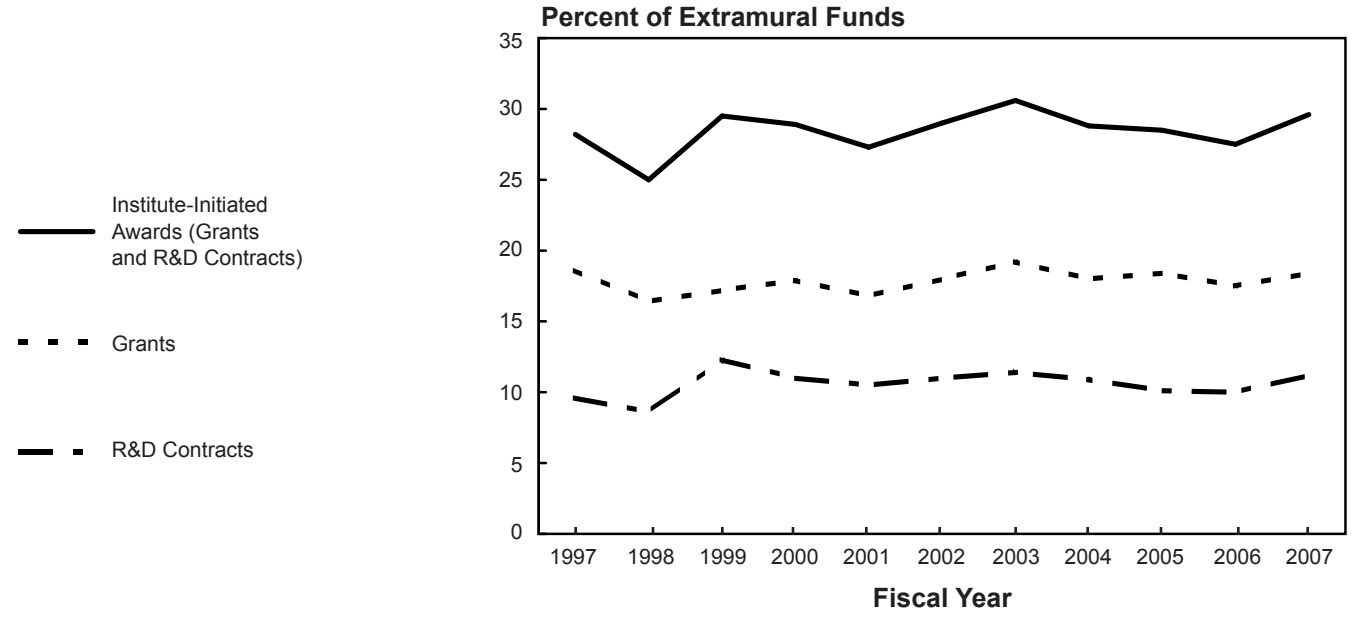
* Full-time equivalents.

NHLBI Institute-Initiated and Investigator-Initiated Awards: Fiscal Years 1997–2007



* Includes Research Career Programs.

NHLBI Grants and Research and Development Contracts as Subsets of Institute-Initiated Awards: Fiscal Years 1997–2007



NHLBI Extramural Programs: Fiscal Years 1997–2007

Dollars (Millions)

	Fiscal Year										
Funding Mechanism	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Investigator-Initiated Awards											
Investigator-Initiated Grants*	$ 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	$1,719.3
Research Career Programs	33.9	36.1	47.7	54.2	57.5	63.5	65.8	67.8	71.0	70.4	55.4
Subtotal, Investigator-Initiated Awards	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	1,774.7
Institute-Initiated Awards											
Institute-Initiated Grants (RFA)	236.8	223.2	276.7	328.9	350.7	421.3	490.4	472.5	492.1	458.6	488.2
*Centers***	*108.7*	*114.4*	*119.9*	*123.8*	*127.2*	*128.2*	*138.9*	*140.6*	*151.5*	*141.1*	*141.0*
R&D Contracts (RFP)	121.9	116.7	197.2	201.3	220.1	258.3	290.5	285.5	268.6	262.9	295.8
Subtotal, Institute-Initiated Awards	358.7	339.9	473.9	530.2	570.8	679.6	780.9	758.0	760.7	721.4	784.0
Training											
Individual Awards	6.8	7.6	9.2	8.9	8.9	9.5	8.6	8.8	9.7	10.0	8.2
Institutional Awards	43.0	43.0	51.6	56.5	64.8	69.7	77.2	78.4	78.7	79.1	85.1
Subtotal, Training	49.8	50.6	60.8	65.4	73.7	79.2	85.8	87.2	88.4	89.2	93.3
Total, Extramural	**$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**	**$2,652.0**

* 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.

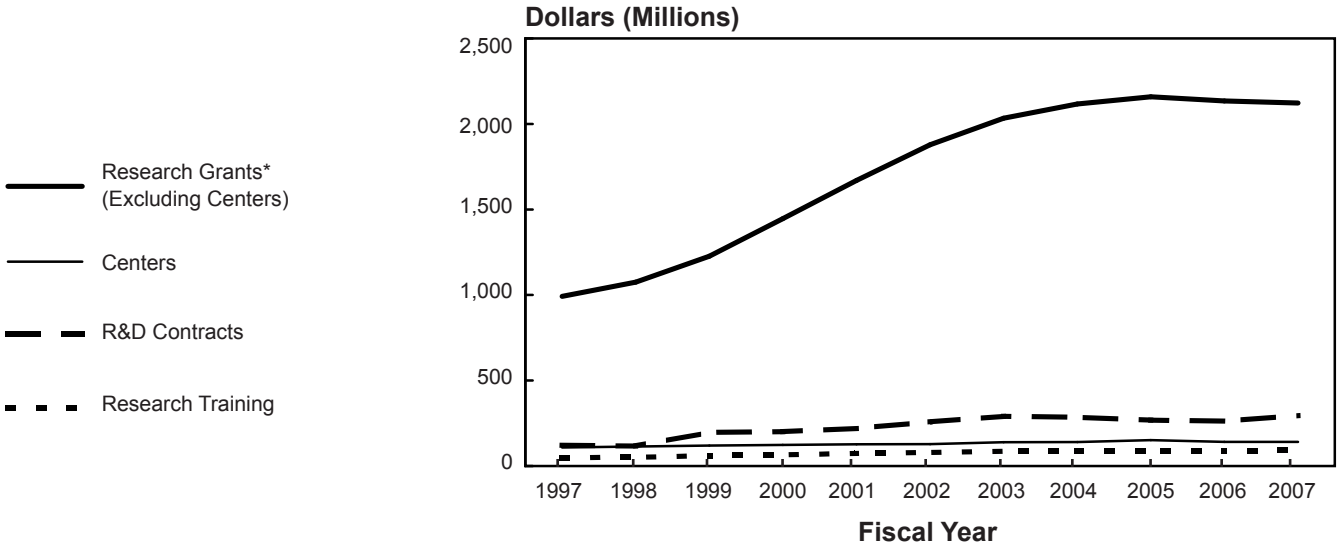
NHLBI Extramural Programs: Fiscal Years 1997–2007

Percent of Total Extramural Budget

	Fiscal Year										
Funding Mechanism	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Investigator-Initiated Awards											
Investigator-Initiated Grants*	65.2%	68.6%	63.7%	64.6%	66.4%	64.9%	63.4%	65.3%	65.5%	66.5%	64.8%
Research Career Programs (K04, K06)	2.7	2.7	3.0	3.0	2.8	2.7	2.6	2.6	2.7	2.7	2.1
Subtotal, Investigator-Initiated Awards	67.9	71.2	66.7	67.6	69.2	67.6	66.0	67.9	68.2	69.2	66.9
Institute-Initiated Awards											
Institute-Initiated Grants (RFA)	18.6	16.4	17.2	17.9	16.8	18.0	19.2	18.0	18.4	17.5	18.4
*Centers***	*8.5*	*8.4*	*7.5*	*6.7*	*6.1*	*5.5*	*5.5*	*5.3*	*5.7*	*5.4*	*5.3*
R&D Contracts (RFP)	9.6	8.6	12.3	11.0	10.5	11.0	11.4	10.9	10.1	10.0	11.2
Subtotal, Institute-Initiated Awards	28.2	25.0	29.5	28.9	27.3	29.0	30.6	28.8	28.5	27.5	29.6
Training											
Individual Awards	0.5	0.6	0.6	0.5	0.4	0.4	0.3	0.3	0.4	0.4	0.3
Institutional Awards	3.4	3.2	3.2	3.1	3.1	3.0	3.0	3.0	3.0	3.0	3.2
Subtotal, Training	3.9	3.7	3.8	3.6	3.5	3.4	3.4	3.3	3.3	3.4	3.5
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 1997–2007



* Includes Research Career Programs; does not include Centers.

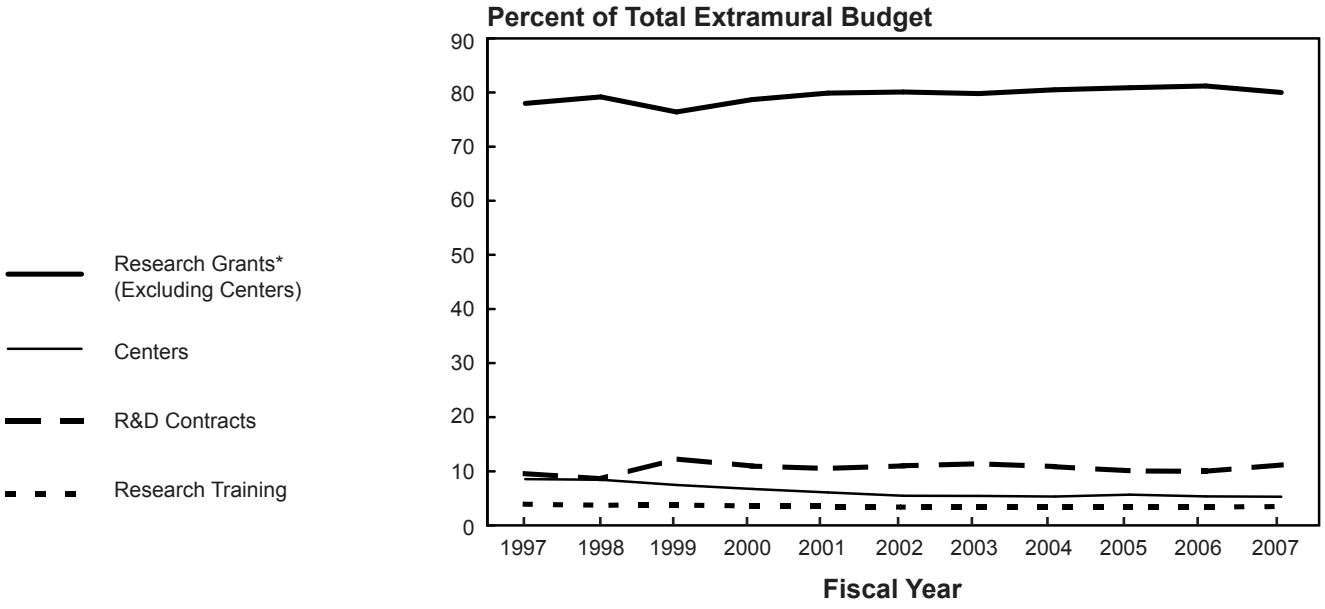
NHLBI Extramural Research Funding Mechanism: Fiscal Years 1997–2007

Dollars (Millions)

	Fiscal Year										
Funding Mechanism	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Research Grants*	$ 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	$2,121.9
Centers	108.7	114.4	119.9	123.8	127.2	128.2	138.9	140.6	151.5	141.1	141.0
R&D Contracts	121.9	116.7	197.2	201.3	220.1	258.3	290.5	285.5	268.6	262.9	295.8
Research Training	49.8	50.6	60.8	65.4	73.7	79.2	85.8	87.1	88.4	89.2	93.3
Total, Extramural	**$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**	**$2,652.0**

* Includes Research Career Programs; does not include Centers.

NHLBI Extramural Research Funding Mechanism: Fiscal Years 1997–2007



* Includes Research Career Programs; does not include Centers.

NHLBI Extramural Research Funding Mechanism: Fiscal Years 1997–2007

Percent of Total Extramural Budget

	Fiscal Year										
Funding Mechanism	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Research Grants*	78.0%	79.2%	76.4%	78.7%	79.9%	80.1%	79.8%	80.5%	80.9%	81.2%	80.0%
Centers	8.5	8.4	7.5	6.7	6.1	5.5	5.5	5.3	5.7	5.4	5.3
R&D Contracts (RFP)	9.6	8.6	12.3	11.0	10.5	11.0	11.4	10.9	10.1	10.0	11.2
Research Training	3.9	3.7	3.8	3.6	3.5	3.4	3.4	3.3	3.3	3.4	3.5
Total, Extramural	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

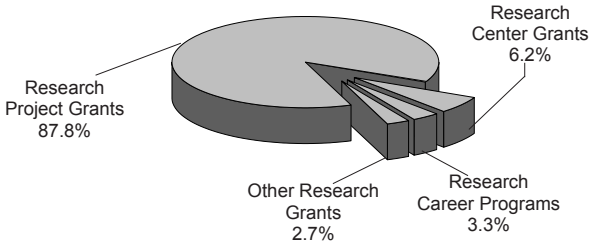
* Includes Research Career Programs; does not include Centers.
Note: Numbers may not add to total due to rounding.

9. Research Grants

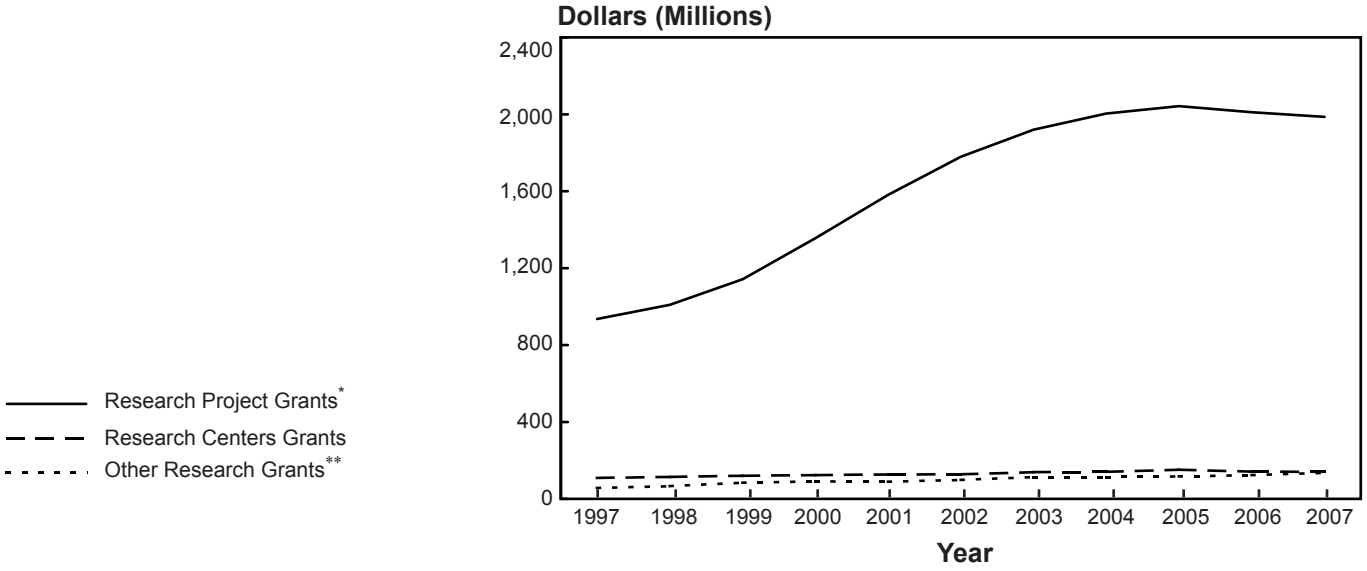
NHLBI Research Grants by Funding Mechanism: Fiscal Year 2007

	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)	3,121	$1,294,558	57.21%
Program Project Grants (P01)	169	340,031	15.03
Cooperative Agreements (U01)	226	200,402	8.86
Area Grants (R15)	18	3,881	0.17
Explorative Developmental Grant (R21)	151	30,532	1.35
Exploratory/Developmental Grants Phase II (R33)	22	6,949	0.31
Method to Extend Research in Time (R37)	77	32,199	1.42
NIH Director's Pioneer Award (DP2)	1	2,625	0.12
Cooperative Agreements (U19)	1	2,000	0.09
Subtotal, Research Project Grants (Excluding Small Business RPGs)	3,786	1,913,177	84.54
Small Business Research Project Grants			
Small Business Technology Transfer (STTR Phase I) (R41)	9	1,606	0.07
Small Business Technology Transfer (STTR Phase II) (R42)	16	6,983	0.31
Small Business Innovation Research (SBIR Phase I) (R43)	59	9,950	0.44
Small Business Innovation Research (SBIR Phase II) (R44)	90	54,976	2.43
Subtotal, Small Business Research Project Grants	174	73,515	3.25
Subtotal, Research Project Grants	3,960	1,986,692	87.80
Research Center Grants			
Specialized Centers of Research (SCOR) (P50)	39	104,961	4.64
Sickle Cell Centers (U54)	11	23,559	1.04
Center for AIDS Research (P30)	—	3,571	0.16
Specialized Centers (Cooperative Agreements) (U54)	5	8,523	0.38
National Swine Research and Resource Center (U42)	—	420	0.02
Subtotal, Research Center Grants	55	141,034	6.23
Research Career Programs			
Mentored Research Development Award for Minority Faculty (K01)	35	4,718	0.21
Minority Institution Faculty Mentored Research Scientist Award (K01)	5	698	0.03
Mentored Scientist Development Award in Research Ethics (K01)	3	357	0.02
Independent Scientist Award (K02)	25	2,511	0.11
Pediatric Transfusion Medicine Academic Award (K07)	4	486	0.02
Cultural Competence and Health Disparities Academic Award (K07)	18	2,232	0.10
Clinical Investigator Scientist Award (K08)	214	27,286	1.21
Vascular Medicine Research Career Development Program (K12)	7	3,206	0.14
Clinical Hematology Research Career Development Program (K12)	6	2,367	0.10
Genetics and Genomics of Lung Disease Career Development Program (K12)	8	3,154	0.14
Career Enhancement Award for Stem Cell Research (K18)	4	652	0.03
Mentored Patient-Oriented Research Career Development Award (K23)	120	16,419	0.73
Midcareer Investigator Award in Patient-Oriented Research (K24)	29	4,037	0.18
Mentored Quantitative Research Career Development Award (K25)	15	2,077	0.09
Clinical Research Curriculum Award (K30)	16	2,520	0.11
Career Transition Award (K22)	1	160	0.01
Career Transition Award (K99)	24	2,074	0.09
Subtotal, Research Career Programs	534	74,954	3.32
Other Research Grants			
Cooperative Clinical Research (U10, R10)	48	36,622	1.62
Minority Biomedical Research Support (S06, R25, SC2)	3	2,474	0.11
Other (R09, R13, R18, R24, R25, T15, U09, U24, UH1)	100	21,234	0.94
Subtotal, Other Research Grants	151	60,330	2.67
Total, NHLBI Research Grants	**4,700**	**$2,263,010**	**100%**

NHLBI Total Research Grants by Category



NHLBI Research Project Grant,* Research Centers Grant, and Other Research Grant Obligations: Fiscal Years 1997–2007



* Includes R01, U01, P01, R03, R15, R21, R29, R37, R41, R42, R43, and R44; R33 beginning in 2001; and DP2 and U19 in 2007.
** Includes Research Career Programs; excludes General Research Support Grants.

NHLBI Research Project Grants,* Research Centers Grants, and Other Research Grant Obligations: Fiscal Years 1997–2007

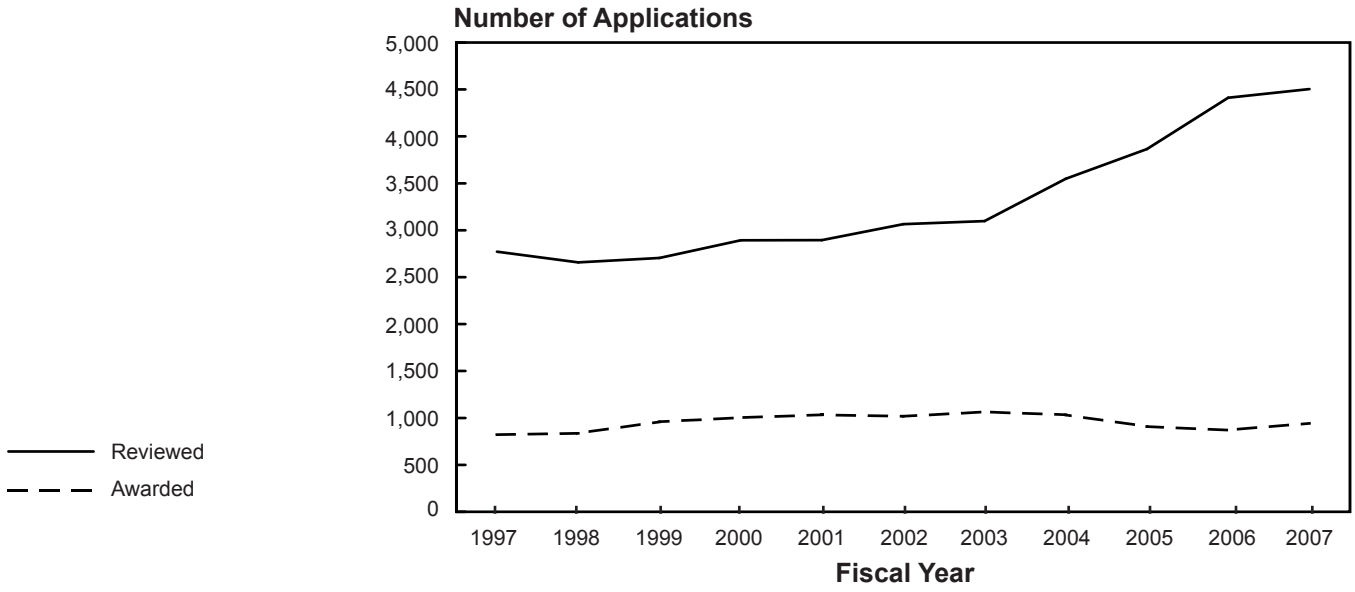
Dollars (Thousands)

	Fiscal Year										
	1997	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Research Project Grants*	$ 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	$1,986,692
Research Centers Grants	108,665	114,397	119,889	123,803	127,232	128,161	138,941	140,600	151,495	141,086	141,034
Other Research Grants**	56,993	66,234	84,219	90,666	88,958	98,460	113,172	112,785	116,713	123,802	135,284
Total	**$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**	**$2,263,010**

* Includes R01, U01, P01, R03, R15, R21, R29, R37, R41, R42, R43, and R44; R33 beginning in 2001; and DP2 and U19 in 2007.
** Includes Research Career Programs; excludes General Research Support Grants.

NHLBI Competing Research Project Grant Applications:* Fiscal Years 1997–2007

Number Reviewed and Awarded

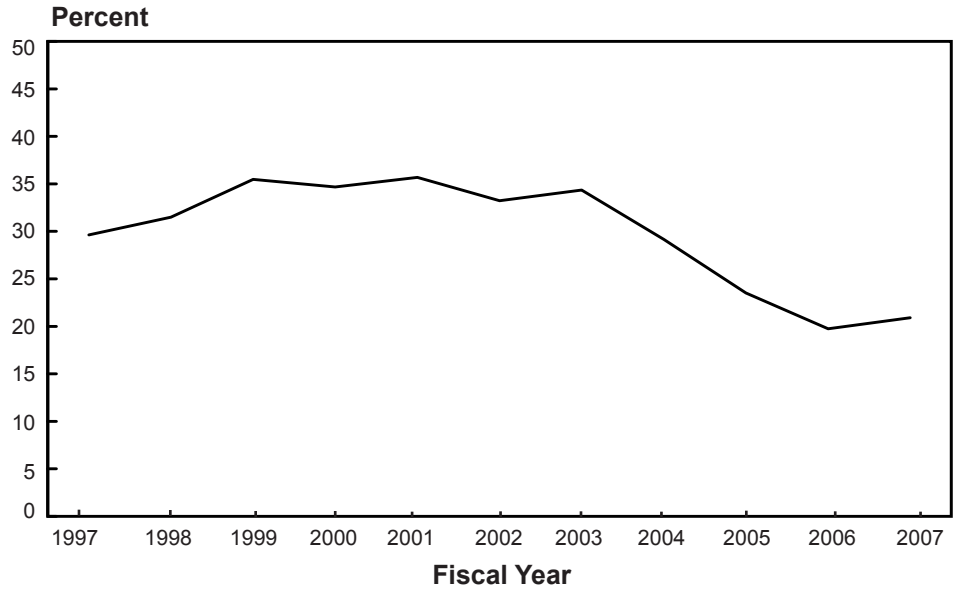


Number Reviewed and Awarded and Percent Funded

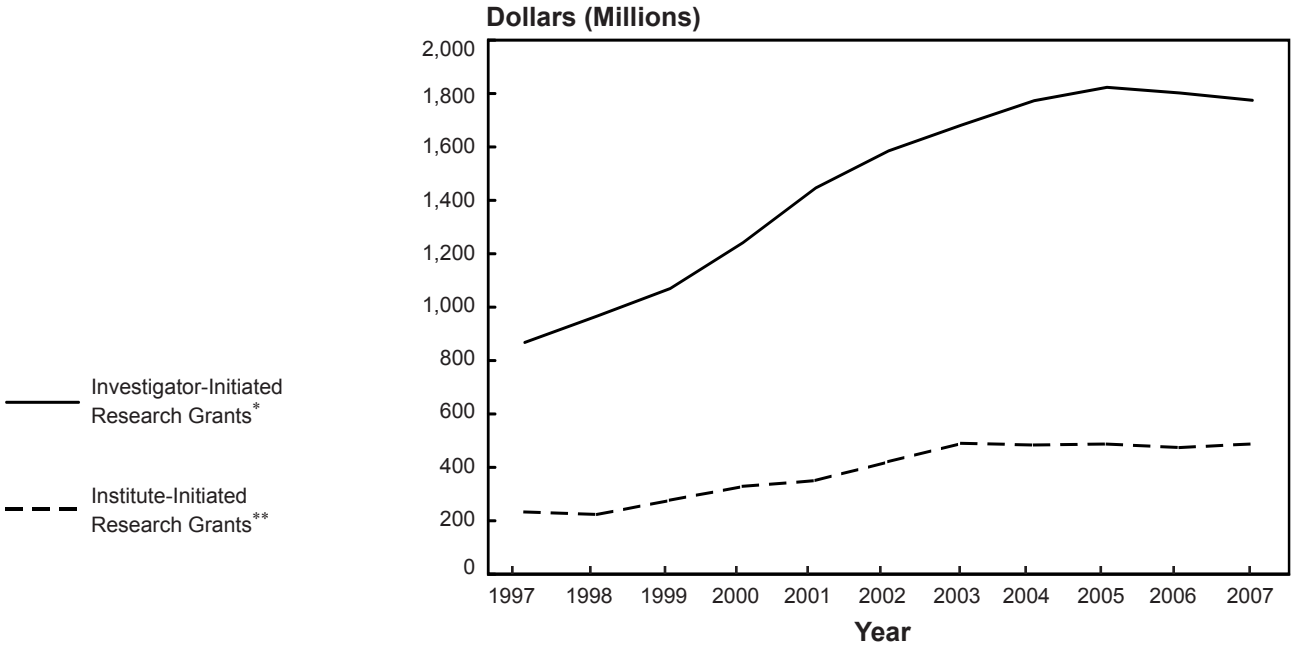
	Fiscal Year										
	1997	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Applications Reviewed	2,771	2,657	2,704	2,893	2,895	3,064	3,098	3,548	3,865	4,412	4,504
RPGs Awarded	821	837	959	1,003	1,033	1,018	1,064	1,034	909	871	943
Success Rate (percent)	29.6	31.5	35.5	34.7	35.7	33.2	34.3	29.1	23.5	19.7	20.9

* Includes R01, U01, P01, R03, R15, R21, R29, and R37; R33 beginning in 2001; and DP2 and U19 beginning in 2007.

Percent of Reviewed Applications Funded (Success Rate)



NHLBI Investigator-Initiated and Institute-Initiated Grant Obligations: Fiscal Years 1997–2007



* Includes RPGs, SBIRs/STTRs, Research Career Programs, and Other Research.
** Includes RPGs, Centers Grants, Research Career Programs, Other Research, and Cooperative Agreement RFAs.

NHLBI Investigator-Initiated and Institute-Initiated Grant Obligations: Fiscal Years 1997–2007

Dollars (Millions)

	Fiscal Year										
	1997	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Investigator-Initiated*	$ 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	$1,774.8
Institute-Initiated**	233.0	223.2	276.7	328.9	350.7	421.3	490.4	483.8	487.3	473.8	488.2
Total	**$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**	**$2,263.0**

* Includes RPGs, SBIRs/STTRs, Research Career Programs, and Other Research.
** Includes RPGs, Centers Grants, Research Career Programs, Other Research, and Cooperative Agreement RFAs.

NHLBI Research Project Grants:* Amount Funded by Type of Award, Fiscal Years 1997–2007

Dollars (Millions)

	Fiscal Year										
	1997	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Competing											
New Competing	$135.8	$147.5	$ 202.0	$ 266.4	$ 280.0	$ 291.2	$ 285.5	$ 290.5	$ 270.0	$ 242.9	$ 330.9
Renewal Competing	104	103.9	127.2	152	143.9	143.9	177.2	185.5	176.1	168.3	169.4
Competing Supplements	0.3	1	1.2	0.9	0.4	2.3	1	1.3	1.7	0.4	—
Subtotal, Competing	240.1	252.4	330.4	419.3	424.3	437.4	463.7	477.3	447.8	411.6	500.3
Noncompeting											
Subtotal, Noncompeting	662.4	721.3	770.6	889.3	1,101.5	1,281.3	1,390.3	1454.9	1,520.0	1,527.0	1,486.4
Total, Competing and Noncompeting	**$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**	**$1,986.7**

* Includes R01, U01, P01, R03, R15, R21, R29, R37, R41, R42, R43, and R44; R33 beginning in 2001; and DP2 and U19 beginning in 2007.

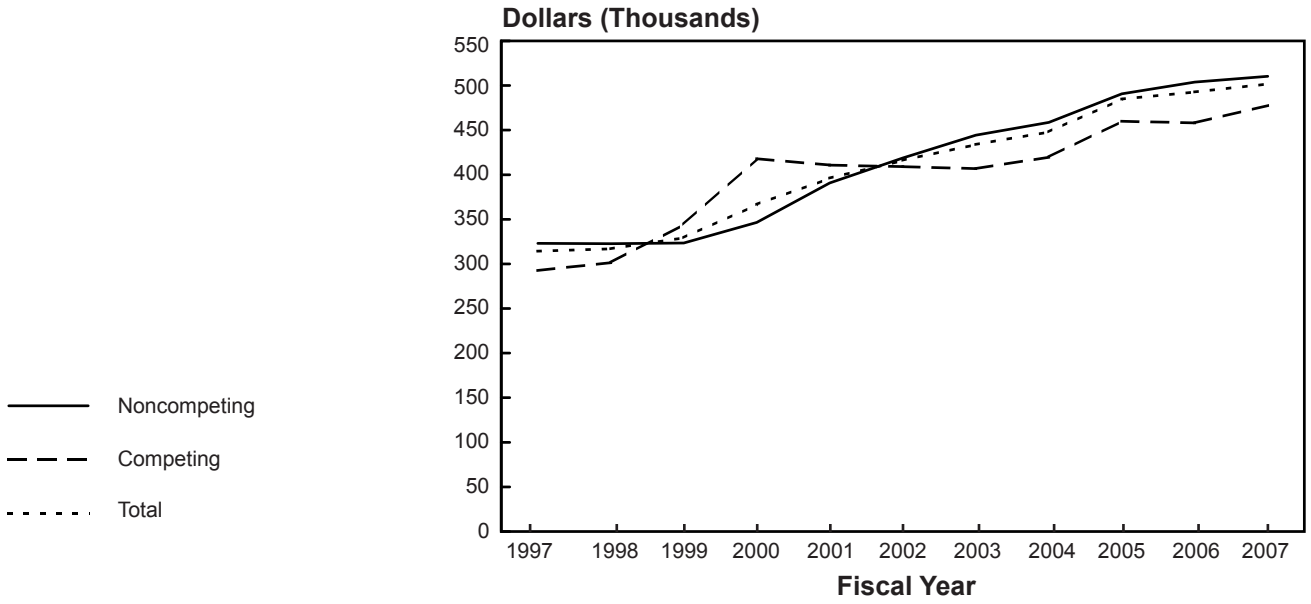
Facility and Administrative (F&A) Costs of NHLBI Research Project Grants:* Fiscal Years 1997–2007

Dollars (Thousands)

Fiscal Year	Direct Cost	F&A Cost	Total Cost	F&A Cost as a Percent of Direct Cost
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
2007	1,378,134	608,558	1,986,692	44.2

* Includes R01, U01, P01, R03, R15, R21, R29, R37, R41, R42, R43, and R44; R33 beginning in 2001; and DP2 and U19 beginning in 2007.
** Excludes Program Evaluation Assessment of $1,216,000.

NHLBI Research Project Grants:* Average Costs, Fiscal Years 1997–2007



* Includes R01, U01, P01, R03, R15, R21, R29, R37, R41, R42, R43, and R44; R33 beginning in 2001; and DP2 and U19 beginning in 2007.

NHLBI Research Project Grants:* Average Costs, Fiscal Years 1997–2007

Dollars (Thousands)

	Fiscal Year										
	1997	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Noncompeting	$323.0	$322.6	$323.4	$346.6	$390.7	$418.8	$444.4	$458.7	$490.6	$503.9	$510.3
Competing	292.5	301.6	344.5	418.0	410.8	409.1	406.7	419.7	459.9	458.1	477.8
Total	**$314.2**	**$316.9**	**$329.4**	**$366.6**	**$396.1**	**$416.2**	**$433.8**	**$447.9**	**$484.8**	**$492.8**	**$501.7**

* Includes R01, U01, P01, R03, R15, R21, R29, R37, R41, R42, R43, and R44; R33 beginning in 2001; and DP2 and U19 beginning in 2007.

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 2007	Total FY 2007 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
AIM HIGH: Niacin Plus Statin to Prevent Vascular Events	$ 6,987,287	$ 6,018,096	$ 13,005,383
Atherosclerosis, Plaque, and CVD in Communities	13,259,110	2,885,489	16,144,599
Bypass Angioplasty Revascularization Investigation in Type 2 Diabetics (BARI 2D)	52,450,028	2,646,947	55,096,975
Cardiovascular Cell Therapy Research Network	—	4,424,183	4,424,183
Cardiovascular Heart Study (CHS) Events Follow-up Study	2,062,679	1,145,576	3,208,255
Cardiovascular Outcomes in Renal Atherosclerotic Lesions (CORAL)	14,837,498	3,306,675	18,144,173
Claudication Exercise vs. Edoluminal Revascularization	2,846,994	1,898,415	4,745,409
Clinical Research Consortium To Improve Resuscitation Outcomes	25,408,658	8,971,584	34,380,242
Community-Responsive Intervention To Reduce Cardiovascular Risk in American Indians and Alaska Natives	1,418,746	2,314,003	3,732,749
Design and Analysis of Genome-Wide Association Studies	1,780,137	1,758,776	3,538,913
Dynamic Evaluation of Percutaneous Coronary Intervention	6,180,419	—	6,180,419
Family Blood Pressure Program	93,226,792	3,716,949	96,943,741
Genetics of Coronary Artery Disease in Alaska Natives (GOCADAN)	11,838,340	2,029,384	13,867,724
Girls Health Enrichment Multisite Studies (GEMS)	19,418,195	—	19,418,195
Heart Failure: A Controlled Trial Investigating Outcomes of Exercise Training (HF–ACTION)	34,118,122	2,846,477	36,964,599
Heart Failure Clinical Research Network	5,642,461	7,800,582	13,443,043
Home Automatic External Defibrillator Trial (HAT)	17,178,972	—	17,178,972
IMMEDIATE Trial: Immediate Myocardial Metabolic Enhancement During Initial Assessment and Treatment in Emergency Care	25,650,639	—	25,650,639
Improved Measures of Diet and Physical Activity for the Genes and Environment Initiative	—	2,632,681	2,632,681
Network for Cardiothoracic Surgical Investigation in Cardiovascular Medicine	—	6,008,848	6,008,848
NHLBI Clinical Proteomics Program	10,024,329	4,920,952	14,945,281
Occluded Artery Trial (OAT)	17,224,514	1,452,378	18,676,892
Partnership Programs for Reducing Cardiovascular Health Disparities	20,929,126	7,330,477	28,259,603
Pediatric Heart Network	29,578,646	6,607,550	36,186,196
Pharmacogenetics Research Network	48,524,584	8,770,916	57,295,500
Preventing Overweight Using Novel Dietary Strategies (POUNDS LOST)	6,779,823	—	6,779,823
Programs in Gene by Environment Interaction (PROGENI)	46,713,444	1,459,246	48,172,690
Programs of Excellence in Nanotechnology	17,553,560	10,992,900	28,546,460
Programs of Genomic Applications (PGAs) for Heart, Lung, and Blood Diseases	195,107,611	14,039,424	209,147,035
Stop Atherosclerosis in Native Diabetics Study (SANDS)	11,079,036	197,305	11,276,341
Strong Heart Study	57,974,143	6,182,306	64,156,449
Surgical Treatment for Ischemic Heart Failure (STICH)	25,529,882	8,912,357	34,442,239
Trial of Activity for Adolescent Girls (TAAG)	34,211,102	—	34,211,102
Weight Loss in Obese Adults with Cardiovascular Risk Factors: Clinical Interventions	2,567,146	3,713,946	2,567,146
Weight Loss Maintenance (WLM)	15,168,042	2,150,858	17,318,900
Subtotal, Heart and Vascular Diseases	873,270,065	137,135,280	1,006,691,399

	Total Obligations Prior to FY 2007	Total FY 2007 Obligations	Total Obligations to Date
Lung Diseases			
Apnea Positive Pressure Long-Term Efficacy Study (APPLES)	12,542,181	1,532,037	14,074,218
Asthma Clinical Research Network (ACRN), Phase II	33,110,894	8,917,879	42,028,773
Centers for Reducing Asthma Disparities	27,350,819	—	27,350,819
Childhood Asthma Management Program–Continuation Study (CAMP-CS)/Phase III	—	2,077,278	2,077,278
Childhood Asthma Research and Education (CARE) Network	42,837,293	5,915,840	48,753,133
Clinical Trial of Acid Reflux Therapy in Asthma	3,083,552	662,283	3,745,835
Collaborative Programs in Bronchopulmonary Dysplasia	36,731,072	2,526,747	39,257,819
COPD Clinical Research Network	29,793,928	6,836,458	36,630,386
Early Antipseudomonal Therapy in Cystic Fibrosis	3,145,273	923,625	4,068,898
Genetic Epidemiology of COPD	—	6,113,536	6,113,536
Idiopathic Pulmonary Fibrosis Clinical Research Network	10,835,422	7,216,255	18,051,677
Pharmacogenetics of Asthma Treatment	17,494,738	3,190,981	20,685,719
Prospective Investigation of Pulmonary Embolism Diagnosis-III (PIOPED III)	6,643,681	1,518,303	8,161,984
Randomized Controlled Study of Adenotonsillectomy for Childhood Sleep Apnea	2,267,140	2,387,691	4,654,831
Sleep Heart Health Study	20,511,241	625,846	21,137,087
Study of Acid Reflux Therapy for Children with Asthma	774,454	846,333	1,620,787
Subtotal, Lung Diseases	247,121,688	51,291,092	298,412,780
Blood Diseases and Resources			
Blood and Marrow Transplant Clinical Research Network	36,486,721	6,708,880	43,195,601
Center for Human Cell Therapy	7,281,374	2,096,324	9,377,698
Functional Outcomes in Cardiovascular Patients Undergoing Surgical Hip Fracture Repair (FOCUS)	8,804,219	1,974,477	10,778,696
Sickle Cell Clinical Research Network	3,761,385	7,497,847	11,259,232
Stroke with Transfusions Changing to Hydroxyurea (SWITCH)	7,277,340	3,531,426	10,808,766
Thalassemia (Cooley's Anemia) Clinical Research Network	16,787,170	2,618,369	19,405,539
Transfusion Medicine/Hemostasis Clinical Research Network	31,128,254	6,407,000	37,535,254
Subtotal, Blood Diseases and Resources	111,526,463	30,834,323	142,360,786
Total, NHLBI Cooperative Agreements	**$1,231,918,216**	**$219,260,695**	**$1,447,464,965**

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 from minority populations.

Obligations

Funding History:
Fiscal Year 2007—$6,018,096
Fiscal Years 2005–2006— $6,987,287
Total Funding to Date—$13,005,383

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 2007—$2,885,489
Fiscal Years 2004–2006—$13,259,110
Total Funding to Date—$16,144,599

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 patients with type 2 diabetes 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 such as metformin and the glitazones for controlling blood sugar level offer any survival advantage over drugs that increase insulin level. Twenty-one percent of the patients are from minority populations.

Obligations

Funding History:
Fiscal Year 2007—$2,646,947
Fiscal Years 2000–2006—$52,450,028
Total Funding to Date—$55,096,975

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 Cell Therapy Research Network, Initiated in Fiscal Year 2007

See Chapter 11. Clinical Trials.

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 2007—$1,145,576
Fiscal Years 2005–2006—$2,062,679
Total Funding to Date—$3,208,255

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. Twenty-three percent of the participants will be from minority populations.

Obligations

Funding History:
Fiscal Year 2007—$3,306,675
Fiscal Years 2004–2006—$14,837,498
Total Funding to Date—$18,144,173

Current Active Organizations and Grant Numbers

1. University of Toledo Health Sciences Campus
Toledo, Ohio —HL-071556
2. University of Minnesota, Twin Cities
Minneapolis, Minnesota —HL-072734
3. University of Virginia
Charlottesville, Virginia —HL-072735
4. Mid-America Heart Institute of St. Luke Hospital
Kansas City, Missouri —HL-072736
5. Beth Israel Deaconess Medical Center
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 2007—$1,898,415
Fiscal Years 2005–2006—$2,846,994
Total Funding to Date—$4,745,409

Current Active Organizations and Grant Numbers

1. Rhode Island Hospital
Providence, Rhode Island —HL-077221
2. Beth Israel Deaconess Medical Center
Boston, Massachusetts —HL-081656

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

See Chapter 11. Clinical Trials.

Community-Responsive Intervention To Reduce Cardiovascular Risk in American Indians and Alaska Natives, Initiated in Fiscal Year 2006

See Chapter 11. Clinical Trials.

Design and Analysis of Genome-Wide Association Studies, Initiated in Fiscal Year 2006

The purpose of this program is to develop and test innovative, informative, and cost-effective study designs and analytical strategies to perform genome-wide association studies on complex diseases. Strategies and tools developed through the program will be made available to the scientific community.

Obligations

Funding History:
Fiscal Year 2007—$1,758,776
Fiscal Year 2006—$1,780,137
Total Funding to Date—$3,538,913

Current Active Organizations and Grant Numbers

1. University of Chicago
Chicago, Illinois —HL-084689
2. Cornell University Ithaca
Ithaca, New York —HL-084706
3. University of Chicago
Chicago, Illinois —HL-084715

4. University of Michigan at Ann Arbor
   Ann Arbor, Michigan —HL-084729
5. University of Maryland, Baltimore
   Baltimore, Maryland —HL-084756
6. Translational Genomics Research Institute
   Phoenix, Arizona —HL-086528

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 2007—$0
Fiscal Years 1997–2006—$6,180,419
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 2007—$3,716,949
Fiscal Years 1995–2006—$93,226,792
Total Funding to Date—$96,943,741

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 2007—$2,029,384
Fiscal Years 2000–2006—$11,838,340
Total Funding to Date—$13,867,724

Current Active Organizations and Grant Numbers

1. MedStar Research Institute
   Hyattsville, Maryland —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 2007—$0
Fiscal Years 1999–2006—$19,418,195
Total Funding to Date—$19,418,195

Current Active Organizations and Grant Numbers

1. St. Jude Children's Research Hospital
   Memphis, Tennessee —HL-062662
2. Stanford University
   Stanford, California —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. Thirty-eight percent of the participants are from minority populations.

Obligations

Funding History:
Fiscal Year 2007—$2,846,477
Fiscal Years 2002–2006—$34,118,122
Total Funding to Date—$36,964,599

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
    Philadelphia, Pennsylvania —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

See Chapter 11. Clinical Trials.

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 2007—$0
Fiscal Years 2002–2006—$17,178,972
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 2007—$0
Fiscal Years 2004–2006—$25,650,639
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

Improved Measures of Diet and Physical Activity for the Genes and Environment, Initiated in Fiscal Year 2007

The purpose of this program is to support the development of technology to make precise, quantitative measurements of personal exposure to environmental chemical or biological agents, diet, physical activity, and psychosocial stress.

Obligations

Funding History:
Fiscal Year 2007—$2,632,681
Total Funding to Date—$2,632,681

Current Active Organizations and Grant Numbers

1. University of Pittsburgh
   Pittsburgh, Pennsylvania —HL-091736
2. Massachusetts Institute of Technology
   Cambridge, Massachusetts —HL-091737
3. Princeton Multimedia Technologies Corporation
   Princeton, New Jersey —HL-091738

Network for Cardiothoracic Surgical Investigation in Cardiovascular Medicine, Initiated in Fiscal Year 2007

See Chapter 11. Clinical Trials.

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 2007—$4,920,952
Fiscal Years 2005–2006—$10,024,329
Total Funding to Date—$14,945,281

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. Massachusetts General Hospital
   Boston, Massachusetts —HL-081341

Occluded Artery Trial (OAT), Initiated in Fiscal Year 1999

The purpose of this study is to determine whether percutaneous revascularization to open an occluded artery within a few days or as long as a month following an acute MI in asymptomatic patients improves their outcome. Although the benefits of early restoration of blood flow following an acute MI have been well-established, it is not known whether later intervention is also beneficial. The trial is in its follow-up phase.

Funding History:
Fiscal Year 2007—$1,452,378
Fiscal Years 1999–2006—$17,224,514
Total Funding to Date—$18,676,892

Current Active Organizations and Grant Numbers

1. New York University School of Medicine
   New York, New York —HL-062509
2. Maryland Medical Research Institute, Inc
   Baltimore, Maryland —HL-062511

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 2007—$7,330,477
Fiscal Years 2004–2006—$20,929,126
Total Funding to Date—$28,259,603

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 38 percent minority participation.

Obligations

Funding History:
Fiscal Year 2007—$8,770,916
Fiscal Years 2001–2006—$48,524,584
Total Funding to Date—$57,295,500

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). Seventeen percent of the participants are from minority populations.

Obligations

Funding History:
Fiscal Year 2007—$0
Fiscal Years 2003–2006—$6,779,823
Total Funding to Date—$6,779,823

Current Active Organization and Grant Number

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

Programs in Gene by Environmental Interaction (PROGENI), 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 black 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 2007—$1,459,246
Fiscal Years 2002–2006—$46,713,444
Total Funding to Date—$48,172,690

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 Alabama at Birmingham
   Birmingham, Alabama —HL-072524

Programs of Excellence in Nanotechnology, Initiated in Fiscal Year 2005

The purpose of this program is to establish multidisciplinary teams to develop 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 2007—$10,992,900
Fiscal Years 2005–2006—$17,553,560
Total Funding to Date—$28,546,460

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 2007—$14,039,424
Fiscal Years 2000–2006— $195,107,611
Total Funding to Date—$209,147,035

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

* Formerly known as Interaction of Gene and Environment in Shaping Risk Factors for Heart, Lung, and Blood Diseases and Sleep Disorders.

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 American Indians who have 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 2007—$197,305
Fiscal Years 2002–2006— $11,079,036
Total Funding to Date—$11,276,341

Current Active Organization and Grant Number

1. MedStar Research Institute
   Hyattsville, Maryland —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 2007—$6,182,306
Fiscal Years 1988–2006—$57,974,143
Total Funding to Date—$64,156,449

Current Active Organizations and Grant Numbers

1. MedStar Research Institute
   Hyattsville, Maryland —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 2007—$8,912,357
Fiscal Years 2002–2006—$25,529,882
Total Funding to Date—$34,442,239

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

See Chapter 11. Clinical Trials.

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 2007—$2,150,858
Fiscal Years 2003–2006—$15,168,042
Total Funding to Date—$17,318,900

Current Active Organizations and Grant Numbers

1. Kaiser Foundation Research Institute
   Oakland, California —HL-068676
2. Duke University
   Durham, North Carolina —HL-068734
3. Kaiser Foundation Research Institute
   Oakland, California —HL-068790
4. Johns Hopkins University
   Baltimore, Maryland —HL-068920
5. LSU Pennington Biomedical Research Center
   Baton Rouge, Louisiana —HL-068955

Lung Diseases Program

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 2007—$1,532,037
Fiscal Years 2002–2006—$12,542,181
Total Funding to Date—$14,074,218

Current Active Organization and Grant Number

1. Stanford University
   Stanford, California —HL-068060

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 2007—$0
Fiscal Years 2002–2006—$27,350,819
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 III, Initiated in Fiscal Year 2007

The objective of this observational study is to follow the original CAMP cohort for 4 more years (through ages 21–29) to determine clinical and genetic risk factors for patterns of lung function decline indicative of chronic air flow obstruction in later adulthood; 31 percent of the participants are from minority groups.

Obligations

Funding History:
Fiscal Year 2007—$2,077,278
Total Funding to Date—$2,077,278

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. Thirty-four percent of the participants are black.

Obligations

Funding History:
Fiscal Year 2007—$662,283
Fiscal Years 2003–2006—$3,083,552
Total Funding to Date—$3,745,835

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 2007—$2,526,747
Fiscal Years 1999–2006—$36,731,072
Total Funding to Date—$39,257,819

Current Active Organizations and Grant Numbers

1. Southwest Foundation
   for Biomedical Research
   San Antonio, Texas —HL-052636
2. Duke University
   Durham, North Carolina —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. University of Texas Southwestern Medical Center
   Dallas, Texas —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 2007—$923,625
Fiscal Years 2004–2006—$3,145,273
Total Funding to Date—$4,068,898

Current Active Organization and Grant Number

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

Genetic Epidemiology of COPD

The purpose of this study is to perform a genome-wide association analysis to identify the genetic risk factors that determine susceptibility for COPD and COPD-related phenotypes in a large biracial population.

Obligations

Funding History:
Fiscal Year 2007—$6,113,536
Total Funding to Date—$6,113,536

Current Active Organizations and Grant Numbers

1. Brigham and Women's Hospital
   Boston, Massachusetts —HL-089856
2. National Jewish Medical and Research Center
   Denver, Colorado —HL-089897

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 2007—$3,190,981
Fiscal Years 2000–2006—$17,494,738
Total Funding to Date—$20,685,719

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 2007—$1,518,303
Fiscal Years 2005–2006—$6,643,681
Total Funding to Date—$8,161,984

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

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 OSA in children.

Obligations

Funding History:
Fiscal Year 2007—$2,387,691
Fiscal Year 2006—$2,267,140
Total Funding to Date—$4,654,831

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 2007—$625,846
Fiscal Years 1999–2006—$20,511,241
Total Funding to Date—$21,137,087

Current Active Organizations and Grant Numbers

1. University of California, Davis
   Davis, California —HL-053916
2. University of Arizona
   Tucson, Arizona —HL-053934
3. Johns Hopkins University
   Baltimore, Maryland —HL-053937
4. University of Arizona
   Tucson, Arizona —HL-053938
5. Boston University
   Boston, Massachusetts —HL-053941
6. Missouri Breaks Research, Inc.
   Timberlake, South Dakota —HL-063429
7. Case Western Reserve University
   Cleveland, Ohio —HL-063463
8. Johns Hopkins University
   Baltimore, Maryland —HL-064360
9. University of Pittsburgh
   Pittsburgh, Pennsylvania —HL-077813

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. Thirty percent of the participants will be from minority populations.

Obligations

Funding History:
Fiscal Year 2007—$846,333
Fiscal Year 2006—$774,454
Total Funding to Date—$1,620,787

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 2007—$2,096,324
Fiscal Years 2004–2006—$7,281,374
Total Funding to Date—$9,377,698

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 2007—$1,974,477
Fiscal Years 2003–2006—$8,804,219
Total Funding to Date—$10,778,696

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 2007—$3,531,426
Fiscal Years 2005–2006—$7,277,340
Total Funding to Date—$10,808,766

Current Active Organizations and Grant Numbers

1. St. Jude Children's Research Hospital
   Memphis, Tennessee —HL-078787
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.

NHLBI Research Centers (P50) 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 2007**	**FY 2007**	**Total to Date**
Heart and Vascular Diseases Program				
Cardiac Dysfunction and Disease (SCCOR)	2005–	$ 33,420	$ 16,677	$ 50,097
Pediatric Heart Development and Disease (SCCOR)	2004–	39,419	12,411	51,830
Vascular Injury, Repair, and Remodeling (SCCOR)	2006–	15,324	14,924	30,248
Subtotal, Heart and Vascular Diseases Program		88,163	44,012	132,175
Lung Diseases Program				
Airway Biology and Pathogenesis of Cystic Fibrosis	1988–	66,004	3,622	69,626
Chronic Obstructive Pulmonary Disease (SCCOR)	2007–	—	11,276	11,276
Host Factors in Chronic Lung Diseases (SCCOR)	2006–	7,939	7,868	15,807
Neurobiology of Sleep and Sleep Apnea	1998–	47,525	5,767	53,292
Pulmonary Vascular Disease (SCCOR)	2007–	—	6,379	6,379
Translational Research in Acute Lung Injury (SCCOR)	2003–	47,961	12,199	60,160
Subtotal, Lung Diseases Program		169,429	47,111	216,540
Blood Diseases and Resources Program				
Hemostatic and Thrombotic Diseases (SCCOR)	2006–	8,063	8,002	16,065
Transfusion Biology and Medicine (SCCOR)	2005–	8,859	4,425	13,284
Subtotal, Blood Diseases and Resources Program		16,922	12,427	29,349
Total, Specialized Centers of Research (P50)		274,514	103,550	378,064
Centers of Excellence in Translational Human Stem Cell Research	2005–	2,962	1,411	4,373
Subtotal, Centers of Excellence in Translational Human Stem Cell Research		2,962	1,411	4,373
Total, (P50)		**$277,476**	**$104,961**	**$382,437**

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 2007—$16,677,106

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

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 2007—$12,410,785

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 2007—$14,923,676

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 2007—$3,622,413

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

Chronic Obstructive Pulmonary Disease

The purpose of this SCCOR is to foster multidisciplinary research to accelerate progress in the diagnosis, prevention, and treatment of COPD. The program will include a broad spectrum of basic and clinical research that will encompass animal models of COPD pathogenesis, human proteomic, genetic and genomic investigations, technologically refined disease phenotypes classification, and the development of new experimental therapeutic interventions.

Obligations

Fiscal Year 2007—$11,275,633

Current Active Organizations and Grant Numbers

1. Washington University
   St. Louis, Missouri —HL-084922
2. Weill Medical College of Cornell University
   New York, New York —HL-084936
3. Johns Hopkins University
   Baltimore, Maryland —HL-084945
4. University of Pittsburgh
   Pittsburgh, Pennsylvania —HL-084948

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 2007—$7,867,941

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

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 2007—$5,767,416

Current Active Organizations and Grant Numbers

1. University of Pennsylvania
   Philadelphia, Pennsylvania —HL-060287
2. Beth Israel Deaconess Medical Center
   Boston, Massachusetts —HL-060292
3. University of California, Los Angeles
   Los Angeles, California —HL-060296

Pulmonary Vascular Disease

The objective of this SCCOR is to facilitate multidisciplinary research that proposes original hypotheses and applies cutting-edge approaches, including genomics and proteomics, to clinical issues in pulmonary vascular disease.

Obligations

Fiscal Year 2007—$6,379,355

Current Active Organizations and Grant Numbers

1. University of Colorado at Denver
   Denver, Colorado —HL-084923
2. Johns Hopkins University
   Baltimore, Maryland —HL-084946

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 2007—$12,199,089

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 2007—$8,001,975

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 SCCOR 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 2007—$4,424,761

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

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 2007—$1,410,801

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 2007—$23,559,624

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 2007—$7,358,849

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

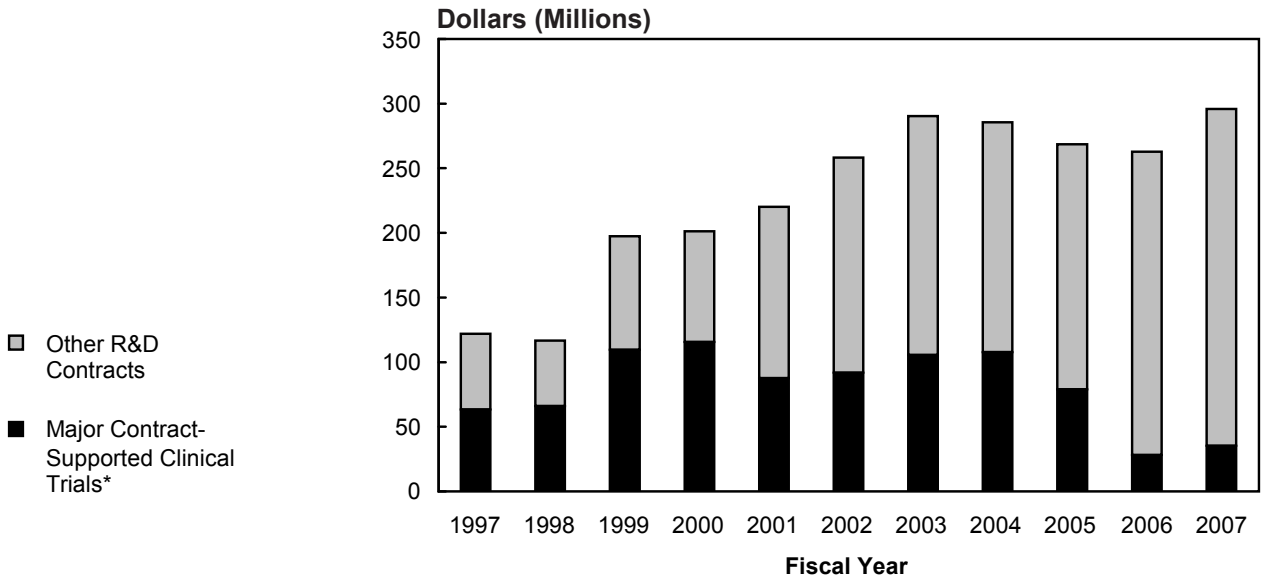
Fiscal Year 2007—$3,571,285

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 1997–2007



* For detailed data on contract-supported clinical trials, see Chapter 11.

NHLBI Total Research and Development Contract Obligations: Fiscal Years 1997–2007

Dollars (Thousands)

	Fiscal Year										
	1997	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Heart	$ 84,820	$ 77,886	$156,370	$156,415	$184,491	$214,971	$258,647	$245,881	$219,796	$213,320	$260,205
Lung	18,183	13,123	25,432	23,341	10,993	16,578	11,745	14,131	20,946	25,902	15,191
Blood	18,934	25,695	15,436	21,538	24,572	26,751	20,082	25,460	27,831	23,629	20,446
Total	**$121,937[A]**	**$116,704[B]**	**$197,238[C]**	**$201,294[D]**	**$220,056[E]**	**$258,300[F]**	**$290,474[G]**	**$285,472[H]**	**$268,573[I]**	**$262,851[J]**	**$295,842[K]**

A Includes Program Evaluation and IMPAC II Assessments of $8,986,000.
B Includes Program Evaluation and IMPAC II Assessments of $12,589,000.
C Includes Program Evaluation and IMPAC II Assessments of $14,904,000.
D Includes Program Evaluation and IMPAC II Assessments of $17,944,000.
E Includes Program Evaluation and IMPAC II Assessments of $24,579,000.
F Includes Program Evaluation and IMPAC II Assessments of $35,827,000.
G Includes Program Evaluation and IMPAC II Assessments of $54,550,000.
H Includes Program Evaluation and IMPAC II Assessments of $57,545,722.
I Includes Program Evaluation and IMPAC II Assessments of $64,399,000.
J Includes Program Evaluation and IMPAC II Assessments of $67,795,000.
K Includes Program Evaluation and IMPAC II Assessments of $68,405,000.
Note: From 1999 to 2006 the WHI was reported separately. In this table, it has been incorporated in the "Heart" line.

Major NHLBI Research and Development Contracts by Program

	Total Obligations Prior to FY 2007	Total FY 2007 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Atherosclerosis Risk in Communities (ARIC)	$128,310,450	$7,085,354	$135,395,804
Candidate Gene Association Research (CARE)	2,789,517	13,472,000	16,261,517
Cardiovascular Health Study (CHS)	76,816,177	355,000	77,171,177
Coronary Artery Risk Development in Young Adults (CARDIA)	78,720,161	3,519,585	82,239,746
DNA Resequencing and Genotyping	18,000,000	6,000,000	24,000,000
Framingham Heart Study	73,073,681	2,926,136	75,999,817
Genetically Triggered Thoracic Aortic Aneurysms and Other Cardiovascular Conditions (GENTAC): National Registry	1,391,748	1,559,965	2,951,713
Hispanic Community Health Study (HCHS)	2,900,000	21,269,620	24,169,620
Jackson Heart Study (JHS)	23,755,565	4,346,757	28,102,322
Multi-Ethnic Study of Atherosclerosis (MESA)	62,833,704	5,833,988	68,667,692
NHLBI Gene Therapy Resource Program (GTRP)		5,900,000	5,900,000
Pediatric Circulatory Support	14,540,343	2,297,000	16,837,343
Proteomics Initiative	97,633,890	18,245,000	115,878,890
Registry for Mechanical Circulatory Support	2,801,579	946,139	3,747,718
SNP Health Association Research (SHARE)	2,000,000	9,172,820	11,172,820
Translational Behavioral Science Research Consortium	20,430,569	4,518,381	24,948,950
Lung Diseases			
Lung Tissue Research Consortium	23,098,806	—	23,098,806
Tuberculosis Curriculum Coordinating Center	4,875,000	—	4,875,000
Blood Diseases and Resources			
Maintenance of Animals for Hepatitis or AIDS Research	8,966,004	466,117	9,432,121
Maintenance of NHLBI Biological Specimen Repository	7,625,914	2,181,239	9,807,153
Retrovirus Epidemiology Donor Study II (REDS-II)	95,820,174	8,437,846	104,258,020
Sickle Cell Disease Health-Related Quality of Life Questionnaire	1,292,008	179,000	1,471,008
Somatic Cell Therapy Processing Facilities	21,715,735	17,000	21,732,735

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.

In 2006, the study began conducting a community surveillance of inpatients (ages ≥55 years) and outpatients (ages ≥65 years) who have heart failure. The study will continue through 2009 to determine the number of heart failure events occurring during the 2005–2009 period.

Obligations

Funding History:
Fiscal Year 2007—$7,085,354
Fiscal Years 1985–2006—$128,310,450
Total Funding to Date—$135,395,804

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

Candidate Gene Association Resources (CARE), 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 2007—$13,472,000
Fiscal Year 2006—$2,789,517
Total Funding to Date—$16,261,517

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 CHS and stroke in elderly adults, 17 percent of whom are from minority populations. Extensive data and samples have been collected from nearly 6,000 participants since 1989–1990. The current CHS: Transition Phase is sharing support for an infrastructure to enable continued access to study resources and expertise, scientific collaborations, and mentorship of early-career investigators.

Obligations

Funding History:
Fiscal Year 2007—$355,000
Fiscal Years 1988–2006—$76,816,177
Total Funding to Date—$77,171,177

Current Active Organization and Contract Number

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 mass index, 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 2007—$3,519,585
Fiscal Years 1984–2006—$78,720,161
Total Funding to Date—$82,239,746

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 2007—$6,000,000
Fiscal Years 2004–2006—$18,000,000
Total Funding to Date—$24,000,000

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. J. Craig Venter Institute, Inc.
   Rockville, Maryland —HV-48196

Framingham Heart Study

The original 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 2007—$2,926,136
Fiscal Years 1983–2006—$73,073,681
Total Funding to Date—$75,999,817

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 2007—1,559,965
Fiscal Year 2006—$1,391,748
Total Funding to Date—$2,951,713

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 2007—21,269,620
Fiscal Year 2006—$2,900,000
Total Funding to Date—$24,169,620

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 2007—$4,346,757
Fiscal Years 1998–2006—$23,755,565
Total Funding to Date—$28,102,322

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. In 2007, the fourth cohort examination was completed and plans are underway to continue periodic monitoring of participants to identify recent hospitalizations and other clinical events.

Obligations

Funding History:
Fiscal Year 2007—$5,833,988
Fiscal Years 1999–2006—$62,833,704
Total Funding to Date—$68,667,692

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

NHLBI Gene Therapy Resource Program (GTRP), Initiated in Fiscal Year 2007

The purpose of this program is to promote the translation of basic research into clinical trials. The program will support the production of safe and well-characterized vectors; conduct extensive toxicology and pharmacology studies on animals to determine vector dosing, related toxicity, and vector dissemination; and provide investigators with regulatory assistance to initiate a clinical trial. The GTRP also will support a maximum of two phase I/II gene transfer clinical trials per year that have successfully met all regulatory requirements and are ready to enroll patients within 12 months of application approval.

Obligations

Funding History:
Fiscal Year 2007—$5,900,000
Total Funding to Date—$5,900,000

Current Active Organizations and Contract Numbers

1. Social and Scientific Systems, Inc.
   Silver Spring, Maryland —HV-78200
2. Lovelace Biomedical Research & Education Institute
   Albuquerque, New Mexico —HV-78201
3. University of Pennsylvania
   Philadelphia, Pennsylvania —HV-78202
4. Children's Hospital of Philadelphia
   Philadelphia, Pennsylvania —HV-78203
5. Indiana University
   Indianapolis, Indiana —HV-78204

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 2007—$2,297,000
Fiscal Years 2004–2006—$14,540,343
Total Funding to Date—$16,837,343

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 2007—$18,245,000
Fiscal Years 2002–2006—$97,633,890
Total Funding to Date—$115,878,890

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 2007—$946,139
Fiscal Years 2005–2006—$2,801,579
Total Funding to Date—$3,747,718

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. The first study involves more than 14,000 participants in the Framingham Heart Study. Genotype and phenotype data from the study will be available to qualified and approved applicants beginning October 1, 2007. Two studies will be added in 2008 and 2009.

Obligations

Funding History:
Fiscal Year 2007—$9,172,820
Fiscal Year 2006—$2,000,000
Total Funding to Date—$11,172,820

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 2007—$4,518,381
Fiscal Years 2002–2006—$20,430,569
Total Funding to Date—$24,948,950

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 2007—$0
Fiscal Years 2004–2006—$23,098,806
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 2007—$0
Fiscal Years 2003–2006—$4,875,000
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

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 (HCV), hepatitis B virus (HBV), and HIV) for which the chimpanzee is the only known animal model.

Obligations

Funding History:
Fiscal Year 2007—$466,117
Fiscal Years 1992–2006—$8,966,004
Total Funding to Date—$9,432,121

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 2007—$2,181,239
Fiscal Years 1998–2006—$7,625,914
Total Funding to Date—$9,807,153

Current Active Organization and Contract Number

1. SeraCare Life Sciences, Inc.
   Rockville, Maryland —HB-87144

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. An international component has been added to the REDS study to conduct epidemiologic, laboratory, and survey research on the blood donors in China and Brazil.

Obligations

Funding History:
Fiscal Year 2007—$8,437,846
Fiscal Years 1989–2006—$95,820,174
Total Funding to Date—$104,258,020

Current Active Organizations and Contract Numbers

1. Blood Center of Southeastern Wisconsin
   Milwaukee, Wisconsin —HB-47168
2. American Red Cross Blood Service,
   New England
   Farmington, Connecticut —HB-47169
3. Emory University
   Atlanta, Georgia —HB-47170
4. University of Cincinnati
   Cincinnati, Ohio —HB-47171
5. Institute for Transfusion Medicine
   Pittsburgh, Pennsylvania —HB-47172
6. University of California, San Francisco
   San Francisco, California —HB-47174
7. Westat, Inc.
   Rockville, Maryland —HB-47175
8. 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 2007—$179,000
Fiscal Years 2005–2006—$1,292,008
Total Funding To Date—$1,471,008

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 2007—$17,000
Fiscal Years 2003–2006—$21,715,735
Total Funding to Date—$21,732,735

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 1997–2007

Research Grants and Cooperative Agreements (Dollars in Thousands)

	Fiscal Year										
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Heart and Vascular Diseases											
Program on Surgical Control of Hyperlipidemias (POSCH)	$ 294	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Infant Heart Surgery: Central Nervous System Sequelae of Circulatory Arrest	685	582	584	392	75	—	—	—	—	—	—
Women's Health Study (WHS)	1,473	1,536	1,530	1,594	—	—	—	—	889	—	735
Cardiovascular Risk Factors and the Menopause	494	528	186	—	—	—	—	—	—	—	—
CABG Patch Trial*	1,171	—	—	—	—	—	—	—	—	—	—
Women's Antioxidant and Cardiovascular Study (WACS)	501	525	540	556	572	598	592	599	670	—	—
Oral Calcium in Pregnant Women With Hypertension	332	—	—	—	—	—	—	—	—	—	—
Stress Reduction and Atherosclerotic CVD in Blacks	407	40	326	339	360	376	394	—	—	—	—
Enalapril After Anthracycline Cardiotoxicity	724	789	—	—	—	—	—	—	—	—	—
Stress and Anger Management for Blacks With Hypertension	250	—	—	—	—	—	—	—	—	—	—
Estrogen Replacement and Atherosclerosis (ERA) Trial*	965	1,668	1,017	—	—	—	—	—	—	—	—
Shock Trial: Should We Emergently Revascularize Occluded Coronaries for Cardiogenic Shock?	826	874	—	440	362	298	291	296	—	—	—
HDL-Atherosclerosis Treatment Study	445	340	—	326	—	—	—	—	—	—	—
Women's Estrogen/Progestin Lipid Lowering Hormone Atherosclerosis Regression Trial (WELL-HART)*	1,196	1,269	1,131	—	32	—	—	—	—	—	—
Mode Selection Trial in Sinus Node Dysfunction (MOST)*	2,096	1,700	2,879	1,136	154	—	—	—	—	—	—
Antioxidants and Prevention of Early Atherosclerosis*	603	—	—	—	—	—	—	—	—	—	—
Postmenopausal Hormone Therapy in Unstable Angina	264	271	276	—	—	—	—	—	—	—	—
Estrogen and Graft Atherosclerosis Research Trial (EAGER)*	488	305	—	361	371	—	—	—	—	—	—
Soy Estrogen Alternative Study (SEA)	217	221	—	—	—	—	—	—	—	—	—
REMATCH Trial*	1,258	1,798	1,333	825	750	—	—	—	—	—	—

* Paid by U01/U10.

NHLBI Investigator-Initiated Clinical Trials: Fiscal Years 1997–2007 (continued)

Research Grants and Cooperative Agreements (Dollars in Thousands)

	Fiscal Year										
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Heart and Vascular Diseases (continued)											
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	1,452
Bypass Angioplasty Revascularization Investigation in Type 2 Diabetics (BARI 2D)*	—	—	—	3,942	6,515	9,342	8,189	8,265	8,304	8,592	2,647
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	304
Reduction of Triglycerides in Women on HRT	—	—	—	—	708	746	555	544	721	—	625
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	2,846
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	—
Stop Atherosclerosis in Native Diabetics Study (SANDS)*	—	—	—	—	—	2,410	2,165	2,107	2,324	2,074	197
Surgical Treatment for Ischemic Heart Failure (STICH)*	—	—	—	—	—	5,709	4,495	1,613	6,082	5,583	9,396

* Paid by U01/U10.
** Previously an Institute-Initiated Clinical Trial.

NHLBI Investigator-Initiated Clinical Trials: Fiscal Years 1997–2007 (continued)

Research Grants and Cooperative Agreements (Dollars in Thousands)

	Fiscal Year										
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Heart and Vascular Diseases (continued)											
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	885
Weight Loss Maintenance (WLM)*	—	—	—	—	—	—	3,687	4,368	3,099	4,015	2,151
Cardiovascular Outcomes in Renal Atherosclerotic Lesions (CORAL)*	—	—	—	—	—	—	—	4,343	5,610	4,884	3,307
FREEDOM Trial: Future Revascularization Evaluation in Patients With Diabetes Mellitus: Optional Management of Multivessel Disease	—	—	—	—	—	—	—	3,663	4,669	—	5,180
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	6,018
Claudication: Exercise Versus Endoluminal Revascularization (CLEVER)*	—	—	—	—	—	—	—	—	1,368	1,478	1,898
Intervention To Control Obesity in College	—	—	—	—	—	—	—	—	—	677	633
PACEmaker and Beta-Blocker Therapy Post-Myocardial Infarction (PACE-MI)	—	—	—	—	—	—	—	—	—	1,300	4,555
Efficacy of Smoking Quit Line in the Military	—	—	—	—	—	—	—	—	—	—	739
Vest prevention of Early Sudden death Trial (VEST) and PREDiction of ICd Therapies Studies (PREDICTS)*	—	—	—	—	—	—	—	—	—	—	1,390
Subtotal, Heart and Vascular Diseases	19,483	23,265	29,111	26,578	22,996	45,253	50,163	52,377	56,681	58,312	44,958
Lung Diseases											
Inhaled Beclomethasone To Prevent Chronic Lung Disease*	436	—	—	—	—	—	—	—	—	—	—
Lung Health Study II* **	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 1997–2007 (continued)

Research Grants and Cooperative Agreements (Dollars in Thousands)

	Fiscal Year										
	1997	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Lung Diseases (continued)											
Apnea Positive Pressure Long-Term Efficacy Study (APPLES)*	—	—	—	—	—	3,224	3,021	3,110	3,188	—	1,532
Childhood Asthma Management Program-Continuation Study (CAMP-CS)/Phase II* **	—	—	—	—	—	—	1,489	2,043	2,623	2,750	—
Clinical Trial of Acid Reflux Therapy in Asthma*	—	—	—	—	—	—	736	783	791	773	662
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	910
Supplemental Selenium and Vitamin E and Pulmonary Function	—	—	—	—	—	—	698	610	630	605	561
Improving Asthma Care in Minority Children in Head Start	—	—	—	—	—	—	—	721	826	1,004	779
Adenotonsillectomy for Childhood Sleep Apnea	—	—	—	—	—	—	—	—	—	2,255	2,388
Early Insulin Therapy and Development of ARDS	—	—	—	—	—	—	—	—	—	—	489
Childhood Asthma Management Program—Continuation Study (CAMP-CS)/Phase III* **	—	—	—	—	—	—	—	—	—	—	2,077
Subtotal, Lung Diseases	3,944	7,911	8,844	15,484	17,076	18,974	15,639	14,289	10,056	9,294	9,398
Blood Diseases and Resources											
Stroke Prevention in Sickle Cell Anemia (STOP)*	2,584	2,036	—	293	—	—	—	—	—	—	—
Pediatric Hydroxyurea in Sickle Cell Anemia (PED HUG)	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	1,974
Stroke With Transfusions Changing to Hydroxyurea (SWITCH)*	—	—	—	—	—	—	—	—	3,345	3,932	3,531
Subtotal, Blood Diseases and Resources	2,854	2,036	—	4,493	4,877	4,917	5,772	6,066	6,268	6,378	5,505
Total, NHLBI	**$26,281**	**$33,212**	**$37,955**	**$46,555**	**$44,949**	**$69,144**	**$71,574**	**$82,220**	**$73,005**	**$73,984**	**$59,861**

* Paid by U01/U10.
** Previously an Institute-Initiated Clinical Trial.

NHLBI Investigator-Initiated Clinical Trials, Fiscal Year 2007: Summary by Program

	Total Obligations Prior to FY 2007	FY 2007 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
AIM HIGH: Niacin Plus Statin To Prevent Vascular Events*	$ 6,987,287	$ 6,018,096	$ 13,005,383
Bypass Angioplasty Revascularization Investigation in Type 2 Diabetes (BARI 2D)*	53,150,028	2,646,947	55,796,975
Cardiovascular Outcomes in Renal Atherosclerotic Lesions (CORAL)*	14,837,498	3,306,675	18,144,173
Claudication: Exercise Versus Endoluminal Revascularization (CLEVER)*	2,846,994	1,898,415	4,745,409
Efficacy of Smoking Quit Line in the Military	—	738,869	738,869
FREEDOM Trial: Future Revascularization Evaluation in Patients With Diabetes Mellitus: Optimal Management of Multivessel Disease	8,332,457	5,180,309	13,512,766
Heart Failure: A Controlled Trial Investigating Outcomes of Exercise Training*	34,099,521	2,846,477	36,945,998
Heart Failure Adherence and Retention Trial (HART)	6,639,821	304,393	6,944,214
Interventions To Control Obesity in College	667,082	633,146	1,300,228
Occluded Artery Trial (OAT)	17,224,514	1,452,378	18,676,892
PACEmaker and Beta-Blocker Therapy Post-Myocardial Infarction (PACE-MI)*	1,300,000	4,554,590	5,854,590
Reduction of Triglycerides in Women on HRT	3,275,109	625,001	3,900,110
Stop Atherosclerosis in Native Diabetics Study (SANDS)*	11,079,036	197,305	11,276,341
Surgical Treatment for Ischemic Heart Failure (STICH)*	23,482,321	9,395,837	32,878,158
Treatment of Depression Following Bypass Surgery	4,469,703	884,570	5,354,273
Vest prevention of Early Sudden death Trial (VEST) and PREDiction of ICd Therapies Studies (PREDICTS)*	—	1,389,760	1,389,760
Weight Loss Maintenance (WLM)*	15,168,042	2,150,858	17,318,900
Women's Health Study (WHS)	16,922,647	735,367	17,658,014
Subtotal, Heart and Vascular Diseases	220,482,060	44,958,993	265,441,053
Lung Diseases			
Acid Reflux Therapy in Asthma*	3,083,552	662,283	3,745,835
Adenotonsillectomy for Childhood Sleep Apnea*	2,254,440	2,387,691	4,642,131
APPLES: Apnea Positive Pressure Long-Term Efficacy Study*	12,542,181	1,532,037	14,074,218
Childhood Asthma Management Program III (CAMP III)*	—	2,077,278	2,077,278
Early Insulin Therapy and Development of ARDS	—	489,176	489,176
Improving Asthma Care for Minority Children in Head Start	2,551,490	779,283	3,330,773
Outcomes of Sleep Disorders in Older Men	10,956,384	910,480	11,866,864
Supplemental Selenium and Vitamin E and Pulmonary Function	2,542,694	560,835	3,103,529
Subtotal, Lung Diseases	33,930,741	9,399,063	43,329,804
Blood Diseases and Resources			
FOCUS*	8,804,219	1,974,477	10,778,696
Stroke With Transfusions Changing to Hydroxyurea (SWITCH)*	7,277,340	3,531,426	10,808,766
Subtotal, Blood Diseases and Resources	16,081,559	5,505,903	21,587,462
TOTAL, NHLBI	**$270,494,360**	**$59,863,959**	**$330,358,319**

* Paid by U01/U10.

Institute-Initiated Clinical Trials: Fiscal Years 1997–2007

Contracts

	Dollars (Thousands)										
	Fiscal Year										
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Heart and Vascular Diseases											
Lipid Research Clinics	$ 650	$ 685	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Raynaud's Treatment Study	19	—	—	—	—	—	—	—	—	—	—
Antiarrhythmic vs. Implantable Defibrillator (AVID)	—	871	548	—	—	—	—	—	—	—	—
Antihypertensive and Lipid-Lowering Treatment To Prevent Heart Attack Trial (ALLHAT)	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)	6,837	5,904	3,303	3,487	596	425	70	—	—	—	—
Atrial Fibrillation Follow-Up: Investigation in Rhythm Management (AFFIRM)	6,330	—	3,785	1,239	2,401	802	—	—	—	—	—
Beta-Blocker Evaluation Survival Trial (BEST)	2,300	2,448	—	—	—	—	—	—	—	—	—
Women's Angiographic Vitamin and Estrogen Trial (WAVE)	2,891	1,917	3,878	886	756	—	32	—	—	—	—
Women's Ischemia Syndrome Evaluation (WISE)	133	2,932	856	1,424	10	50	—	—	—	—	—
Prevention of Events With Angiotensin Converting Enzyme Inhibitor Therapy (PEACE)	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	—	19,484
Women's Health Initiative	—	—	59,100	57,700	59,200	59,010	63,222	57,483	37,826	12,124	14,873
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	2,218
Subtotal, Heart and Vascular Diseases	40,111	38,490	85,132	89,050	73,021	71,334	85,164	95,445	69,114	17,915	36,575
Lung Diseases											
Pediatric Pulmonary and Cardiac Complications of HIV Infection (P2C2)	668	1,979	—	315	—	113	—	—	—	—	—
Childhood Asthma Management Program (CAMP)	5,695	—	6,551	729	1,330	2,786	2,287	1,475	599	—	—

Institute-Initiated Clinical Trials: Fiscal Years 1997–2007 (continued)

Contracts (continued)

	Dollars (Thousands)										
	Fiscal Year										
	1997	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Acute Respiratory Distress Syndrome Clinical Network (ARDSNET)	4,510	4,880	6,837	5,587	2,667	1,502	4,402	5,517	4,707	7,396	5,037
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	—	—
Long-Term Oxygen Treatment Trial (LOTT)	—	—	—	—	—	—	—	—	—	—	6,208
Subtotal, Lung Diseases	13,583	10,226	21,817	18,389	10,986	14,740	9,044	9,147	5,848	7,396	11,245
Blood Diseases and Resources											
Clinical Course of Sickle Cell Disease	205	2,144	350	106	—	—	—	—	—	—	—
T-Cell Depletion in Unrelated Donor Marrow Transplantation	639	2,228	690	1,085	1,144	557	774	164	—	—	—
Viral Activation Transfusion Study (VATS)	2,353	1,668	—	339	—	—	—	—	—	—	—
Cord Blood Stem Cell Transplantation Study (COBLT)	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	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	3,966
Sildenafil for Sickle Cell Disease-Associated Pulmonary Hypertension	—	—	—	—	—	—	—	—	—	1,867	2,801
Subtotal, Blood Diseases and Resources	10,242	19,045	2,965	8,258	3,395	6,411	3,468	3,971	3,688	2,758	6,767
Total, NHLBI Clinical Trials Contracts	**$63,936**	**$67,761**	**$109,914**	**$115,697**	**$87,402**	**$92,485**	**$97,676**	**$108,563**	**$78,650**	**$28,069**	**$54,587**

Institute-Initiated Clinical Trials: Fiscal Years 1997–2007 (continued)

Cooperative Agreements

	Dollars (Thousands)										
	Fiscal Year										
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Heart and Vascular Diseases											
Dietary Intervention Study in Children (DISC)	$ 746	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Bypass Angioplasty Revascularization Investigation (BARI)	2,894	1,360	1,609	1,634	1,549	1,456	—	—	—	—	—
Child and Adolescent Trial for Cardiovascular Health (CATCH)	3,956	572	210	—	—	—	—	—	—	—	—
Dietary Effects on Lipoproteins and Thrombogenic Activity (DELTA)	290	—	—	—	—	—	—	—	—	—	—
Obesity Prevention in Young American Indians (PATHWAYS)	4,119	3,945	4,196	2,459	—	—	—	—	—	—	—
Rapid Early Action for Coronary Treatment (REACT)	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 Heart Network	—	—	—	—	3,447	4,822	5,381	4,948	3,992	6,988	6,607
Clinical Research Consortium To Improve Resuscitation Outcome	—	—	—	—	—	—	—	6,886	9,339	9,728	8,972
Dynamic Assessment of Patient-Reported Chronic Disease Outcomes	—	—	—	—	—	—	—	1,010	—	—	—
Clinical Trials in Organ Transplantation (CTOT)	—	—	—	—	—	—	—	—	1,900	1,855	1,801
Heart Failure Clinical Research Network	—	—	—	—	—	—	—	—	—	5,642	7,801
Weight Loss in Obese Adults With CVD Risk Factors	—	—	—	—	—	—	—	—	—	2,567	3,714
Community-Responsive Interventions To Reduce Cardiovascular Risk in American Indians and Alaska Natives	—	—	—	—	—	—	—	—	—	1,419	2,314
Pediatric HIV/AIDS Cohort Study (PHACS)—Data and Operations Center	—	—	—	—	—	—	—	—	—	1,000	500

Institute-Initiated Clinical Trials: Fiscal Years 1997–2007 (continued)

Cooperative Agreements (continued)

	Dollars (Thousands)										
	Fiscal Year										
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Heart and Vascular Diseases (continued)											
Network for Cardiothoracic Surgical Investigations in Cardiovascular Medicine	—	—	—	—	—	—	—	—	—	—	6,009
Cardiovascular Cell Therapy Research Network (Stem Cell)	—	—	—	—	—	—	—	—	—	—	4,424
Subtotal, Heart and Vascular Diseases	14,871	6,373	8,297	11,732	12,704	14,910	11,209	19,194	20,334	30,104	42,142
Lung Diseases											
Asthma Clinical Research Network (ACRN)*	4,479	—	—	—	—	—	8,181	8,424	8,667	7,839	8,918
Asthma and Pregnancy Studies	913	—	—	—	—	—	—	—	—	—	—
Childhood Asthma Research and Education (CARE) Network	—	—	4,175	5,002	5,314	6,005	5,610	5,292	5,704	5,735	5,916
COPD Clinical Research Network	—	—	—	—	—	—	6,843	6,848	8,438	7,664	6,836
Idiopathic Pulmonary Fibrosis Clinical Research Network	—	—	—	—	—	—	—	—	3,486	7,349	7,216
NICHD Cooperative Multicenter Neonatal Research Network	—	—	—	—	—	—	—	—	—	1,336	238
Subtotal, Lung Diseases	5,392	—	4,175	5,002	5,314	6,005	20,634	20,564	26,295	29,923	29,124
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	2,618
Blood and Marrow Transplant Clinical Research Network	—	—	—	—	5,360	5,899	5,950	5,972	6,460	6,845	6,709
Transfusion Medicine/ Hemostasis Clinical Research Network	—	—	—	—	—	6,053	6,241	6,093	6,221	6,521	6,407
Sickle Cell Disease Clinical Research Network	—	—	—	—	—	—	—	—	—	3,761	7,498
Subtotal, Blood Diseases and Resources	—	—	—	2,192	7,579	14,221	14,511	14,440	15,411	19,809	23,232
Total, NHLBI-Initiated Clinical Trials, Cooperative Agreements	**$20,263**	**$6,373**	**$12,472**	**$18,926**	**$25,597**	**$35,136**	**$46,354**	**$54,198**	**$62,040**	**$79,836**	**$94,498**
Total, NHLBI-Initiated Clinical Trials	**$84,199**	**$74,134**	**$122,386**	**$134,623**	**$112,999**	**$127,621**	**$144,030**	**$162,761**	**$140,690**	**$107,905**	**$149,085**

* Investigator-Initiated from 1998 to 2002.

Institute-Initiated Clinical Trials, Fiscal Year 2007: Summary by Program

Contracts

	Total Obligations Prior to FY 2007	Total FY 2007 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Action to Control Cardiovascular Risk in Diabetes (ACCORD)	$ 90,895,802	$19,484,056	$110,379,858
Trial of Aldosterone Antagonists Therapy in Adults With Ejection Fraction Congestive Heart Failure (TOPCAT)	11,478,663	2,217,724	13,696,387
Women's Health Initiative	722,565,555	14,872,780	737,438,335
Subtotal, Heart and Vascular Diseases	824,940,020	36,574,560	861,514,580
Lung Diseases			
Acute Respiratory Distress Syndrome Clinical Network (ARDSNET)	58,311,705	5,036,653	63,348,358
Long-Term Oxygen Treatment Trial (LOTT)	—	6,208,395	6,208,395
Subtotal, Lung Diseases	58,311,705	11,245,048	69,556,753
Blood Diseases and Resources			
Pediatric Hydroxyurea Phase III Clinical Trial (BABY HUG)	10,604,399	3,966,000	14,570,399
Sildenafil for Sickle Cell Disease-Associated Pulmonary Hypertension	1,867,000	2,801,174	4,668,174
Subtotal, Blood Diseases and Resources	12,471,399	6,767,174	19,238,573
Total, NHLBI-Initiated Clinical Trials, Contracts	**$895,723,124**	**$54,586,782**	**$950,309,906**

Note: From 1999 to 2006, the WHI was reported separately under its own major heading. In this table, it is included in the Heart and Vascular Diseases section.

Cooperative Agreements

	Total Obligations Prior to FY 2007	Total FY 2007 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Cardiovascular Cell Therapy Research Network (Stem Cell)	$ —	$ 4,424,183	$ 4,424,183
Clinical Research Consortium To Improve Resuscitation Outcome	25,952,727	8,971,584	34,924,311
Clinical Trials in Organ Transplantation (CTOT)	3,755,350	1,801,545	5,556,895
Community-Responsive Interventions To Reduce Cardiovascular Risk in American Indians and Alaska Natives	1,418,746	2,314,003	3,732,749
Heart Failure Clinical Research Network	5,642,461	7,800,582	13,443,043
Network for Cardiothoracic Surgical Investigations in Cardiovascular Medicine	—	6,008,848	6,008,848
Pediatric Heart Network	29,578,646	6,607,550	36,186,196
Pediatric HIV/AIDS Cohort Study—Data and Operations Center	1,000,000	500,000	1,500,000
Trial of Activity for Adolescent Girls (TAAG)	34,211,102	—	34,211,102
Weight Loss in Obese Adults With CVD Risk Factors	2,567,146	3,713,946	6,281,092
Subtotal, Heart and Vascular Diseases	104,126,178	42,142,241	146,268,419
Lung Diseases			
Asthma Clinical Research Network (ACRN), Phase II	33,110,894	8,917,879	42,028,773
Childhood Asthma Research and Education (CARE) Network	42,837,293	5,915,840	48,753,133
COPD Clinical Research Network	29,793,928	6,836,458	36,630,386
Idiopathic Pulmonary Fibrosis Clinical Research Network	10,835,422	7,216,255	18,051,677
NICHD Cooperative Multicenter Neonatal Research Network	1,336,159	237,647	1,573,806
Subtotal, Lung Diseases	117,913,696	29,124,079	147,037,775
Blood Diseases and Resources			
Blood and Marrow Transplant Clinical Research Network	36,486,721	6,708,880	43,195,601
Sickle Cell Disease Clinical Research Network	3,761,385	7,497,847	11,259,232
Thalassemia (Cooley's Anemia) Clinical Research Network	16,787,170	2,618,369	19,405,539
Transfusion Medicine/Hemostasis Clinical Research Network	31,128,254	6,407,000	37,535,254
Subtotal, Blood Diseases and Resources	88,163,530	23,232,096	111,395,626
Total, NHLBI-Initiated Clinical Trials, Cooperative Agreements	**$ 310,203,404**	**$ 94,498,416**	**$ 404,701,820**
Total, NHLBI-Initiated Clinical Trials	**$1,205,926,528**	**$149,085,198**	**$1,355,011,726**

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 2007—$19,484,056
Fiscal Years 1999–2006—$90,895,802
Total Funding to Date—$110,379,858

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

Cardiovascular Cell Therapy Research Network, Initiated in Fiscal Year 2007

The purpose of this program is to establish a research network to evaluate innovative cell therapy treatment strategies for individuals with CVD. The network will provide the necessary infrastructure to develop, coordinate, and conduct multiple collaborative clinical protocols to facilitate application of emerging scientific discoveries to improve CVD outcomes.

Obligations

Funding History:
Fiscal Year 2007—$4,424,183
Total Funding to Date—$4,424,183

Current Active Organizations and Grant Numbers

1. Case Western Reserve University
   Cleveland, Ohio —HL-087314
2. University of Texas Health Science Center
   Houston, Texas —HL-087318
3. Texas Heart Institute
   Houston, Texas —HL-087365
4. University of Florida
   Gainesville, Florida —HL-087366
5. University of Minnesota, Twin Cities
   Minneapolis, Minnesota —HL-087394
6. Vanderbilt University
   Nashville, Tennessee —HL-087403

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 2007—$8,971,584
Fiscal Years 2004–2006—$25,952,727
Total Funding to Date—$34,924,311

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 2007—$1,801,545
Fiscal Years 2005–2006—$3,755,350
Total Funding to Date—$5,556,895

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

Community-Responsive Interventions To Reduce Cardiovascular Risk in American Indians and Alaska Natives, Initiated in Fiscal Year 2006

The purpose of this program is to develop and evaluate the effectiveness of culturally appropriate interventions to promote the adoption of healthy life-style behaviors to reduce CVD risk in American Indian/ Alaska Native communities. Interventions will focus on weight reduction, regular physical activity, and smoking cessation. A central feature of this project is to develop interventions that can be incorporated into clinical programs of the community health care system or delivered through public health approaches in Native communities.

Obligations

Funding History:
Fiscal Year 2007—$2,314,003
Fiscal Year 2006—$1,418,746
Total Funding to Date—$3,732,749

Current Active Organizations and Grant Numbers

1. University of Washington
   Seattle, Washington —HL-087322
2. University of Oklahoma Health Sciences Center
   Oklahoma City, Oklahoma —HL-087354
3. University of Wisconsin—Madison
   Madison, Wisconsin —HL-087381
4. Black Hills Center/American Indian Health
   Rapid City, South Dakota —HL-087422

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 2007—$7,800,582
Fiscal Year 2006—$5,642,461
Total Funding to Date—$13,443,043

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. Morehouse School of Medicine
   Atlanta, Georgia —HL-084891
7. University of Vermont and State Agriculture College
   Burlington, Vermont —HL-084899

8. Duke University
   Durham, North Carolina —HL-084904
9. Mayo Clinic College of Medicine
   Rochester, Minnesota —HL-084907
10. Montreal Heart Institute
    Montreal, Quebec, Canada —HL-084931

Network for Cardiothoracic Surgical Investigations in Cardiovascular Medicine, Initiated in Fiscal Year 2007

The purpose of this program is to establish a network to evaluate newer surgical techniques, technologies, devices, and innovative pharmaceutical and bioengineered products directed at CVD to ensure that the public has access to the best procedures determined by careful assessment. The Network will also serve as a clinical trials training ground for fellows and junior faculty.

Obligations

Funding History:
Fiscal Year 2007—$6,008,848
Total Funding to Date—$6,008,848

Current Active Organizations and Grant Numbers

1. University of Virginia, Charlottesville
   Charlottesville, Virginia —HL-088925
2. Emory University
   Atlanta, Georgia —HL-088928
3 Yeshiva University
   Bronx, New York —HL-088939
4. Columbia University Health Sciences
   New York, New York —HL-088942
5. Columbia University Health Sciences
   New York, New York —HL-088951
6. Duke University
   Durham, North Carolina —HL-088953
7. Case Western Reserve University
   Cleveland, Ohio —HL-088955
8. University of Pennsylvania
   Philadelphia, Pennsylvania —HL-088957
9. Montreal Heart Institute
   Montreal, Quebec, Canada —HL-088963

Pediatric Heart Network, Initiated in Fiscal Year 2001

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 2007—$6,607,550
Fiscal Years 2001–2006—$29,578,646
Total Funding to Date—$36,186,196

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 2007—$500,000
Fiscal Year 2006—$1,000,000
Total Funding to Date—$1,500,000

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 2007—$0
Fiscal Years 2000–2006—$34,211,102
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. University of Maryland
   College Park, 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 2007—$2,217,724
Fiscal Years 2004–2006—$11,478,663
Total Funding to Date—$13,696,387

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. All of the participants will be from minority populations.

Obligations

Funding History:
Fiscal Year 2007—$3,713,946
Fiscal Year 2006—$2,567,146
Total Funding to Date—$6,281,092

Current Active Organizations and Grant Numbers

1. Washington University
   St. Louis, Missouri —HL-087071
2. University of Pennsylvania
   Philadelphia, Pennsylvania —HL-087072
3. Johns Hopkins University
   Baltimore, Maryland —HL-087085

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.

In 2007, the WHI began a program to maximize the scientific yield from the biologic resources and associated participant exposure and outcome data from the study. The program seeks innovative technologies that will enable comprehensive investigation of sets of markers associated with disease outcomes or treatment effects, or of groups of mediators that might explain the pathway of exposure or treatment effects on disease outcomes.

Obligations

Funding History:
Fiscal Year 2007—$14,872,780
Fiscal Years 2000–2005*—$722,565,555
Total Funding to Date—$737,438,335

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. Emory University
    Atlanta, Georgia —WH-32111
11. University of Pittsburgh
    Pittsburgh, Pennsylvania —WH-32112
12. University of California, Davis
    Davis, California —WH-32113
13. University of Arizona
    Tucson, Arizona —WH-32115
14. University of Tennessee
    Memphis, Tennessee —WH-32118
15. Memorial Hospital of Rhode Island
    Pawtucket, Rhode Island —WH-32119
16. State University of New York at Buffalo
    Buffalo, New York —WH-32122
17. University of California, Irvine
    Irvine, California —WH-42107
18. George Washington University
    Washington, DC —WH-42108
19. Stanford University
    Stanford, California —WH-42109
20. Baylor College of Medicine
    Houston, Texas —WH-42110
21. University of Texas
    Health Science Center
    San Antonio, Texas —WH-42111
22. Ohio State University
    Columbus, Ohio —WH-42112
23. University of Nevada
    School of Medicine
    Reno, Nevada —WH-42113
24. Kaiser Foundation Research Institute
    Oakland, California —WH-42114
25. State University of New York at Stony Brook
    Stony Brook, New York —WH-42115
26. University of Massachusetts Medical School
    Worcester, Massachusetts —WH-42116
27. University of North Carolina at Chapel Hill
    Chapel Hill, North Carolina —WH-42117
28. Wayne State University
    Detroit, Michigan —WH-42118
29. Albert Einstein College of Medicine
    New York, New York —WH-42119
30. Harbor-UCLA Research and Education Institute
    Torrance, California —WH-42120
31. Kaiser Foundation Research Institute
    Oakland, California —WH-42121
32. Medical College of Wisconsin
    Milwaukee, Wisconsin —WH-42122
33. Medlantic Research Institute
    Washington, DC —WH-42123
34. Rush-Presbyterian-St. Luke's Medical Center
    Chicago, Illinois —WH-42124
35. University of Cincinnati
    Medical Center
    Cincinnati, Ohio —WH-42126
36. University of Florida
    College of Medicine
    Gainesville, Florida —WH-42129
37. University of Hawaii at Manoa
    Honolulu, Hawaii —WH-42130
38. University of Miami
    Miami, Florida —WH-42131
39. University of Wisconsin
    Madison, Wisconsin —WH-42132
40. Wake Forest University
    Winston-Salem, North Carolina —WH-44221
41. Albert Einstein College of Medicine
    New York, New York —WH-74310

* 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 inter-Agency agreement with the CDC: $4,000,000 in FY 1999 and $12,000,000 from FY 1996–98.

42. Brigham and Women's Hospital
Boston, Massachusetts —WH-74311
43. California Pacific Medical Center
San Francisco, California —WH-74312
44. Fred Hutchinson Cancer Research Center
Seattle, Washington —WH-74313
45. Fred Hutchinson Cancer Research Center
Seattle, Washington —WH-74314
46. Fred Hutchinson Cancer Research Center
Seattle, Washington —WH-74315
47. The Ohio State University
Columbus, Ohio —WH-74316
48. Tufts University
Boston, Massachusetts —WH-74317
49. University of Pittsburgh
Pittsburgh, Pennsylvania —WH-74318
50. University of California, Davis
Davis, California —WH-74319
51. University of Pittsburgh
Pittsburgh, Pennsylvania —WH-74320
52. Wake Forest University
Winston-Salem, North Carolina —WH-74321

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 2007—$5,036,653
Fiscal Years 1994–2006—$58,311,705
Total Funding to Date—$63,348,358

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. LDS Hospital
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 2007—$8,917,879
Fiscal Years 2003–2006—$33,110,894
Total Funding to Date—$42,028,773

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 2007—$5,915,840
Fiscal Years 1999–2006—$42,837,293
Total Funding to Date—$48,753,133

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 2007—$6,836,458
Fiscal Years 2003–2006—$29,793,928
Total Funding to Date—$36,630,386

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 2007—$7,216,255
Fiscal Years 2005–2006—$10,835,422
Total Funding to Date—$18,051,677

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, Georgia —HL-080543
11. National Jewish Medical and
    Research Center
    Denver Colorado —HL-080571
12. University of California, San Francisco
    San Francisco, California —HL-080685

Long-Term Oxygen Treatment Trial (LOTT), Initiated in Fiscal Year 2007

The purpose of this program is to determine the effectiveness and safety of long-term, home-administered oxygen therapy in patients with COPD. Approximately 3,500 patients with moderate COPD will be enrolled to determine whether supplemental oxygen can improve their quality of life and extend their lifespan. Research findings will help Medicare decide whether to extend coverage for home oxygen treatment for patients with moderate disease.

Obligations

Funding History:
Fiscal Year 2007—$6,208,395
Total Funding to Date—$6,208,395

Current Active Organizations and Grant Numbers

1. Brigham and Women's Hospital
   Boston, Massachusetts —HR-76183
2. Cleveland Clinic Foundation
   Cleveland, Ohio —HR-76184
3. Denver Health and Hospital Authority
   Denver, Colorado —HR-76185
4. Duke University Medical Center
   Durham, North Carolina —HR-76186
5. Kaiser Foundation Hospitals
   Portland, Oregon —HR-76187
6. Los Angeles Biomedical
   Institute/Harbor-UCLA
   Los Angeles, California —HR-76188
7. The Ohio State University
   Columbus, Ohio —HR-76189
8. Temple University
   Philadelphia, Pennsylvania —HR-76190
9. University of Alabama at Birmingham
   Birmingham, Alabama —HR-76191
10. University of Michigan
    Ann Arbor, Michigan —HR-76192
11. University of Pittsburgh
    Pittsburgh, Pennsylvania —HR-76193
12. University of Utah
    Salt Lake City, Utah —HR-76194
13. University of Washington
    Seattle, Washington —HR-76195
14. Washington University
    St. Louis, Missouri —HR-76196
15. Johns Hopkins University
    Baltimore, Maryland —HR-76197

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 2007—$237,647
Fiscal Year 2006—$1,336,159
Total Funding to Date—$1,573,806

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. University of California
San Diego, California —HD-040461
12. Duke University
Durham, North Carolina —HD-040492
13. University of Texas
Southwestern Medical Center
Dallas, Texas —HD-040689
14. University of New Mexico
Albuquerque, New Mexico —HD-053089
15. University of Iowa
Iowa City, Iowa —HD-053109
16. New England Medical Center Hospitals
Boston, Massachusetts —HD-053119
17. University of Utah
Salt Lake City, Utah —HD-053124

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 management strategies of potential benefit for children and adults undergoing blood or marrow transplantation.

Obligations

Funding History:
Fiscal Year 2007—$6,708,880
Fiscal Years 2001–2006—$36,486,721
Total Funding to Date—$43,195,601

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. National Childhood Cancer Foundation
Arcadia, California —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. University of Texas
M.D. Anderson Cancer Center
Houston, Texas —HL-069334
17. 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 2007—$3,966,000
Fiscal Years 2000–2006—$10,604,399
Total Funding to Date—$14,570,399

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 2007—$7,497,847
Fiscal Year 2006—$3,761,385
Total Funding to Date—$11,259,232

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 2007—$2,801,174
Fiscal Year 2006—$1,867,000
Total Funding to Date—$4,668,174

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 2007—$2,618,369
Fiscal Years 2000–2006—$16,787,170
Total Funding to Date—$19,405,539

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 2007—$6,407,000
Fiscal Years 2002–2006—$31,128,254
Total Funding to Date—$37,535,254

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

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 2007 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 College and University (HBCU) Research Scientist Award: Supports efforts by HBCUs 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 at the high school 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 can compete for funding for scientific research in the biomedical and behavioral sciences.

The Office of Research Training and Minority Health (ORTMH) 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 ORTMH also coordinates activities to foster greater participation of underrepresented minorities in NHLBI research and

research training and career development programs. Selected FY 2007 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 disadvantaged backgrounds and individuals with disabilities.
- Participating in HHS-Endorsed Minority Organization Internship Programs by supporting positions in NHLBI extramural and intramural divisions for students from the National Association for Equal Opportunity in Higher Education, the Hispanic Association of Colleges and Universities, the Washington Internships for Native Students programs, and the Directors of Health Promotion and Education Internship Program/CDC.
- 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 children 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 research training and career development programs, and a tour of NHLBI laboratories.
- Providing undergraduate students from the Tougaloo College Scholars program an opportunity to learn about the NIH, biomedical research, and research training opportunities at the NHLBI during a 3-day tour of the NIH.
- 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, which 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.
- Serving as the NHLBI contact for guidance to candidates applying for the NIH Pathway to Independence (PI) Award (K99/R00) and the NHLBI Career Transition Award (K22) for extramural programmatic issues.

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.

The Institute supports components of the NHANES that track the prevalence of disease and risk factors for cardiovascular and lung diseases in the U.S. population, including Hispanics and blacks (non-Hispanic).

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; one-third of participants are 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 non-cardiovascular medications (fluoroquinolone and macrolide antibiotics, antipsychotics, and antidepressants) have been shown to be proarrhythmic and thus increase the risk of sudden cardiac death. Investigators are conducting a study, using a large and comprehensive dataset of about 800,000 persons, 40 percent of whom are black, to understand the role of these medications on the risk of sudden cardiac death. Research findings are expected to provide information that will enable clinicians 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, lung function in relation to endothelial dysfunction and biomarkers, 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. (75 percent white and 25 percent black), Japanese Americans 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 individual genetic variations, 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. One project is a collaborative effort between a major academic center and minority-serving county medical center to test the efficacy and cost-effectiveness of a case-management program relative to usual care in coronary risk reduction in socioeconomically disadvantaged patients at increased risk of cardiovascular events; 63 percent of participants are Hispanics, many with low fluency in English.
- 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. Researchers are examining the complex biological, behavioral, and societal factors that result in cardiovascular health disparities in their target populations (e.g., blacks, 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, in a culturally sensitive manner, disparities in the occurrence, management, and outcomes of cardiovascular, pulmonary, hematological, and sleep disorders among various populations in the United States. The award addresses ethnic, cultural, religious, socioeconomic, linguistic, and other factors that contribute to health disparities and seeks 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, 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 pilot programs for blacks, Latinos, and Asian and Pacific Islanders 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-Pan American Health Organization/WHO Partnership to Promote Cardiovascular Health in the Americas: To develop and evaluate community-based interventions to prevent and control CVD risk

factors among low-resource communities in Argentina, Chile, and Guatemala using lay health workers (promotores de salud). Research results will be shared with country health authorities and the members of the CARMEN network: an Initiative for Integrated Prevention of Noncommunicable Diseases in the Americas.

- Honoring the Gift of Heart Health: To develop and evaluate community-based interventions to prevent and control CVD risk factors through education and outreach using tribal community health workers and community health educators.
- 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:

- *On the Move to Better Heart Health for African Americans*
- *Your Heart is Golden: Heart Health Promotion Activities for Vietnamese Communities*
- *Healthy Homes, Healthy Hearts Series*—Six easy-to-read English and Spanish booklets on heart healthy living.
- *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* 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* in Vietnamese and English
- *Honoring the Gift of Heart Health: A Heart Health Educator's Manual* directed to American Indians and Alaska Natives.

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 is 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 project focuses on Native Hawaiians and the other has a minority component:

- 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 hospital-based

echocardiography performed by professional sonographers. The project is within the Partnership Programs To Reduce Cardiovascular Disparities Initiative (see page 138).

- Heart Failure Clinical Research Network (see Chapter 9): To develop, coordinate, and conduct multiple collaborative proof-of-concept clinical protocols to improve heart failure outcomes. In 2007, the Institute expanded the Network to include a historically black medical center with minority investigators and access to a high-risk, underserved population.

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; five black families are participating. Another study is focusing on 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 to determine 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: Asians, blacks, and Mexican Americans.

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 exaggerated 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. New data from the study show genetic evidence for a more active reabsorption of sodium in this region.

Impaired sodium regulation also appears to be linked to the development of hypertension. 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 pressure. In another study, scientists are investigating the effects of stress on salt retention and measuring hormonal variables known to influence sodium regulation.

A third 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. New data suggest that obesity may contribute to the racial differences in response to stress. A study among blacks living in three different

environments (Nigeria, Jamaica, and Chicago) is examining the role of sodium and obesity in hypertension development.

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.

An investigator-initiated ancillary study to ALLHAT, the largest hypertension clinical trial conducted by the NHLBI, is evaluating the pharmacogenetic response to antihypertensive treatment and long-term clinical complications in blacks, whites, and Hispanics. Scientists are seeking to determine whether pharmacogenetics is a feasible approach to personalized therapy for hypertension.

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 disappointing. 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 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. Nearly 3,900 black patients are being enrolled in community-based projects to evaluate interventions such as pharmacy- and visiting nurses association-based approaches, telemanagement, and patient and physician education.

The Institute also supports a number of investigator-initiated studies to prevent hypertension and improve blood pressure control in ethnic and racial minorities. Interventions target both lay and medical communities. Strategies being tested include communication skill enhancement, organizational change, educational programs, lifestyle and nutritional counseling, use of technology, case management, pharmacy-based interventions, and provision of care by community health workers and other non-traditional providers.

Anger and hostility have been demonstrated as risk factors for hypertension. Scientists are evaluating an anger management intervention in a hospital setting to determine whether it will improve blood pressure and alleviate psychosocial risk factors (e.g., reduce depression); 46 percent of the participants are black.

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.

Education

The NHLBI 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:

- *Plan de Alimentación Saludable Contra la Hipertensión: Prevenir y Controlar la Presión Arterial Alta Siguiendo el Plan de Alimentación Conocida Como DASH* (DASH to the Diet: Prevent and Control High Blood Pressure Following the DASH Eating Plan)
- *Sí se Puede: Prevenir y Controlar la Presión Arterial Alta: Lo Que Usted Debe Saber Sobre la Prevention y Control de la Presión Arterial Alta* (Prevent and Control High Blood Pressure: What You Should Know)
- *Sí se Puede: Prevenir y Controlar la Presión Arterial Alta. Lo Que los Médicos Deben Saber* (Prevent and Control High Blood Pressure. What Every Physician Should Know)
- *Keep the Beat: Control Your High Blood Pressure* in English and Spanish
- *Churches as an Avenue to High Blood Pressure Control*
- *Working With Religious Congregations: A Guide for Health Professionals*
- *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 are also involved with outside activities that include designing public health interventions to address excessive stroke mortality in the Southeastern United States; publishing reports about best treatment practices to control hypertension; conducting demonstration projects at the work site and in urban and rural settings; developing reports and intervention programs regarding hypertension among special populations or situations (e.g., blacks, hypertensive patients with renal disease or diabetes, children, and older Americans); and promoting population strategies for the primary prevention of hypertension.

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 among 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 diet and blood cholesterol levels. Additional potential risk factors such as increased blood pressure, obesity, and intention to smoke, will also be monitored.

Education

The Institute has prepared the following publications on blood cholesterol for minority audiences.

- *Do You Know Your Cholesterol Levels?* in English and Spanish
- *Heart-Healthy Home Cooking African American Style*
- *Delicious Heart-Healthy Latino Recipes*
- *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

Recent NHANES data show a continued rise in the proportion of Americans who are overweight; black women are especially at risk. Results from the NHLBI Growth and Health Study (NGHS) that examined the

development of obesity and CVD risk factors in a biracial cohort of young girls 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, which 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 participants 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 (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.
- POUNDS 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.
- 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, are being 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 has prepared health information on losing excess weight for minorities.

- *Do You Need To Lose 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 among adolescent girls, from grades 6 to 8. An estimated 5,000 girls, approximately 50 percent minority, from 36 schools are participating.

An ancillary study to TAAG is investigating the influence of community characteristics (e.g., street design, access to public transportation and 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. A school-based study is evaluating the effects of vigorous exercise programs on decreasing the accretion of general and visceral adiposity in black girls. 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 the development of CVD. 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; 45 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.

- *Energize Yourself! Stay Physically Active*
- *Sí se Puede: Prevenir y Controlar la Presión Arterial Alta con Actividad Física* (Move To Prevent and Control High Blood Pressure With Physical Activity)
- *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 has also 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 of the participants 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 U.S. Food and Drug Administration for smoking cessation. 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.

- *Enjoy Living Smoke Free* 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 30 percent of the participants in the studies are 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 clinically 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; 50–60 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 predominantly 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 33 percent 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 years 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.

Education

The Institute has prepared the following publications on diabetes for minorities:

- *Protect Your Heart Against Diabetes* in English and Spanish.

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 Chapter 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: American Indians, Asians, blacks, Hispanics, and Pacific Islanders. The clinical trial recruited 12,607 minorities and the observational study recruited 15,658. Overall, of the 161,808 postmenopausal women recruited into the WHI, 17 percent were minorities.

In 2007, the Institute awarded 12 new contracts to help explain the postmenopausal hormone therapy and other clinical trial findings and to investigate the effects of genetic and biological markers on common diseases affecting postmenopausal women. Investigators will conduct their research using blood, DNA and other biological samples and clinical data from the WHI participants. Four contracts focus specifically on minority women:

- Physical Activity, Obesity, Inflammation, and CHD in a Multi-Ethnic Cohort of Women: To clarify the mechanisms underlying the reduced risk of CHD conferred by physical activity and lower body fat, beyond their effects on traditional risk factors. Using data from the WHI observational study, researchers will (1) examine the association of physical activity and inflammatory markers and determine whether the association varies by a person's weight and (2) investigate the association between physical activity combined with weight/obesity status and risk of CHD. They will compare the role of inflammatory markers in mediating the associations of physical activity combined with weight with CHD risk to the role of traditional risk factors, such as blood pressure and cholesterol levels.
- Ancestry Association Analyses of WHI Traits: To determine the contribution of ancestry informative markers in DNA samples to differences in risk of CHD, stroke, breast cancer, and hip fractures in blacks and Hispanics and analyze genetic factors related to ancestry or country of origin affecting hip fracture and bone mineral density in whites and blacks.
- Biochemical Antecedents of Fracture in Minority Women: To examine biochemical factors for fracture in minority and white women. Research results could explain differences in fracture rates and contribute to prevention strategies.
- Interaction Effects of Genes in the Inflammatory Pathway and Dietary Supplement and Medication Exposures on General Cancer Risk: To identify genetic variants in genes involved in inflammation and immunity that are associated with cancer risk (breast, colon and rectum, and lung) in whites and blacks. Scientists will test associations between the use of dietary supplements and non-steroidal anti-inflammatory drugs (NSAID) with inflammatory markers and risk of overall cancer. They will then study interaction effects of genetic variants with dietary supplement and NSAID exposure on cancer risk.

Lung Diseases

The NHLBI supports research on a number of lung diseases, such as asthma, sarcoidosis, and TB, that disproportionately affect minorities. The following section provides examples of research to address health disparities of lung diseases among minority populations; selected sleep disorders are also included.

Asthma

Etiology and Pathophysiology

The NHLBI has initiated several studies to determine the etiology and pathophysiology of asthma.

- 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.
- Genome-Wide Association Studies To Identify Genetic Components Related to Heart, Lung, and Blood Disorders: To identify genetic variants related to heart, lung, and blood disorders and their risk factors using existing population, family, and clinical studies. Several of the asthma-related projects have strong minority representation in the study populations.

The Institute also supports investigator-initiated projects on the etiology and pathophysiology of asthma. They include a study 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; a study to establish the link between specific genotypic variants and phenotypic markers, and to elucidate the immunological pathways that contribute to asthma severity in blacks; and a case-controlled study 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 them, 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 to assess population stratification.

Other projects that focus on Hispanic populations include one that uses genomic screening to search for the genetic basis of asthma in a homogeneous Hispanic population in Costa Rica and another that involves a population-based case control association study to examine the influence of genetic and environmental factors on the development and severity of asthma in Puerto Rican children.

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 study population are from minority populations.

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 11): 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 minorities. 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 minorities. 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 an Internet-based self-management program 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 Institute has developed easy-to-read materials on asthma treatment and control directed to English and Spanish audiences with low literacy.

- *Facts About Controlling Your Asthma*
- *El Asma: Cómo Controlar Esta Enfermedad* (Facts About Controlling Your Asthma)

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 57 percent black participation and another has 37 percent Asian 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 American Indians, Asians, blacks, and Hispanics. 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 awareness of sleep disorders.

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; 25 percent of the participants are minorities.

An investigator-initiated study is underway to assess whether sleep apnea in children can be effectively treated using tonsillectomy; 50 percent of the participants will be black.

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 antituberculosis 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 studies are being conducted among patients from minority populations. Included among them are studies to compare susceptibility to TB in populations in Mexico and Peru; examine the role of interferon-gamma in the pathogenesis of TB among Hispanics with and without HIV; identify and characterize host factors that predispose Asians to develop TB; and 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.

A third program, directed toward public health workers, could affect the health of minority populations, where rates for TB are disproportionately high. Scientists are evaluating the effectiveness of a new TB contact priority model for investigating contacts of persons with infectious TB. An effective model could enhance contact investigations and provide more efficient TB disease control.

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 available 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, identify better approaches for its diagnosis and treatment, and prevent complications.

Basic and translational research currently focuses on gaining an improved understanding of 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.
- Pulmonary Complications of Sickle Cell Disease: To stimulate collaborative translational research on the pulmonary complications of SCD. Researchers in hematology and pulmonary science, using a combination of basic and clinical approaches, will investigate the major known pulmonary complications of SCD due to acute chest syndrome, pulmonary hypertension, and oxyhemoglobin desaturation.

Two trans-NHLBI initiatives support research in SCD:

- Genome-Wide Association Studies To Identify Genetic Components That Relate to Heart, Lung, and Blood Diseases (see page 51): To investigate common genes involved in subphenotypes of SCD and centenarians. Scientists are seeking to identify genetic associations with specific clinical features in the two populations and subsequently compare the two datasets for differences and similarities. Research results could lead to improved treatment for SCD and increase our understanding of the genetic components that enhance healthy aging.
- Ancillary Studies in Clinical Trials (see page 50): To identify genetic variations underlying Rh antigenic diversity in patients with SCD. Research findings will be used to develop high throughput microchips with which to screen for matching donors and recipients prior to blood transfusion. Knowledge of the genetic basis for compatibility between donors and SCD patients for transfusion could contribute to preventing alloimmunization and improve SCD patient care.

Basic research advances reported in FY 2007 include:

- Confirmation in a sickle cell mouse model of the link between pulmonary hypertension, hemolysis, and the nitric oxide pathway. The model will allow for the study of pulmonary vasculature during different stages of development, providing opportunities for testing of hypotheses related to development of pulmonary hypertension, a common complication of SCD associated with early mortality. It will facilitate the evaluation of future therapies to prevent or combat pulmonary hypertension.
- Identification of genetic risk factors for priapism in adults with SCD. Using single-nucleotide polymorphisms, researchers found four genes important in cell adhesion, inflammation, cell signaling, or coagulation that are highly correlated with this painful condition. Finer analyses of these genetic factors may lead to a greater understanding of the risk conferred by individual gene variants or groups of such variants.

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, the 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 overt stroke.
- 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 such programs as the NHLBI Comprehensive Sickle Cell Centers Program.
- Sildenafil for Sickle Cell Disease-Associated Pulmonary Hypertension (see Chapter 11): To test the effects of 16 weeks of chronic sildenafil therapy on exercise endurance and pulmonary artery pressure in patients ages 14 years 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 minorities. 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 2007 include:

- Sickle Cell Disease Health-Related Quality of Life Questionnaire Project: To develop and validate an instrument to measure health-related quality of life among adults with SCD.
- Working Group on the Neurobiology of Pain and the Pharmacogenetics of Opioids in Sickle Cell Disease: To stimulate studies that will investigate the nature of pain syndromes in patients with SCD and encourage the inclusion of SCD patients in non-disease specific protocols.
- Thirty-Fifth Anniversary Meeting of the National Sickle Cell Disease Program/Sickle Cell Disease Association of America: To discuss the latest scientific advances by leading researchers and the effects of SCD on patients and on their families and communities.
- A conference grant to examine best practices in transfusion medicine for patients with SCD: To develop recommendations for the appropriate use of red blood cells in SCD patients and to devise strategies to facilitate awareness, acceptance, and implementation of best practices among providers and patients.

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

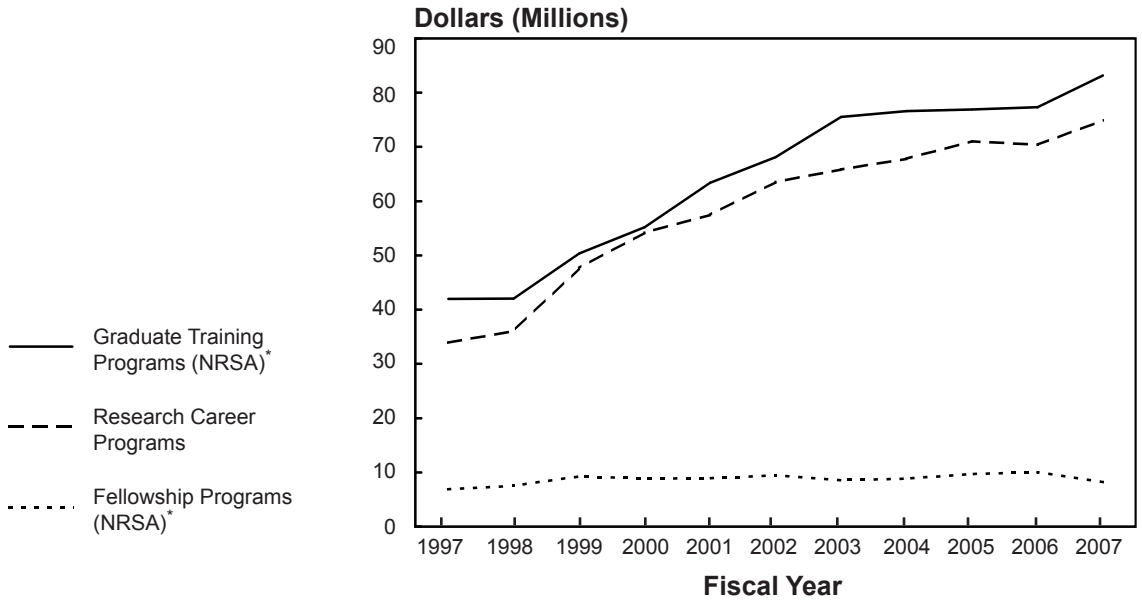
Cooley's anemia is an inherited disorder of red blood cells that affects primarily people of African, Asiatic Indian, Chinese, Mediterranean, and Southeast Asian origin. In 2000, the Institute initiated a program to establish a network of clinical research centers to evaluate new therapeutic agents. 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 established.

- 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.

An important advance in the area of basic research involves the recent identification of the processes by which oxidative stress affects the regulation of red cell maturation and lifespan—a finding that affects our understanding of central pathophysiologic processes in thalassemia. When considered with the ongoing work in the Thalassemia Clinical Research Network, which is elucidating oxidative stress responses and effects of iron chelation therapy in patients with thalassemia, this work promises to provide insight into possible targets for intervention.

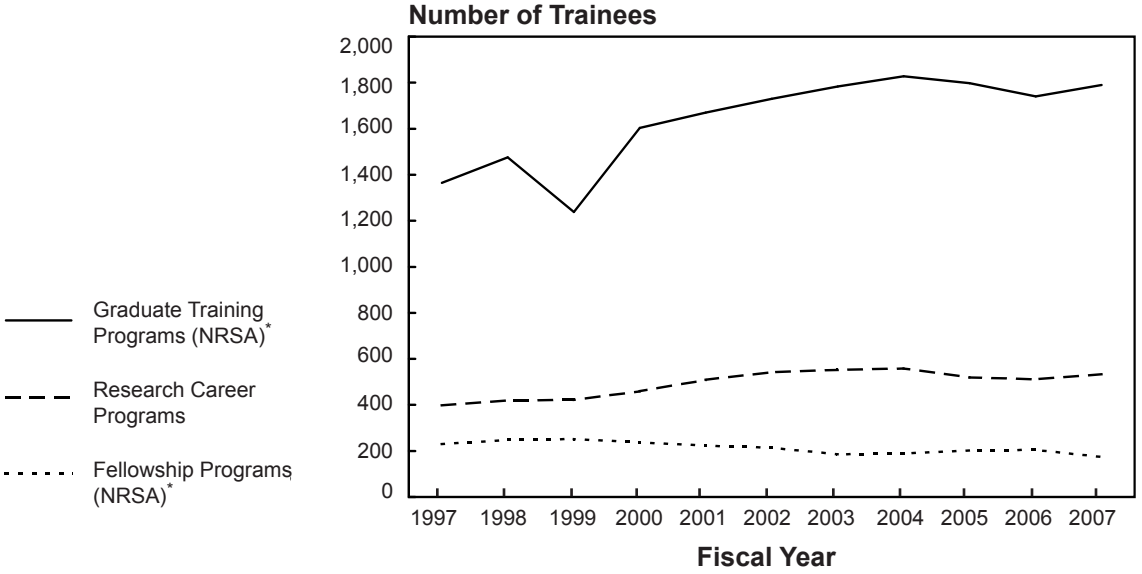
13. Research Training and Career Development Programs

NHLBI Research Training and Career Development Obligations: Fiscal Years 1997–2007



* National Research Service Awards (NRSA).

NHLBI Full-Time Training Positions: Fiscal Years 1997–2007



* 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 2007

	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)	44	44	$ 1,508,674	$ —	$ 1,508,674	1.7%
Individual NRSA (F32)	130	130	6,684,654	—	6,684,654	7.3
Senior Fellowships NRSA (F33)	—	—	—	—	—	0.0
Subtotal, Fellowships	174	174	8,193,328	—	8,193,328	9.0
Graduate Training Programs						
Institutional NRSA (T32)	216	—	72,762,520	5,580,035	78,342,555*	85.6
Minority Institutional NRSA (T32)	4	—	725,148	54,836	779,984	0.9
Off-Quarter Professional Student Training NRSA (T34, T35)	17	—	2,222,758	188,701	2,411,459	2.6
Short-Term Training for Minority Students (T35M)	22	—	1,512,274	160,594	1,672,868	1.8
Subtotal, Graduate Training Programs	259	—	77,222,700	5,984,166	83,206,866*	91.0
Total, Training Programs	**433**	**174**	**$85,416,028**	**$5,984,166**	**$91,400,194***	**100.0%**

* Excludes assessment of $1,916,000,000.

History of Training Obligations by Activity: Fiscal Years 1997–2007

Dollars (Thousands)

	Fiscal Year										
	1997	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Fellowship Programs											
Predoctoral Fellowship Award (F31)	$ 388	$ 466	$ 346	$ 248	$ 264	$ 478	$ 563	$ 549	$ 794	$ 1,202	$ 1,509
Individual NRSA (F32)	6,281	6,969	8,807	8,517	8,515	8,887	7,868	8,128	8,813	8,790	6,684
Senior Fellowships NRSA (F33)	179	125	90	92	147	84	112	144	58	53	—
Subtotal, Fellowships	6,848	7,560	9,243	8,857	8,926	9,449	8,543	8,821	9,665	10,045	8,193
Graduate Training Programs											
Institutional NRSA (T32)	38,253[A]	37,904[B]	45,551[C]	50,507[D]	58,516[E]	62,999[F]	69,951[G]	71,229[H]	70,524[I]	71,831[J]	78,343[K]
Minority Institutional NRSA (T32)	898	706	901	1,167	996	1,092	1,006	734	1,184	743	780
Off-Quarter Professional Student Training NRSA (T34, T35)	1,216	1,435	1,384	966	1,974	1,987	1,975	1,993	2,233	2,215	2,411
MARC (T36)	5	5	5	5	5	—	—	—	—	—	—
Short-Term Training for Minority Students (T35M)	1,612	1,964	2,494	2,570	1,877	2,057	2,594	2,671	2,976	2,527	1,673
Subtotal, Training Grants	41,984	42,014	50,335	55,215	63,368	68,135	75,526	76,627	76,917	77,316	83,207
Total, Training Programs	**$48,832[A]**	**$49,574[B]**	**$59,578[C]**	**$64,072[D]**	**$72,294[E]**	**$77,584[F]**	**$84,069[G]**	**$85,448[H]**	**$86,582[I]**	**$87,361[J]**	**$91,400[K]**

A Excludes Assessment of $1,004,000.
B Excludes Assessment of $1,032,000.
C Excludes Assessment of $1,216,000.
D Excludes Assessment of $1,280,000.
E Excludes Assessment of $1,424,000.
F Excludes Assessment of $1,584,000.
G Excludes Assessment of $1,716,000.
H Excludes Assessment of $1,744,000.
I Excludes Assessment of $1,764,000.
J Excludes Assessment of $1,818,000.
K Excludes Assessment of $1,916,000.

Full-Time Training Positions by Activity: Fiscal Years 1997–2007

	Number of Positions										
	Fiscal Year										
	1997	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Fellowship Programs											
Predoctoral Fellowship Award (F31)	15	19	13	11	12	18	19	18	25	32	44
Individual NRSA (F32)	210	225	237	225	208	194	164	168	176	171	130
Senior Fellowships NRSA (F33)	5	4	2	2	3	2	2	3	1	2	—
Subtotal, Fellowships	230	248	252	238	223	214	185	189	202	205	174
Graduate Training Programs											
Institutional NRSA (T32)	1,179	1,423	1,185	1,368	1,425	1,482	1,542	1,578	1,540	1,512	1,585
Minority Institutional NRSA (T32)	43	52	53	48	43	39	42	32	35	26	23
Off-Quarter Professional Student Training NRSA (T34, T35)	68	—	—	51	109	179	93	99	95	104	105
Short-Term Training for Minority Students (T35M)	75	—	—	136	93	30	107	119	128	99	77
Subtotal, Training Grants	1,365	1,475	1,238	1,603	1,670	1,730	1,784	1,828	1,798	1,741	1,790
Total, Training Positions	**1,595**	**1,723**	**1,490**	**1,841**	**1,893**	**1,944**	**1,969**	**2,017**	**2,000**	**1,946**	**1,964**

NHLBI Research Career Programs: Fiscal Years 1997–2007

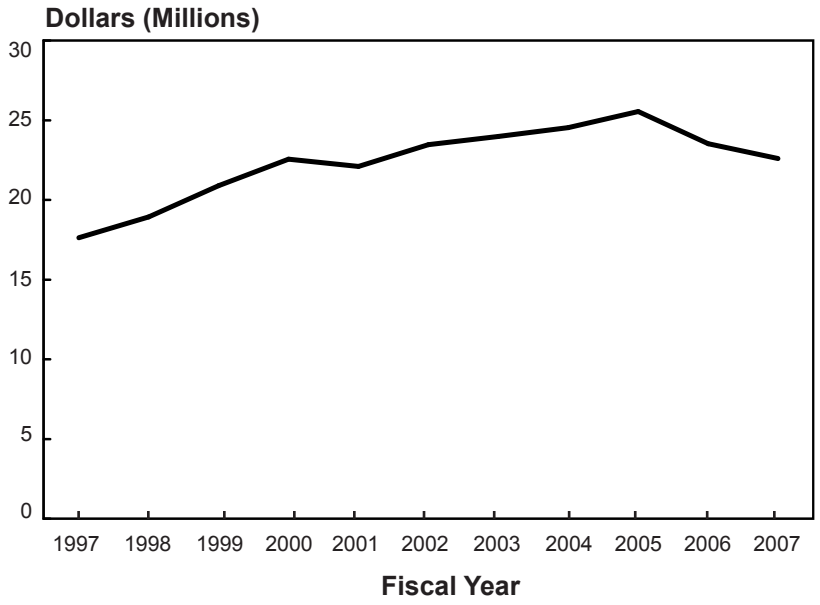
	Number of Awards										
	Fiscal Year										
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Mentored Research Scientist Development Award for Minority Faculty (K01)	5	19	30	29	44	54	47	46	45	40	35
Minority Institution Faculty Mentored Research Scientist Development Award (K01)	1	—	—	11	9	2	7	6	4	4	5
Mentored Scientist Development Award in Research Ethics (K01)	—	—	—	—	—	—	2	2	3	3	3
Independent Scientist Award (K02)	8	14	18	27	34	33	32	31	32	24	25
Research Career Development Award (K04)	18	10	6	1	—	—	—	—	—	—	—
Research Career Award (K06)	3	3	2	2	2	2	2	1	1	1	—
Systemic Pulmonary and Vascular Disease Academic Award (K07)	9	3	3	1	—	—	—	—	—	—	—
Asthma Academic Award (K07)	9	6	3	—	—	—	—	—	—	—	—
Tuberculosis Academic Award (K07)	23	20	13	9	5	—	—	—	—	—	—
Sleep Academic Award (K07)	12	20	20	20	12	8	—	—	—	—	—
Nutrition Academic Award (K07)	—	10	10	19	19	19	9	9	—	—	—
Pediatric Transfusion Medicine Academic Award (K07)	—	—	—	—	—	—	—	—	—	—	4
Cultural Competence and Health Disparities Academic Award (K07)	—	—	—	—	—	—	—	8	14	18	18
Clinical Investigator Development Award (K08)	267	278	262	257	241	236	240	229	239	226	214
Physician Scientist Award (K11)	—	—	—	—	—	—	—	—	—	—	—
Vascular Medicine Research Career Development Program (K12)	—	—	—	—	—	—	—	—	—	2	7
Clinical Hematology Research Career Development Program (K12)	—	—	—	—	—	—	—	—	—	6	6
Genetics and Genomics of Lung Diseases Career Development Program (K12)	—	—	—	—	—	—	—	—	—	—	8
Minority School Faculty Development Award (K14)	9	—	—	4	1	—	—	—	—	—	—
Research Development Award for Minority Faculty(K14)	34	37	22	7	—	—	—	—	—	—	—
Career Enhancement Award for Stem Cell Research (K18)	—	—	—	—	—	—	1	5	3	2	4
NHLBI Career Transition Award (K22)	—	—	—	—	—	—	—	1	2	1	1
Mentored Patient-Oriented Research Career Development Award (K23)	—	—	13	36	58	90	110	122	127	122	120
Midcareer Investigator Award in Patient-Oriented Research (K24)	—	—	11	20	27	37	38	32	32	33	29
Mentored Quantitative Research Career Development Award (K25)	—	—	—	—	2	7	9	12	17	16	15
Clinical Research Curriculum Award (K30)	—	—	9	16	55	55	55	55	—*	14	16
Career Transition Award (K99)	—	—	—	—	—	—	—	—	—	—	24
Total, Research Career Programs	**398**	**420**	**422**	**459**	**509**	**543**	**552**	**559**	**519**	**512**	**534**

* 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 1997–2007

	Dollars (Thousands)										
	Fiscal Year										
	1997	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
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	$ 4,718
Minority Institution Faculty Mentored Research Scientist Development Award (K01)	106	101	905	1,300	1,143	1,703	991	867	588	567	698
Mentored Scientist Development Award in Research Ethics (K01)	—	—	—	—	—	—	255	253	355	358	357
Independent Scientist Award (K02)	545	933	1,548	2,350	3,202	3,130	3,099	3,079	3,218	2,421	2,511
Research Career Development Award (K04)	1,226	684	568	69	—	—	—	—	—	—	—
Research Career Award (K06)	103	103	70	70	70	69	69	34	34	34	—
Systemic Pulmonary and Vascular Diseases Academic Award (K07)	1,415	386	423	113	—	—	—	—	—	—	—
Asthma Academic Award (K07)	764	509	248	—	—	—	—	—	—	—	—
Tuberculosis Academic Award(K07)	1,831	1,566	1,161	745	396	—	—	—	—	—	—
Sleep Academic Award (K07)	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	—	—	—
Pediatrics Transfusion Medicine Academic Award (K07)	—	—	—	—	—	—	—	—	—	—	486
Cultural Competence and Health Disparities Academic Award (K07)	—	—	—	—	—	—	—	925	1,620	2,109	2,232
Clinical Investigator Development Award (K08)	22,238	23,122	29,741	30,189	29,263	29,295	30,288	29,037	30,429	28,973	27,286
Physician Scientist Award (K11)	—	—	—	—	—	—	—	—	—	—	—
Vascular Medicine Research Career Development Program (K12)	—	—	—	—	—	—	—	—	—	772	3,206
Clinical Hematology Research Career Development Program (K12)	—	—	—	—	—	—	—	—	—	2,360	2,367
Genetics and Genomics of Lung Diseases Career Development Program (K12)	—	—	—	—	—	—	—	—	—	—	3,154
Minority School Faculty Development Award (K14)	729	618	445	862	98	—	—	—	—	—	—
Research Development Award for Minority Faculty (K14)	3,468	3,099	2,093	393	—	—	—	—	—	—	—
Career Enhancement Award for Stem Cell Research (K18)	—	—	—	—	—	—	243	980	512	213	652
NHLBI Career Transition Award (K22)	—	—	—	—	—	—	—	185	364	178	160
Mentored Patient-Oriented Research Career Development Award (K23)	—	—	1,687	4,619	7,570	11,909	14,571	16,216	17,086	16,720	16,419
Midcareer Investigator Award in Patient-Oriented Research (K24)	—	—	1,054	2,072	2,877	4,058	4,368	3,815	3,929	4,315	4,037
Mentored Quantitative Research Career Development Award (K25)	—	—	—	—	272	921	1,195	1,622	2,206	2,184	2,077
Clinical Research Curriculum Award (K30)	—	—	1,772	3,163	3,073	3,090	3,110	3,115	4,589	3,708	2,520
Career Transition Award (K99)	—	—	—	—	—	—	—	—	—	—	2,074
Total, Research Career Program Obligations	**$33,912**	**$36,069**	**$47,669**	**$54,184**	**$57,470**	**$63,514**	**$65,817**	**$67,794**	**$71,018**	**$70,365**	**$74,954**

NHLBI Minority Biomedical Research Training, Career Development, and Research Supplements Program Obligations: Fiscal Years 1997–2007



NHLBI Minority Biomedical Research Training, Career Development, and Research Supplements Program Obligations: Fiscal Years 1997–2007

	Dollars (Thousands)										
	Fiscal Year										
	1997	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
MARC Summer Research Training Program	$ 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	4,718
MARC	5	5	—	5	5	—	—	—	—	—	—
Minority Biomedical Research Support (MBRS)	2,722	2,978	3,423	3,873	3,165	2,793	3,600	2,806	2,846	2,403	2,475
Minority Institution Faculty Mentored Research Scientist Development Award	106	101	905	1,300	1,143	1,703	991	867	588	567	698
Minority Institution Research Training Program	898	706	901	1,167	996	1,092	1,006	734	1,184	743	780
Minority Predoctoral Fellowship	388	436	345	248	264	278	308	374	545	1,012	1,115
Minority Research Supplements Program	7,070	7,043	7,440	8,304	8,587	9,822	9,323	10,938	11,214	10,680	10,834
Minority School Faculty Development Award	729	618	445	862	98	—	—	—	—	—	—
Reentry Supplements	152	249	106	176	384	—	—	—	96	132	245
Research Development Award for Minority Faculty	3,468	3,099	2,093	393	—	—	—	—	—	—	—
Short-Term Training for Minority Students	1,612	1,964	2,494	2,570	1,876	2,057	2,594	2671	2,976	2,526	1,673
Total, Minority Programs	**$17,627**	**$18,922**	**$20,900**	**$22,552**	**$22,094**	**$23,471**	**$23,982**	**$24,540**	**$25,537**	**$23,516**	**$22,538**

NHLBI Research Supplements Program by Award Type: Fiscal Years 1997–2007

Number of Awards

	Fiscal Year										
	1997	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Minority Supplements											
Investigator	38	31	32	33	33	46	47	35	29	27	31
Postdoctoral	47	50	47	42	41	33	38	37	52	49	43
Graduate	36	48	53	47	43	45	57	61	80	74	73
Undergraduate	23	25	17	19	12	17	18	17	12	11	16
High School	9	11	6	—	3	3	4	3	7	3	3
Post-Master/Post-Baccalaureate	—	—	—	—	—	2	8	17	16	11	4
Reentry Supplements	2	3	2	1	3	—	—	3	2	1	1
Disability Supplements	3	2	1	5	4	5	4	3	2	2	4
Total, Research Supplements Program	**158**	**170**	**158**	**147**	**139**	**151**	**176**	**176**	**200**	**178**	**175**

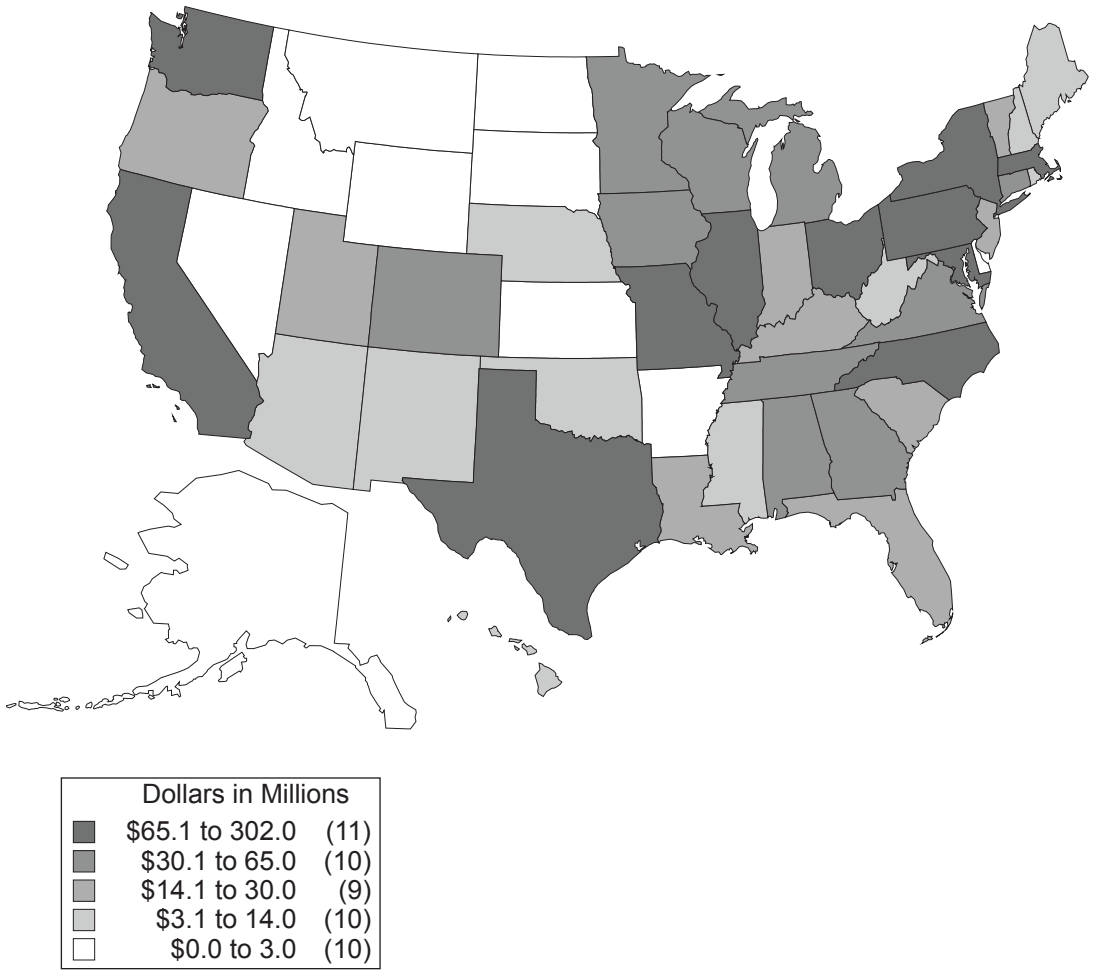
NHLBI Research Supplements Program Obligations by Award Type: Fiscal Years 1997–2007

Dollars (Thousands)

	Fiscal Year										
	1997	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Minority Supplements											
Investigator	$2,412	$2,185	$2,331	$3,262	$3,430	$ 5,046	$3,844	$ 4,256	$ 3,552	$ 3,343	$ 3,719
Postdoctoral	3,172	3,032	3,110	3,053	3,086	2,554	2,655	2,713	3,432	3,542	3,284
Graduate	1,181	1,527	1,806	1,791	1,818	1,864	2,181	2,439	3,208	3,114	3,021
Undergraduate	273	246	166	198	235	260	301	282	179	178	350
High School	32	53	27	—	18	33	33	13	30	18	16
Post-Master/Post-Baccalaureate	—	—	—	—	—	65	309	597	618	352	156
Reentry Supplements	152	249	106	176	384	—	—	495	96	132	245
Disability Supplements	165	96	72	282	187	474	360	143	99	133	288
Total, Research Supplements Program	**$7,387**	**$7,388**	**$7,618**	**$8,762**	**$9,158**	**$10,296**	**$9,683**	**$10,938**	**$11,214**	**$10,812**	**$11,079**

14. Geographic Distribution of Awards: Fiscal Year 2007

Geographic Distribution of Awards by State: Fiscal Year 2007



Geographic Distribution of Awards by State or Country: Fiscal Year 2007

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Alabama								
CFD Research Corporation	1	$ 459,692	1	$ 459,692	—	$ —	—	$ —
Cooper Green Hospital	1	549,756	1	549,756	—	—	—	—
Elgavish Paramagnetics, Inc.	1	380,811	1	380,811	—	—	—	—
ResearchSouth, Inc.	1	459,332	1	459,332	—	—	—	—
University of Alabama at Birmingham	66	30,899,244	55	26,297,758	7	1,318,079	4	3,283,407
University of South Alabama	13	4,597,066	11	4,369,017	2	228,049	—	—
Total Alabama	**83**	**37,345,901**	**70**	**32,516,366**	**9**	**1,546,128**	**4**	**3,283,407**
Alaska								
Norton Sound Health Corporation	1	485,496	1	485,496	—	—	—	—
Total Alaska	**1**	**485,496**	**1**	**485,496**	**—**	**—**	**—**	**—**
Arizona								
Arizona State University, Tempe Campus	2	390,354	2	390,354	—	—	—	—
ImaRx Therapeutics, Inc.	1	303,669	1	303,669	—	—	—	—
Mayo Clinic, Arizona	3	474,363	1	365,049	2	109,314	—	—
Northern Arizona University	1	222,000	1	222,000	—	—	—	—
Translational Genomics Research Institute	2	774,373	2	774,373	—	—	—	—
University of Arizona	32	9,680,245	28	8,879,296	4	800,949	—	—
Western Research Company, Inc.	1	426,322	1	426,322	—	—	—	—
Total Arizona	**42**	**12,271,326**	**36**	**11,361,063**	**6**	**910,263**	**—**	**—**
Arkansas								
University of Arkansas for Medical Sciences, Little Rock	6	1,865,701	6	1,865,701	—	—	—	—
Total Arkansas	**6**	**1,865,701**	**6**	**1,865,701**	**—**	**—**	**—**	**—**
California								
Activesite Pharmaceuticals, Inc.	1	224,868	1	224,868	—	—	—	—
Advanced Brain Monitoring, Inc.	1	41,250	1	41,250	—	—	—	—
AfaScience, Inc.	1	232,068	1	232,068	—	—	—	—
Affymetrix, Inc.	1	9,172,820	—	—	—	—	1	9,172,820
Apneos Corporation	1	107,000	1	107,000	—	—	—	—
BioTechPlex Corporation	2	735,205	2	735,205	—	—	—	—
Blood Systems Research Institute	4	3,471,596	3	1,995,326	—	—	1	1,476,270
Burnham Institute for Medical Research	8	5,755,853	8	5,755,853	—	—	—	—
California Institute of Technology	5	1,960,443	4	1,908,395	1	52,048	—	—
California Pacific Medical Center Research Institute	3	1,402,213	2	892,408	—	—	1	509,805
California State Polytechnic University, Pomona	—	161,889	—	161,889	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
California State University, San Bernardino	—	60,612	—	60,612	—	—	—	—
Cedars-Sinai Medical Center	6	5,791,717	6	5,791,717	—	—	—	—
Children's Hospital and Research Center at Oakland	15	8,730,852	13	8,262,618	1	108,427	1	359,807
Children's Hospital Los Angeles	10	6,484,574	10	6,484,574	—	—	—	—
Children's Hospital of Orange County	1	44,187	—	—	1	44,187	—	—
City of Hope/Beckman Research Institute	3	924,478	3	924,478	—	—	—	—
Cytograft Tissue Engineering, Inc.	1	728,532	1	728,532	—	—	—	—
Cytori Therapeutics, Inc.	1	249,877	1	249,877	—	—	—	—
Diagnostics for the Real World, Ltd.	1	1,540,147	1	1,540,147	—	—	—	—
Fallbrook Engineering, Inc.	1	958,277	1	958,277	—	—	—	—
FibroGen, Inc.	1	497,166	1	497,166	—	—	—	—
HeartVista, Inc.	1	132,355	1	132,355	—	—	—	—
Inner Health, Inc.	1	99,977	1	99,977	—	—	—	—
J. David Gladstone Institutes	8	3,837,067	8	3,837,067	—	—	—	—
Kaiser Foundation Research Institute	10	7,932,367	8	7,075,103	—	—	2	857,264
Keck Graduate Institute of Applied Life Sciences	1	359,123	1	359,123	—	—	—	—
LA Biomedical Research Institute/Harbor-UCLA Medical Center	10	2,968,598	7	2,438,156	—	—	3	530,442
La Jolla Bioengineering Institute	3	1,264,229	3	1,264,229	—	—	—	—
La Jolla Institute for Molecular Medicine	2	982,569	2	982,569	—	—	—	—
LaunchPoint Technologies, Inc.	2	455,230	2	455,230	—	—	—	—
LDM Associates	1	587,910	1	587,910	—	—	—	—
LifeWave, Inc.	1	147,019	1	147,019	—	—	—	—
Loma Linda University	4	1,061,572	3	1,003,232	1	58,340	—	—
Los Angeles Orthopaedic Foundation	1	329,731	1	329,731	—	—	—	—
MagneSensors, Inc.	1	189,254	1	189,254	—	—	—	—
March of Dimes Birth Defects Foundation	1	308,926	1	308,926	—	—	—	—
National Childhood Cancer Foundation	1	1	1	1	—	—	—	—
Northern California Institute Research and Education	9	3,919,892	9	3,919,892	—	—	—	—
Palo Alto Institute for Research and Education, Inc.	2	659,892	2	659,892	—	—	—	—
Rand Corporation	4	2,547,760	4	2,547,760	—	—	—	—
Regents of the University of California	1	855,331	—	—	—	—	1	855,331
Salk Institute for Biological Studies	2	978,906	2	978,906	—	—	—	—
San Diego State University	14	11,217,113	11	6,605,276	2	58,344	1	4,553,493
Science Applications International Corporation	1	3,008,000	—	—	—	—	1	3,008,000
Scripps Research Institute	27	15,714,794	26	15,250,551	1	464,243	—	—
Sidney Kimmel Cancer Center	1	755,456	1	755,456	—	—	—	—
Stanford University	70	28,582,377	57	24,992,882	12	1,759,034	1	1,830,461
Tissue Repair Company	1	1,013,914	1	1,013,914	—	—	—	—
Torrey Pines Institute for Molecular Studies	2	832,594	2	832,594	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
University of California, Berkeley	10	3,344,784	7	3,204,601	3	140,183	—	—
University of California, Davis	31	10,446,232	28	9,338,160	2	423,148	1	684,924
University of California, Irvine	21	6,983,500	19	6,796,198	1	48,796	1	138,506
University of California, Lawrence Berkeley National Laboratory	8	5,735,442	7	5,497,600	1	237,842	—	—
University of California, Los Angeles	74	36,213,941	65	33,855,480	8	1,614,295	1	744,166
University of California, Riverside	1	350,493	1	350,493	—	—	—	—
University of California, San Diego	79	39,022,747	70	35,888,592	9	3,134,155	—	—
University of California, San Francisco	107	41,012,876	96	38,737,692	10	1,937,073	1	338,111
University of California, Santa Barbara	3	904,902	3	904,902	—	—	—	—
University of California, System Office/ President	—	2,000	—	2,000	—	—	—	—
University of California, Merced	1	40,972	—	—	1	40,972	—	—
University of Southern California	27	13,136,569	26	13,095,298	1	41,271	—	—
Vala Sciences, Inc.	1	676,969	1	676,969	—	—	—	—
Veterans Medical Research Foundation of San Diego	4	3,165,966	4	3,165,966	—	—	—	—
Virogenics, Inc.	1	149,881	1	149,881	—	—	—	—
Total California	**617**	**301,204,855**	**545**	**265,983,097**	**55**	**10,162,358**	**17**	**25,059,400**
Colorado								
Aerophase, Inc.	1	591,751	1	591,751	—	—	—	—
Colorado State University, Fort Collins	5	904,573	5	904,573	—	—	—	—
Denver Health and Hospital Authority	3	1,684,130	2	1,385,761	—	—	1	298,369
Freyr Biosystems, LLC	1	101,942	1	101,942	—	—	—	—
Kestrel Labs, Inc.	1	999,855	1	999,855	—	—	—	—
Keystone Symposia	4	50,000	4	50,000	—	—	—	—
Klein Buendel, Inc.	1	479,697	1	479,697	—	—	—	—
National Jewish Medical and Research Center	26	19,244,878	25	19,227,446	1	17,432	—	—
PHCC, LP	1	145,970	1	145,970	—	—	—	—
Rocky Mountain Biosystems, Inc.	1	497,308	1	497,308	—	—	—	—
Sporian Microsystems, Inc.	1	99,995	1	99,995	—	—	—	—
Synkera Technologies, Inc.	1	186,020	1	186,020	—	—	—	—
University of Colorado	1	316,335	—	—	—	—	1	316,335
University of Colorado at Boulder	8	2,060,315	7	1,942,835	1	117,480	—	—
University of Colorado at Denver and Health Science Center, Aurora	50	20,620,242	44	18,706,584	6	1,913,658	—	—
University of Colorado, Denver	1	360,397	—	—	—	—	1	360,397
ValveXchange, Inc.	1	247,873	1	247,873	—	—	—	—
Total Colorado	**107**	**48,591,281**	**96**	**45,567,610**	**8**	**2,048,570**	**3**	**975,101**
Connecticut								
Gaylord Hospital	1	164,504	1	164,504	—	—	—	—
Hartford Hospital	1	904,825	1	904,825	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
John B. Pierce Laboratory, Inc.	1	553,725	1	553,725	—	—	—	—
Protein Sciences Corporation	1	487,336	—	—	—	—	1	487,336
SibTech, Inc.	1	187,130	1	187,130	—	—	—	—
University of Connecticut School of Medicine and Dental Medicine	11	3,662,311	11	3,662,311	—	—	—	—
University of Connecticut Storrs	2	549,271	2	549,271	—	—	—	—
Yale University	64	33,994,814	55	29,152,631	8	2,443,269	1	2,398,914
Total Connecticut	**82**	**40,503,916**	**72**	**35,174,397**	**8**	**2,443,269**	**2**	**2,886,250**
Delaware								
University of Delaware	4	1,253,409	4	1,253,409	—	—	—	—
Total Delaware	**4**	**1,253,409**	**4**	**1,253,409**	**—**	**—**	**—**	**—**
District of Columbia								
Academy for Educational Development	1	1,235,625	—	—	—	—	1	1,235,625
American Institutes for Research	5	5,451,630	—	—	—	—	5	5,451,630
American Society of Hematology	1	10,000	1	10,000	—	—	—	—
Association of Professors of Medicine	1	25,500	1	25,500	—	—	—	—
Children's Research Institute	5	2,246,779	4	1,593,211	—	—	1	653,568
George Washington University	9	2,853,744	8	2,797,042	1	56,702	—	—
Georgetown University	12	5,482,908	11	5,427,010	1	55,898	—	—
Hager Sharp, Inc.	1	604,526	—	—	—	—	1	604,526
Howard University	7	2,931,183	4	2,543,377	1	1	2	387,805
U.S. Bureau of the Census	1	193,000	—	—	—	—	1	193,000
U.S. Office of Personnel Management	1	725,000	—	—	—	—	1	725,000
Total District of Columbia	**44**	**21,759,895**	**29**	**12,396,140**	**3**	**112,601**	**12**	**9,251,154**
Florida								
Altor BioScience Corporation	1	1,042,563	1	1,042,563	—	—	—	—
ArchieMD, Inc.	1	137,819	1	137,819	—	—	—	—
Florida Institute of Technology	1	306,144	1	306,144	—	—	—	—
Florida International University	—	404,921	—	404,921	—	—	—	—
H. Lee Moffitt Cancer Center and Research Institute	2	554,440	2	554,440	—	—	—	—
Mount Sinai Medical Center, Miami Beach	1	4,086,877	1	4,086,877	—	—	—	—
Nemours Children's Clinic	1	160,163	1	160,163	—	—	—	—
University of Central Florida	2	429,207	2	429,207	—	—	—	—
University of Florida	32	9,953,177	27	9,496,864	5	456,313	—	—
University of Miami Coral Gables	5	8,873,036	2	3,004,837	1	318,865	2	5,549,334
University of Miami School of Medicine	13	4,445,301	9	3,340,727	2	431,773	2	672,801
University of South Florida	2	616,815	2	616,815	—	—	—	—
Total Florida	**61**	**31,010,463**	**49**	**23,581,377**	**8**	**1,206,951**	**4**	**6,222,135**

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Georgia								
Emory University	56	20,630,976	51	19,196,825	4	787,142	1	647,009
Georgia Institute of Technology	6	2,528,894	6	2,528,894	—	—	—	—
Medical College of Georgia	28	10,031,336	25	9,549,373	3	481,963	—	—
Morehouse School of Medicine	12	4,164,258	11	3,784,437	1	379,821	—	—
Transfusion and Transplantation Technologies	1	262,778	1	262,778	—	—	—	—
U.S. Centers for Disease Control and Prevention	5	3,375,000	—	—	—	—	5	3,375,000
University of Georgia	2	219,043	1	168,615	1	50,428	—	—
Zygogen, LLC	1	153,994	1	153,994	—	—	—	—
Total Georgia	**111**	**41,366,279**	**96**	**35,644,916**	**9**	**1,699,354**	**6**	**4,022,009**
Hawaii								
Pacific Health Research Institute	1	516,908	1	516,908	—	—	—	—
Queen's Medical Center	1	568,909	1	568,909	—	—	—	—
University of Hawaii at Hilo	—	209,189	—	209,189	—	—	—	—
University of Hawaii at Manoa	5	1,925,768	3	1,747,366	1	48,796	1	129,606
Total Hawaii	**7**	**3,220,774**	**5**	**3,042,372**	**1**	**48,796**	**1**	**129,606**
Illinois								
Children's Memorial Hospital, Chicago	3	899,910	2	867,434	1	32,476	—	—
Evanston Northwestern Healthcare	4	1,390,957	3	1,342,161	1	48,796	—	—
Howard Brown Health Center	—	162,000	—	162,000	—	—	—	—
Illinois Institute of Technology	1	306,230	1	306,230	—	—	—	—
Loyola University, Chicago	11	5,752,142	10	5,705,316	1	46,826	—	—
Northwestern University	70	36,682,242	63	29,551,795	4	856,050	3	6,274,397
Rush University Medical Center	8	2,698,231	7	2,531,515	—	—	1	166,716
University of Chicago	51	18,782,740	45	17,086,765	6	1,695,975	—	—
University of Illinois at Chicago	53	23,458,465	46	21,489,093	6	1,676,640	1	292,732
University of Illinois Urbana-Champaign	5	1,714,680	5	1,714,680	—	—	—	—
Total Illinois	**206**	**91,847,597**	**182**	**80,756,989**	**19**	**4,356,763**	**5**	**6,733,845**
Indiana								
General Biotechnology, LLC	1	518,616	1	518,616	—	—	—	—
Indiana University-Purdue University at Indianapolis	52	19,126,032	46	17,575,268	5	898,351	1	652,413
Indiana University Bloomington	1	359,123	1	359,123	—	—	—	—
Molecular Kinetics, Inc.	1	100,000	1	100,000	—	—	—	—
Purdue University West Lafayette	6	1,313,511	5	1,266,685	1	46,826	—	—
SonarMed, Inc.	2	1,314,312	2	1,314,312	—	—	—	—
University of Notre Dame	5	3,120,548	5	3,120,548	—	—	—	—
Total Indiana	**68**	**25,852,142**	**61**	**24,254,552**	**6**	**945,177**	**1**	**652,413**

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Iowa								
DMAG	1	99,340	—	—	—	—	1	99,340
Maharishi University of Management Research Institute	1	654,851	1	654,851	—	—	—	—
University of Iowa	68	33,315,181	60	30,695,559	7	2,497,393	1	122,229
VIDA Diagnostics, Inc.	3	596,723	3	596,723	—	—	—	—
Total Iowa	**73**	**34,666,095**	**64**	**31,947,133**	**7**	**2,497,393**	**2**	**221,569**
Kansas								
University of Kansas Medical Center	7	2,650,319	7	2,650,319	—	—	—	—
Total Kansas	**7**	**2,650,319**	**7**	**2,650,319**	**—**	**—**	**—**	**—**
Kentucky								
Pharmacogenetics Diagnostic Laboratories	1	115,534	1	115,534	—	—	—	—
SCR, Inc.	1	268,790	1	268,790	—	—	—	—
University of Kentucky	25	10,366,307	24	10,240,305	1	126,002	—	—
University of Louisville	22	9,049,223	20	8,819,177	2	230,046	—	—
Western Kentucky University	1	204,750	1	204,750	—	—	—	—
Total Kentucky	**50**	**20,004,604**	**47**	**19,648,556**	**3**	**356,048**	**—**	**—**
Louisiana								
Louisiana State University Agricultural and Mechanical College, Baton Rouge	1	338,490	1	338,490	—	—	—	—
Louisiana State University Health Science Center New Orleans	5	3,854,714	4	3,598,786	—	—	1	255,928
Louisiana State University Health Science Center Shreveport	5	1,292,567	5	1,292,567	—	—	—	—
Louisiana State University Pennington Biomedical Research Center	5	1,812,765	5	1,812,765	—	—	—	—
Ochsner Clinic Foundation	1	270,231	1	270,231	—	—	—	—
Tulane University of Louisiana	16	6,888,113	15	6,850,569	1	37,544	—	—
Total Louisiana	**33**	**14,456,880**	**31**	**14,163,408**	**1**	**37,544**	**1**	**255,928**
Maine								
Jackson Laboratory	9	5,595,953	8	5,445,843	1	150,110	—	—
Maine Medical Center	3	966,019	3	966,019	—	—	—	—
Total Maine	**12**	**6,561,972**	**11**	**6,411,862**	**1**	**150,110**	**—**	**—**
Maryland								
Agency for Health Care Administration	1	50,000	—	—	—	—	1	50,000
American Physiological Society	1	10,000	1	10,000	—	—	—	—
American Society for Investigative Pathology	1	10,000	1	10,000	—	—	—	—
BioAssessments, LLC	1	149,799	1	149,799	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Bon Secours Hospital, Baltimore	1	563,522	1	563,522	—	—	—	—
Clinical Trials and Surveys Corporation	1	754,096	1	754,096	—	—	—	—
EMMES Corporation	2	728,427	1	711,121	—	—	—	17,306
Engineering and Scientific Research Associates	1	474,124	1	474,124	—	—	—	—
Fast Imaging Company, LLC	1	362,070	1	362,070	—	—	—	—
Federation of American Societies for Experimental Biology	2	15,000	2	15,000	—	—	—	—
Foresight Science and Technology, Inc.	1	34,000	—	—	—	—	1	34,000
Henry M. Jackson Foundation for the Advancement of Military Medicine	4	1,782,916	2	845,246	1	175,893	1	761,777
IM Systems	1	607,079	1	607,079	—	—	—	—
Infinite Biomedical Technologies, LLC	1	1,002,889	1	1,002,889	—	—	—	—
J. Craig Venter Institute, Inc.	1	1,548,290	—	—	—	—	1	1,548,290
Johns Hopkins University	165	88,807,988	136	75,846,092	20	4,262,411	9	8,699,485
Larta Institute	1	102,000	—	—	—	—	1	102,000
Maryland Medical Research Institute, Inc.	1	610,147	1	610,147	—	—	—	—
Medstar Research Institute	3	3,084,022	3	3,084,022	—	—	—	—
National Cancer Institute	1	110,000	—	—	—	—	1	110,000
National Center for Health Statistics	1	200,000	—	—	—	—	1	200,000
National Eye Institute	1	198,000	—	—	—	—	1	198,000
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	1	976,500	—	—	—	—	1	976,500
National Library of Medicine	1	200,000	—	—	—	—	1	200,000
National Science Foundation	2	350,000	—	—	—	—	2	350,000
New Health Sciences, Inc.	1	133,290	1	133,290	—	—	—	—
NIH Office of Loan Repayment	1	9,681,257	—	—	—	—	1	9,681,257
Panacea Pharmaceuticals, Inc.	1	262,622	1	262,622	—	—	—	—
Peace Technology, Inc.	1	2,728,134	—	—	—	—	1	2,728,134
Perinatronics Medical Systems, Inc.	1	836,174	1	836,174	—	—	—	—
Primary Care Coalition of Montgomery County	1	173,324	1	173,324	—	—	—	—
Prolias, LLC	1	100,539	1	100,539	—	—	—	—
Quality Biological, Inc.	1	107,143	1	107,143	—	—	—	—
Seracare Bioservices	1	2,181,239	—	—	—	—	1	2,181,239
Sickle Cell Disease Association of America	1	10,000	1	10,000	—	—	—	—
Social and Scientific Systems, Inc.	1	1,704,813	—	—	—	—	1	1,704,813
Suburban Hospital	1	4,675,515	—	—	—	—	1	4,675,515
U.S. Department of Health and Human Services	5	873,803	—	—	—	—	5	873,803
U.S. Food and Drug Administration	2	165,000	—	—	—	—	2	165,000
U.S. Gallup Indian Medical Center	1	20,000	—	—	—	—	1	20,000
U.S. Health Resources and Services Administration	3	210,000	—	—	—	—	3	210,000

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
U.S. PHS Indian Health Service	2	232,581	—	—	—	—	2	232,581
University of Maryland, Baltimore	41	20,058,438	38	19,452,660	3	605,778	—	—
University of Maryland, College Park	1	109,846	1	109,846	—	—	—	—
University of Maryland Biotechnology Institute	1	352,012	1	352,012	—	—	—	—
Westat, Inc.	1	3,999,359	—	—	—	—	1	3,999,359
Total Maryland	**267**	**153,745,958**	**201**	**106,582,817**	**24**	**5,044,082**	**42**	**42,119,059**
Massachusetts								
ABIOMED, Inc.	3	962,084	2	862,772	—	—	1	99,312
Aeris Therapeutics, Inc.	1	391,775	1	391,775	—	—	—	—
Aerodyne Research, Inc.	1	362,181	1	362,181	—	—	—	—
American National Red Cross Blood Service, New England	1	520,419	—	—	—	—	1	520,419
Baystate Medical Center	1	327,672	—	—	—	—	1	327,672
Beth Israel Deaconess Medical Center	52	23,118,831	46	22,067,573	6	1,051,258	—	—
BioPhysics Assay Laboratory, Inc.	1	309,578	1	309,578	—	—	—	—
BioSense Technologies, Inc.	1	365,793	1	365,793	—	—	—	—
BioSurfaces	2	469,619	1	369,619	—	—	1	100,000
Boston Biomedical Research Institute	2	959,404	2	959,404	—	—	—	—
Boston Medical Center	16	9,413,972	16	9,413,972	—	—	—	—
Boston University	11	6,751,480	10	5,552,581	—	—	1	1,198,899
Boston University Medical Campus	44	27,395,775	39	24,939,255	5	2,456,520	—	—
Brandeis University	2	446,352	2	446,352	—	—	—	—
Brigham and Women's Hospital	117	60,321,277	104	54,299,586	11	4,044,098	2	1,977,593
Caritas St. Elizabeth's Medical Center	2	803,799	2	803,799	—	—	—	—
Cell Imaging Systems, LLC.	1	492,360	1	492,360	—	—	—	—
Children's Hospital Boston	49	20,297,523	42	18,339,478	7	1,958,045	—	—
Corum Medical	1	127,648	1	127,648	—	—	—	—
Dana-Farber Cancer Institute	16	6,101,155	16	6,101,155	—	—	—	—
Education Development Center, Inc.	1	617,712	1	617,712	—	—	—	—
GLSynthesis, Inc.	2	632,836	2	632,836	—	—	—	—
Grady Research, Inc.	1	668,250	1	668,250	—	—	—	—
Gwathmey, Inc.	1	1,457,861	1	1,457,861	—	—	—	—
Harvard Pilgrim Health Care, Inc.	3	1,568,619	3	1,568,619	—	—	—	—
Harvard University	1	360,000	1	360,000	—	—	—	—
Harvard University Medical School	13	4,501,857	10	3,485,068	3	1,016,789	—	—
Harvard University School of Public Health	21	7,935,211	16	7,087,472	5	847,739	—	—
Immune Disease Institute, Inc.	6	9,696,414	6	9,696,414	—	—	—	—
Immunetics, Inc.	1	784,267	1	784,267	—	—	—	—
InfoSciencetex Corporation	1	570,495	1	570,495	—	—	—	—
IQuum, Inc.	1	996,837	1	996,837	—	—	—	—
Joslin Diabetes Center	2	990,005	2	990,005	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Levitronix, LLC	2	1,429,919	2	1,429,919	—	—	—	—
Massachusetts Eye and Ear Infirmary	1	125,982	1	125,982	—	—	—	—
Massachusetts General Hospital	61	33,943,144	56	31,043,991	4	1,438,513	1	1,460,640
Massachusetts Institute of Technology	11	21,669,211	8	8,110,263	2	86,948	1	13,472,000
MatTek Corporation	1	215,533	1	215,533	—	—	—	—
Neuroprotection	1	178,288	1	178,288	—	—	—	—
New England Medical Center Hospitals	25	9,424,591	22	8,843,292	1	439,360	2	141,939
New England Research Institutes, Inc.	6	19,305,323	5	17,087,599	—	—	1	2,217,724
Newton Laboratories	1	395,798	1	395,798	—	—	—	—
Northeastern University	1	260,510	1	260,510	—	—	—	—
Physical Sciences, Inc.	1	89,059	1	89,059	—	—	—	—
Progeria Research Foundation, Inc.	1	15,000	1	15,000	—	—	—	—
Radiation Monitoring Devices, Inc.	1	426,714	1	426,714	—	—	—	—
Trustees of Boston University	1	2,926,136	—	—	—	—	1	2,926,136
Tufts University Boston	10	3,094,994	7	2,427,778	2	215,049	1	452,167
University of Massachusetts, Amherst	2	490,680	2	490,680	—	—	—	—
University of Massachusetts Medical School, Worcester	22	8,461,496	20	8,358,765	2	102,731	—	—
University of Massachusetts Lowell	1	231,000	1	231,000	—	—	—	—
Verax Biomedical, Inc.	1	713,042	1	713,042	—	—	—	—
Whitehead Institute for Biomedical Res	1	50,428	—	—	1	50,428	—	—
ZymeQuest, Inc.	1	171,033	1	171,033	—	—	—	—
Total Massachusetts	**530**	**294,336,942**	**467**	**255,734,963**	**49**	**13,707,478**	**14**	**24,894,501**
Michigan								
Central Michigan University	1	191,414	1	191,414	—	—	—	—
Henry Ford Health System	12	6,089,492	12	6,089,492	—	—	—	—
MC3, Inc.	4	1,346,492	4	1,346,492	—	—	—	—
MedArray, Inc.	1	617,994	1	617,994	—	—	—	—
Michigan State University	10	3,469,572	10	3,469,572	—	—	—	—
Phrixus Pharmaceuticals, Inc.	1	215,084	1	215,084	—	—	—	—
St. Joseph Mercy Oakland	2	337,117	2	337,117	—	—	—	—
University of Michigan at Ann Arbor	97	40,348,203	91	38,404,060	5	1,671,183	1	272,960
Van Andel Research Institute	1	455,000	1	455,000	—	—	—	—
Wayne State University	17	5,113,439	16	4,983,767	—	—	1	129,672
Total Michigan	**146**	**58,183,807**	**139**	**56,109,992**	**5**	**1,671,183**	**2**	**402,632**
Minnesota								
Advanced Circulatory Systems, Inc.	3	1,664,182	3	1,664,182	—	—	—	—
Discovery Genomics, Inc.	1	837,417	1	837,417	—	—	—	—
Gel-Del Technologies, Inc.	1	1,025,888	1	1,025,888	—	—	—	—
HealthPartners Research Foundation	1	104,536	1	104,536	—	—	—	—
Mayo Clinic College of Medicine, Rochester	55	24,275,971	52	23,611,078	2	366,597	1	298,296

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Minneapolis Medical Research Foundation, Inc.	2	547,679	1	304,616	—	—	1	243,063
Minnesota Veterans Research Institute	1	749,132	1	749,132	—	—	—	—
Phygen, Inc.	1	787,734	1	787,734	—	—	—	—
Powerscope, Inc.	1	397,223	1	397,223	—	—	—	—
University of Minnesota Twin Cities	71	32,989,803	62	28,996,003	6	1,649,133	3	2,344,667
Total Minnesota	**137**	**63,379,565**	**124**	**58,477,809**	**8**	**2,015,730**	**5**	**2,886,026**
Mississippi								
Jackson Hinds Comprehensive Health Center	1	587,988	1	587,988	—	—	—	—
Jackson State University	1	489,935	—	—	—	—	1	489,935
Tougaloo College	1	997,467	—	—	—	—	1	997,467
University of Mississippi Medical Center	17	10,207,727	12	5,832,896	2	100,914	3	4,273,917
University of Southern Mississippi	1	212,649	1	212,649	—	—	—	—
Total Mississippi	**21**	**12,495,766**	**14**	**6,633,533**	**2**	**100,914**	**5**	**5,761,319**
Missouri								
APT Therapeutics, Inc.	2	643,262	2	643,262	—	—	—	—
Auxagen, Inc.	1	199,467	1	199,467	—	—	—	—
Children's Mercy Hospital, Kansas City	3	528,456	3	528,456	—	—	—	—
Mid America Heart Institute of St. Luke's Hospital	1	324,088	1	324,088	—	—	—	—
Saint Louis University	7	2,467,691	7	2,467,691	—	—	—	—
University of Missouri, Columbia	24	8,417,913	22	8,373,975	2	43,938	—	—
Washington University	104	55,200,642	96	52,026,937	7	2,895,367	1	278,338
Total Missouri	**142**	**67,781,519**	**132**	**64,563,876**	**9**	**2,939,305**	**1**	**278,338**
Montana								
Montana State University, Bozeman	1	396,016	1	396,016	—	—	—	—
University of Montana	2	355,812	1	297,776	1	58,036	—	—
Total Montana	**3**	**751,828**	**2**	**693,792**	**1**	**58,036**	**—**	**—**
Nebraska								
Creighton University	3	661,856	3	661,856	—	—	—	—
University of Nebraska Lincoln	1	1,868,780	1	1,868,780	—	—	—	—
University of Nebraska Medical Center	7	3,255,575	7	3,255,575	—	—	—	—
Total Nebraska	**11**	**5,786,211**	**11**	**5,786,211**	**—**	**—**	**—**	**—**
Nevada								
Nevada Cancer Institute	1	320,985	1	320,985	—	—	—	—
University of Nevada Reno	8	2,008,013	7	1,980,787	1	27,226	—	—
Total Nevada	**9**	**2,328,998**	**8**	**2,301,772**	**1**	**27,226**	**—**	**—**

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
New Hampshire								
Creare, Inc.	1	508,233	1	508,233	—	—	—	—
Dartmouth College	14	5,087,300	14	5,087,300	—	—	—	—
Xemed, LLC	1	104,747	1	104,747	—	—	—	—
Total New Hampshire	**16**	**5,700,280**	**16**	**5,700,280**	**—**	**—**	**—**	**—**
New Jersey								
Allied Innovative Systems, LLC	1	375,169	1	375,169	—	—	—	—
DVX, LLC	1	561,333	1	561,333	—	—	—	—
Hackensack University Medical Center	1	444,920	1	444,920	—	—	—	—
Menssana Research, Inc.	1	1,000,000	1	1,000,000	—	—	—	—
Princeton Multimedia Technologies Corporation	2	1,277,897	2	1,277,897	—	—	—	—
Rutgers, The State University of New Jersey, New Brunswick	1	234,546	1	234,546	—	—	—	—
University of Medicine and Dentistry of New Jersey-New Jersey Medical School	20	9,300,488	16	8,405,073	3	693,436	1	201,979
University of Medicine and Dentistry of New Jersey-Robert Wood Johnson Medical School	5	3,308,365	5	3,308,365	—	—	—	—
Vasade BioSciences, Inc.	1	393,566	1	393,566	—	—	—	—
Total New Jersey	**33**	**16,896,284**	**29**	**16,000,869**	**3**	**693,436**	**1**	**201,979**
New Mexico								
ABQMR, Inc.	1	167,183	1	167,183	—	—	—	—
Diné College	1	371,032	1	371,032	—	—	—	—
Lovelace Biomedical and Environmental Research	6	3,598,560	4	1,766,569	1	3,106	1	1,828,885
Sandia National Laboratories	1	149,127	1	149,127	—	—	—	—
Southwest Sciences, Inc.	2	483,684	2	483,684	—	—	—	—
University of New Mexico	13	3,796,851	10	3,388,863	3	407,988	—	—
Veterans Administration Center	1	4,977,622	—	—	—	—	1	4,977,622
Total New Mexico	**25**	**13,544,059**	**19**	**6,326,458**	**4**	**411,094**	**2**	**6,806,507**
New York								
Aaron Diamond AIDS Research Center	1	627,463	1	627,463	—	—	—	—
Albany College of Pharmacy	—	120,615	—	120,615	—	—	—	—
Albany Medical College	6	1,637,978	5	1,588,358	1	49,620	—	—
Albany Research Institute, Inc.	1	116,430	1	116,430	—	—	—	—
American Thoracic Society	1	32,750	1	32,750	—	—	—	—
Angion Biomedica Corporation	3	1,873,956	3	1,873,956	—	—	—	—
Biomedica Management Corporation	1	103,148	1	103,148	—	—	—	—
Cell Preservation Services, Inc.	1	206,375	1	206,375	—	—	—	—
City College of New York	2	902,301	2	902,301	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Cold Spring Harbor Laboratory	1	15,000	1	15,000	—	—	—	—
Columbia University	7	2,506,512	7	2,506,512	—	—	—	—
Columbia University Health Sciences	84	48,414,540	74	45,049,844	8	1,347,386	2	2,017,310
Cornell University	9	4,099,219	8	4,047,171	1	52,048	—	—
CUNY Graduate School and University Center	1	328,970	1	328,970	—	—	—	—
Dawkins Productions, Inc.	1	163,436	1	163,436	—	—	—	—
EndoMedix, Inc.	1	178,288	1	178,288	—	—	—	—
Feinstein Institute for Medical Research	3	1,095,818	3	1,095,818	—	—	—	—
Gene Network Sciences, Inc.	1	555,728	1	555,728	—	—	—	—
Heart Valve Society of America	1	10,000	1	10,000	—	—	—	—
Hospital for Special Surgery	1	418,746	1	418,746	—	—	—	—
Jarvik Heart, Inc.	1	859,238	—	—	—	—	1	859,238
Masonic Medical Research Laboratory, Inc.	2	552,938	2	552,938	—	—	—	—
Mohawk Innovative Technology, Inc.	2	1,060,923	2	1,060,923	—	—	—	—
Montefiore Medical Center, Bronx	2	649,883	2	649,883	—	—	—	—
Mount Sinai School of Medicine of New York University	22	16,756,929	21	13,761,990	—	—	1	2,994,939
Narrows Institute for Biomedical Research Inc.	1	285,165	1	285,165	—	—	—	—
National Hemophilia Foundation	1	2,500	1	2,500	—	—	—	—
New York Academy of Medicine	1	523,483	1	523,483	—	—	—	—
New York Blood Center	4	1,307,102	4	1,307,102	—	—	—	—
New York Medical College	15	9,110,096	15	9,110,096	—	—	—	—
New York University School of Medicine	27	11,232,092	24	10,816,255	3	415,837	—	—
Ogilvy Public Relations Worldwide	3	1,424,977	—	—	—	—	3	1,424,977
Queens College	1	373,835	1	373,835	—	—	—	—
Regeneron Pharmaceuticals, Inc.	—	1,000,000	—	1,000,000	—	—	—	—
Rensselaer Polytechnic Institute	1	357,064	1	357,064	—	—	—	—
Rochester Institute of Technology	1	203,790	1	203,790	—	—	—	—
Rockefeller University	6	1,814,784	4	1,715,910	2	98,874	—	—
Roswell Park Cancer Institute Corporation	1	432,964	1	432,964	—	—	—	—
Sloan-Kettering Institute for Cancer Research	5	1,018,402	5	1,018,402	—	—	—	—
St. John's University	—	23,916	—	23,916	—	—	—	—
St. Luke's-Roosevelt Institute for Health Sciences	6	1,917,219	5	1,866,791	1	50,428	—	—
State University New York at Binghamton	1	215,297	1	215,297	—	—	—	—
State University New York at Stony Brook	9	2,936,188	9	2,936,188	—	—	—	—
State University of New York at Buffalo	16	6,106,633	16	6,106,633	—	—	—	—
Suny Downstate Medical Center	4	1,029,806	3	887,080	—	—	1	142,726
Syracuse University	2	933,405	2	933,405	—	—	—	—
Therasource, LLC	1	499,641	1	499,641	—	—	—	—
Trudeau Institute, Inc.	1	424,813	1	424,813	—	—	—	—
Union Graduate College	—	80,000	—	80,000	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
University of Rochester	49	20,175,205	44	18,865,337	5	1,309,868	—	—
Upstate Medical University	8	6,382,063	8	6,382,063	—	—	—	—
Visiting Nurse Service of New York	1	709,717	1	709,717	—	—	—	—
Weill Medical College of Cornell University	40	23,496,620	35	21,551,199	4	421,979	1	1,523,442
Winifred Masterson Burke Medical Research Institute	1	450,844	1	450,844	—	—	—	—
Yeshiva University	32	16,348,531	25	12,101,206	4	336,658	3	3,910,667
Total New York	**393**	**194,103,336**	**352**	**177,147,339**	**29**	**4,082,698**	**12**	**12,873,299**
North Carolina								
Affinergy, Inc.	1	249,920	1	249,920	—	—	—	—
Appalachian State University	1	175,792	1	175,792	—	—	—	—
BreathQuant Medical Systems, Inc.	1	397,224	1	397,224	—	—	—	—
Constella Group, LLC	1	709,932	—	—	—	—	1	709,932
Duke University	112	62,976,321	98	60,265,508	11	1,909,104	3	801,709
East Carolina University	1	54,308	—	—	1	54,308	—	—
Ercole Biotech, Inc.	1	565,003	1	565,003	—	—	—	—
Heart Imaging Technologies, LLC	1	561,478	1	561,478	—	—	—	—
North Carolina Agriculture and Technical State University	1	210,000	1	210,000	—	—	—	—
North Carolina Central University	4	1,101,993	4	1,101,993	—	—	—	—
North Carolina State University	4	1,046,424	2	702,139	2	344,285	—	—
Research Triangle Institute	—	92,000	—	92,000	—	—	—	—
Rho Federal Systems Division, Inc.	2	4,003,617	2	4,003,617	—	—	—	—
RTI International	1	1,559,965	—	—	—	—	1	1,559,965
University of North Carolina at Pembroke	—	253,077	—	253,077	—	—	—	—
University of North Carolina at Chapel Hill	81	42,408,152	68	34,262,012	10	2,002,462	3	6,143,678
Wake Forest University	7	5,222,451	4	1,328,339	—	—	3	3,894,112
Wake Forest University Health Sciences	45	26,447,113	39	24,296,982	3	343,753	3	1,806,378
Williams LifeSkills, Inc.	2	647,864	2	647,864	—	—	—	—
Total North Carolina	**266**	**148,682,634**	**225**	**129,112,948**	**27**	**4,653,912**	**14**	**14,915,774**
Ohio								
Arteriocyte, Inc.	—	37,502	—	37,502	—	—	—	—
BIOMEC, Inc.	2	2,011,917	2	2,011,917	—	—	—	—
Case Western Reserve University	67	23,672,485	54	18,864,909	12	3,098,633	1	1,708,943
Children's Hospital Medical Center, Cincinnati	49	24,255,356	47	23,956,864	2	298,492	—	—
Children's Research Institute	4	802,772	4	802,772	—	—	—	—
Cleveland Clinic Foundation	1	325,212	—	—	—	—	1	325,212
Cleveland Clinic Lerner College of Medicine of Case Western Reserve University	46	28,804,567	42	28,049,021	3	388,109	1	367,437
Cleveland Medical Devices, Inc.	1	591,065	1	591,065	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Cleveland State University	2	516,358	2	516,358	—	—	—	—
Kent State University at Kent	1	320,879	1	320,879	—	—	—	—
MetroHealth Medical Center	2	371,290	1	320,012	1	51,278	—	—
Northeastern Ohio Universities College of Medicine	—	71,000	—	71,000	—	—	—	—
Nova-Ther Technologies	1	185,206	1	185,206	—	—	—	—
Ohio State University	40	14,286,893	37	11,546,711	1	239,881	2	2,500,301
Ohio University Athens	1	360,688	1	360,688	—	—	—	—
University of Akron	1	348,456	1	348,456	—	—	—	—
University of Cincinnati	43	18,200,924	40	17,304,103	2	451,823	1	444,998
University of Toledo	2	265,471	1	219,058	1	46,413	—	—
University of Toledo Health Science Campus	4	4,278,046	4	4,278,046	—	—	—	—
Wright State University	4	1,275,124	3	1,162,586	1	112,538	—	—
Total Ohio	**271**	**120,981,211**	**242**	**110,947,153**	**23**	**4,687,167**	**6**	**5,346,891**
Oklahoma								
Oklahoma Medical Research Foundation	2	2,086,633	2	2,086,633	—	—	—	—
Oklahoma State University Stillwater	2	643,253	2	643,253	—	—	—	—
University of Oklahoma Health Sciences Center	14	5,887,880	13	5,826,244	1	61,636	—	—
Total Oklahoma	**18**	**8,617,766**	**17**	**8,556,130**	**1**	**61,636**	**—**	**—**
Oregon								
Oregon Center for Applied Science, Inc.	1	238,964	1	238,964	—	—	—	—
Oregon Health and Science University	33	11,525,032	30	11,085,045	3	439,987	—	—
Oregon Research Institute	3	1,631,840	3	1,631,840	—	—	—	—
Oregon State University	2	582,866	2	582,866	—	—	—	—
Portland State University	1	362,500	1	362,500	—	—	—	—
S P Tech	1	190,100	1	190,100	—	—	—	—
Total Oregon	**41**	**14,531,302**	**38**	**14,091,315**	**3**	**439,987**	**—**	**—**
Pennsylvania								
Allegheny-Singer Research Institute	1	278,268	1	278,268	—	—	—	—
Carnegie-Mellon University	3	913,840	2	869,195	1	44,645	—	—
Children's Hospital Pittsburgh/UPMC Health System	10	4,690,221	9	4,453,577	—	—	1	236,644
Children's Hospital of Philadelphia	41	25,578,352	38	23,637,904	2	709,931	1	1,230,517
Drexel University	7	1,270,122	6	1,270,121	1	1	—	—
Ension, Inc.	3	937,978	1	456,367	—	—	2	481,611
Fox Chase Cancer Center	4	1,494,371	4	1,494,371	—	—	—	—
Industrial Science and Technology Network	1	715,015	1	715,015	—	—	—	—
InfraScan, Inc.	1	150,000	1	150,000	—	—	—	—
Institute for Cancer Research	1	384,750	1	384,750	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Institute for Transfusion Medicine	1	71,730	—	—	—	—	1	71,730
Lankenau Institute for Medical Research	1	379,272	1	379,272	—	—	—	—
Lehigh University	1	233,285	1	233,285	—	—	—	—
Magee-Women's Health Corporation	1	150,000	—	—	1	150,000	—	—
Molecular Targeting Technology, Inc.	1	752,344	1	752,344	—	—	—	—
NanoDynamics Life Sciences, Inc.	1	99,616	—	—	—	—	1	99,616
National Disease Research Interchange	—	135,495	—	135,495	—	—	—	—
Octagen Corporation	1	975,103	1	975,103	—	—	—	—
Pennsylvania College of Optometry	1	338,976	1	338,976	—	—	—	—
Pennsylvania State University, Milton S. Hershey Medical Center	17	10,546,956	16	10,383,198	—	—	1	163,758
Pennsylvania State University-University Park	6	1,548,162	6	1,548,162	—	—	—	—
PhenoTech, Inc.	1	509,519	1	509,519	—	—	—	—
PinMed, Inc.	1	326,474	1	326,474	—	—	—	—
PolyMedix, Inc.	1	100,000	1	100,000	—	—	—	—
Progenra, Inc.	1	269,268	1	269,268	—	—	—	—
RNARx	1	97,396	1	97,396	—	—	—	—
Separation Design Group, LLC	1	418,244	1	418,244	—	—	—	—
SpeCenterasonics, Inc.	1	100,000	1	100,000	—	—	—	—
Temple University	28	9,963,651	24	9,047,726	3	552,984	1	362,941
Thomas Jefferson University	23	9,537,682	22	9,512,906	1	24,776	—	—
Trustees University of Pennsylvania	1	483,373	—	—	—	—	1	483,373
University of Pennsylvania	136	68,742,782	120	64,416,709	16	4,326,073	—	—
University of Pittsburgh at Pittsburgh	114	52,268,421	100	47,795,981	10	1,740,102	4	2,732,338
Weis Center for Research-Geisinger Clinic	1	359,270	1	359,270	—	—	—	—
Wistar Institute	1	1,598,718	1	1,598,718	—	—	—	—
Total Pennsylvania	**414**	**196,418,654**	**366**	**183,007,614**	**35**	**7,548,512**	**13**	**5,862,528**
Rhode Island								
Brown University	6	2,864,378	6	2,864,378	—	—	—	—
Butler Hospital	1	498,917	1	498,917	—	—	—	—
EpiVax, Inc.	1	263,867	1	263,867	—	—	—	—
Gordon Research Conferences	8	93,000	8	93,000	—	—	—	—
Memorial Hospital of Rhode Island	1	188,814	1	188,814	—	—	—	—
Miriam Hospital	7	3,172,557	6	2,841,124	1	331,433	—	—
Pro-Change Behavior Systems, Inc.	1	144,116	1	144,116	—	—	—	—
QualityMetric, Inc.	1	778,999	1	778,999	—	—	—	—
Rhode Island Hospital	6	3,435,007	6	3,435,007	—	—	—	—
Roger Williams Hospital	1	121,284	1	121,284	—	—	—	—
Women and Infants Hospital of Rhode Island	—	20,000	—	20,000	—	—	—	—
Total Rhode Island	**33**	**11,580,939**	**32**	**11,249,506**	**1**	**331,433**	**—**	**—**

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
South Carolina								
Clemson University	5	973,332	5	973,332	—	—	—	—
Medical University of South Carolina	29	12,858,559	23	9,138,927	4	861,071	2	2,858,561
University of South Carolina at Columbia	10	3,391,534	10	3,391,534	—	—	—	—
Total South Carolina	**44**	**17,223,425**	**38**	**13,503,793**	**4**	**861,071**	**2**	**2,858,561**
South Dakota								
Black Hills Center/American Indian Health	1	447,354	1	447,354	—	—	—	—
Missouri Breaks Research, Inc.	2	1,170,869	2	1,170,869	—	—	—	—
Sanford Research/University of South Dakota	1	262,338	1	262,338	—	—	—	—
University of South Dakota	2	690,862	2	690,862	—	—	—	—
Total South Dakota	**6**	**2,571,423**	**6**	**2,571,423**	**—**	**—**	**—**	**—**
Tennessee								
East Tennessee State University	3	775,316	3	775,316	—	—	—	—
Meharry Medical College	5	841,702	2	327,109	3	514,593	—	—
St. Jude Children's Research Hospital	9	8,782,698	7	8,286,691	—	—	2	496,007
University of Memphis	3	1,371,370	3	1,371,370	—	—	—	—
University of Tennessee Health Science Center	25	9,199,498	24	8,991,930	1	207,568	—	—
University of Tennessee Knoxville	1	240,270	1	240,270	—	—	—	—
Vanderbilt University	88	37,879,034	76	35,544,008	11	2,068,595	1	266,431
Veterans Administration Center	1	2,729,635	—	—	—	—	1	2,729,635
Total Tennessee	**135**	**61,819,523**	**116**	**55,536,694**	**15**	**2,790,756**	**4**	**3,492,073**
Texas								
Baylor College of Medicine	71	26,188,102	61	23,645,528	8	1,623,399	2	919,175
Baylor Research Institute	—	236,605	—	236,605	—	—	—	—
CorInnova, Inc.	1	362,360	1	362,360	—	—	—	—
Kardia Therapeutics, Inc.	1	734,567	1	734,567	—	—	—	—
Lynntech, Inc.	3	964,615	3	964,615	—	—	—	—
Methodist Hospital Research Institute	3	884,117	3	884,117	—	—	—	—
Millar Instruments, Inc.	1	372,515	1	372,515	—	—	—	—
Organizational Wellness and Learning System	1	370,553	1	370,553	—	—	—	—
Rice University	4	1,043,931	4	1,043,931	—	—	—	—
Scott and White Memorial Hospital	1	136,080	1	136,080	—	—	—	—
Southwest Foundation for Biomedical Research	6	6,069,584	5	5,603,467	—	—	1	466,117
Texas A&M University Health Science Center	9	4,488,606	9	4,488,606	—	—	—	—
Texas A&M University System	2	409,520	2	409,520	—	—	—	—
Texas Agricultural Experiment Station	3	1,044,516	3	1,044,516	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Texas Engineering Experiment Station	2	296,825	2	296,825	—	—	—	—
Texas Heart Institute	1	400,607	1	400,607	—	—	—	—
Texas Southern University	1	417,142	1	417,142	—	—	—	—
Texas Tech University Health Sciences Center	2	462,485	2	462,485	—	—	—	—
University of Houston	1	634,836	1	634,836	—	—	—	—
University of North Texas	1	342,530	1	342,530	—	—	—	—
University of North Texas Health Science Center	4	1,090,879	3	974,980	1	115,899	—	—
University of Texas at Austin	1	225,000	1	225,000	—	—	—	—
University of Texas at Dallas	1	270,000	1	270,000	—	—	—	—
University of Texas Health Center at Tyler	8	3,289,238	8	3,289,238	—	—	—	—
University of Texas Health Science Center at Houston	23	15,595,994	23	15,595,994	—	—	—	—
University of Texas Health Science Center at San Antonio	18	6,900,112	15	6,452,185	3	447,927	—	—
University of Texas M. D. Anderson Cancer Center	7	2,029,146	7	2,029,146	—	—	—	—
University of Texas Medical Branch at Galveston	10	4,239,632	8	2,801,426	1	85,633	1	1,352,573
University of Texas at San Antonio	2	253,222	1	212,250	1	40,972	—	—
University of Texas Southwestern Medical Center	52	26,423,237	47	22,748,584	3	1,061,423	2	2,613,230
Total Texas	**240**	**106,176,556**	**217**	**97,450,208**	**17**	**3,375,253**	**6**	**5,351,095**
Utah								
Applied Medical Visualizations, LLC	1	358,124	1	358,124	—	—	—	—
Frontier Scientific, Inc.	1	435,229	1	435,229	—	—	—	—
IHC Health Services, Inc.	1	568,246	1	568,246	—	—	—	—
LDS Hospital	1	316,196	—	—	—	—	1	316,196
Medical Physics, Inc.	1	105,732	1	105,732	—	—	—	—
Thrombodyne, Inc.	1	891,227	1	891,227	—	—	—	—
University of Utah	46	15,152,913	40	14,119,854	5	736,406	1	296,653
Utah Artificial Heart Institute	1	1,144,139	1	1,144,139	—	—	—	—
Total Utah	**53**	**18,971,806**	**46**	**17,622,551**	**5**	**736,406**	**2**	**612,849**
Vermont								
Haematologic Technologies, Inc.	1	351,562	1	351,562	—	—	—	—
Psychological Applications, LLC	1	444,199	1	444,199	—	—	—	—
University of Vermont and State Agricultural College	38	15,404,483	32	13,756,622	5	1,393,898	1	253,963
Total Vermont	**40**	**16,200,244**	**34**	**14,552,383**	**5**	**1,393,898**	**1**	**253,963**
Virginia								
American Psychosomatic Society	1	10,000	1	10,000	—	—	—	—
College of William and Mary	1	216,000	1	216,000	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
CW Optics, Inc.	3	1,786,560	3	1,786,560	—	—	—	—
Eastern Virginia Medical School	1	311,885	1	311,885	—	—	—	—
Empirical Technologies Corporation	2	464,342	2	464,342	—	—	—	—
Information Systems Associates, Inc.	1	100,023	1	100,023	—	—	—	—
Luna Innovations, Inc.	2	299,881	1	199,970	—	—	1	99,911
Mcguire Research Institute, Inc.	1	275,897	1	275,897	—	—	—	—
Talisman, Ltd.	1	948,035	1	948,035	—	—	—	—
The Lewin Group	1	649,376	—	—	—	—	1	649,376
University of Virginia, Charlottesville	48	23,674,896	42	21,953,851	6	1,721,045	—	—
Virginia Commonwealth University	15	4,391,889	14	4,175,044	1	216,845	—	—
Virginia Polytechnic Institute and State University	1	268,635	1	268,635	—	—	—	—
Total Virginia	**78**	**33,397,419**	**69**	**30,710,242**	**7**	**1,937,890**	**2**	**749,287**
Washington								
Asthma, Inc.	1	182,126	1	182,126	—	—	—	—
Axio Research, LLC	1	4,536,322	1	4,536,322	—	—	—	—
Battelle Centers for Public Health Research and Evaluation	1	191,840	1	191,840	—	—	—	—
Battelle Pacific Northwest Laboratories	1	1,876,275	1	1,876,275	—	—	—	—
Center for Health Studies	1	509,185	1	509,185	—	—	—	—
Children's Hospital and Regional Medical Center	6	2,534,043	6	2,534,043	—	—	—	—
E.I. SpeCentera, LLC	1	351,076	1	351,076	—	—	—	—
Fred Hutchinson Cancer Research Center	23	18,413,401	19	13,372,118	—	—	4	5,041,283
Insilicos	1	200,000	1	200,000	—	—	—	—
Institute for Systems Biology	2	2,494,833	1	123,535	—	—	1	2,371,298
Puget Sound Blood Center	4	2,620,434	3	2,562,898	1	57,536	—	—
Syntrix Biosystems, Inc.	1	705,130	1	705,130	—	—	—	—
University of Washington	127	75,829,117	109	62,646,033	12	3,410,178	6	9,772,906
VA Puget Sound Health Care System	1	119,975	—	—	—	—	1	119,975
VPDiagnostics, Inc.	1	991,848	1	991,848	—	—	—	—
Washington State University	3	1,169,731	3	1,169,731	—	—	—	—
Total Washington	**175**	**112,725,336**	**150**	**91,952,160**	**13**	**3,467,714**	**12**	**17,305,462**
West Virginia								
Marshall University	1	331,863	1	331,863	—	—	—	—
West Virginia University	11	3,254,400	10	3,220,366	1	34,034	—	—
Total West Virginia	**12**	**3,586,263**	**11**	**3,552,229**	**1**	**34,034**	**—**	**—**
Wisconsin								
American Society of Gene Therapy	1	10,000	1	10,000	—	—	—	—
BellBrook Labs, LLC	1	301,884	1	301,884	—	—	—	—
BloodCenter of Wisconsin, Inc.	7	4,597,552	6	4,090,302	—	—	1	507,250
Cellular Dynamics International, Inc.	1	249,898	1	249,898	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Marquette University	2	461,925	2	461,925	—	—	—	—
Medical College of Wisconsin	63	36,020,929	59	34,043,910	3	587,037	1	1,389,982
Society of Behavioral Medicine	—	10,000	—	10,000	—	—	—	—
SysLogic, Inc.	1	100,000	1	100,000	—	—	—	—
University of Wisconsin-Madison	50	18,334,720	45	16,980,297	5	1,354,423	—	—
University of Wisconsin-Milwaukee	1	221,550	1	221,550	—	—	—	—
Total Wisconsin	**127**	**60,308,458**	**117**	**56,469,766**	**8**	**1,941,460**	**2**	**1,897,232**
Puerto Rico								
Universidad Central Del Caribe	1	102,720	1	102,720	—	—	—	—
University of Puerto Rico Mayaguez	—	172,445	—	172,445	—	—	—	—
University of Puerto Rico Medical Sciences Campus	—	415,264	—	415,264	—	—	—	—
Total Puerto Rico	**1**	**690,429**	**1**	**690,429**	**—**	**—**	**—**	**—**
Total U.S.	**5,301**	**$2,560,436,846**	**4,651**	**$2,252,341,018**	**444**	**$93,533,636**	**206**	**$214,562,192**
Australia								
Baker Heart Research Institute	1	259,840	1	259,840	—	—	—	—
James Cook University of North Queensland	1	256,009	1	256,009	—	—	—	—
St. Vincent's Hospital, Melbourne Ltd.	1	204,807	1	204,807	—	—	—	—
University of Melbourne	1	189,636	1	189,636	—	—	—	—
Walter and Elizabeth Hall Institute Medical Research	2	491,962	2	491,962	—	—	—	—
Total Australia	**6**	**1,402,254**	**6**	**1,402,254**	**—**	**—**	**—**	**—**
Canada								
Clinical Research Institute of Montreal	1	281,609	1	281,609	—	—	—	—
Hospital for Sick Children, Toronto	3	577,988	3	577,988	—	—	—	—
McGill University	1	139,761	1	139,761	—	—	—	—
McMaster University	1	7,358,368	—	—	—	—	1	7,358,368
Montreal Heart Institute	2	512,170	2	512,170	—	—	—	—
Ottawa Health Research Institute	1	172,495	1	172,495	—	—	—	—
St. Michael's Hospital	1	196,566	1	196,566	—	—	—	—
University Health Network	3	522,721	2	470,673	1	52,048	—	—
University of Alberta	3	196,133	3	196,133	—	—	—	—
University of British Columbia	1	256,009	1	256,009	—	—	—	—
University of Calgary	2	358,707	2	358,707	—	—	—	—
University of Montreal	2	439,144	2	439,144	—	—	—	—
University of Toronto	—	80,000	—	80,000	—	—	—	—
University of Western Ontario	1	201,669	1	201,669	—	—	—	—
Total Canada	**22**	**11,293,340**	**20**	**3,882,924**	**1**	**52,048**	**1**	**7,358,368**

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Hungary								
Eötvös Loránd University	—	37,927	—	37,927	—	—	—	—
Total Hungary	**—**	**37,927**	**—**	**37,927**	**—**	**—**	**—**	**—**
Iceland								
Decode Genetics, Inc.	1	539,544	1	539,544	—	—	—	—
Total Iceland	**1**	**539,544**	**1**	**539,544**	**—**	**—**	**—**	**—**
Israel								
Technion-Israel Institute of Technology	—	62,921	—	62,921	—	—	—	—
Total Israel	**—**	**62,921**	**—**	**62,921**	**—**	**—**	**—**	**—**
Netherlands								
Wageningen University	1	464,956	1	464,956	—	—	—	—
Total Netherlands	**1**	**464,956**	**1**	**464,956**	**—**	**—**	**—**	**—**
New Zealand								
Auckland UniServices Limited	2	208,351	2	208,351	—	—	—	—
Total New Zealand	**2**	**208,351**	**2**	**208,351**	**—**	**—**	**—**	**—**
Sweden								
Uppsala University	1	153,605	1	153,605	—	—	—	—
Total Sweden	**1**	**153,605**	**1**	**153,605**	**—**	**—**	**—**	**—**
United Kingdom								
Imperial College London	1	649,798	—	—	—	—	1	649,798
Royal Free and University College Medical School	1	203,670	1	203,670	—	—	—	—
St. Mary's Hospital Newport	1	446,667	1	446,667	—	—	—	—
University College London	1	177,885	1	177,885	—	—	—	—
University of Bristol	1	531,913	1	531,913	—	—	—	—
University of Cambridge	1	262,170	1	262,170	—	—	—	—
Total United Kingdom	**6**	**2,272,103**	**5**	**1,622,305**	**—**	**—**	**1**	**649,798**
Total, Other	**39**	**$ 16,435,001**	**36**	**$ 8,374,787**	**1**	**$ 52,048**	**2**	**$ 8,008,166**
Grand Total	**5,340**	**$2,576,871,847**	**4,687**	**$2,260,715,805**	**445**	**$93,585,684**	**208**	**$222,570,358**

Appendixes

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 (Cooperative Agreement) (U19): To support a research program of multiple projects, requiring a broadly-based, multidisciplinary and often long-term approach, directed toward a specific major objective, common theme, or program goal relevant to the Institute's mission. The award involves substantial programmatic involvement by NHLBI staff to assist investigators during performance of the research activities.

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.

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 Clinically Oriented Research (SCCOR) Grants (P50): To foster multidisciplinary research on clinically relevant questions enabling basic science findings to be applied more rapidly to clinical problems. Research focuses on clinical and basic scientific issues related to diseases and disorders that are relevant to the mission of the NHLBI. The SCCOR program places more emphasis on clinical research than the SCOR program and requires at least 50 percent of the funded projects to be clinical.

Specialized Centers of Research (SCOR) Grants (P50): To support both basic and clinical research related to an Institute-identified theme. Each SCOR program is developed to assure interactions between basic and clinical scientists that will enhance the transfer of fundamental research findings to a clinical setting.

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 included the Preventive Cardiology Academic Award, the Preventive Pulmonary Academic Award, the Transfusion Medicine Academic Award, the Systemic Pulmonary and Vascular Diseases Academic Awards, the Asthma Academic Award, the Tuberculosis Academic Award, the Sleep Academic Award, and the Nutrition 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.

Research Career Development Program in Vascular Medicine (K12): To promote comprehensive clinical research training for physicians 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 (K12): 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.

Research Career Development Program in the Genetics and Genomics of Lung Diseases (K12): To develop multidisciplinary career development programs in genetics and genomics of lung diseases that will equip new investigators with the knowledge and skills to elucidate the etiology and pathogenesis of such diseases.

Minority School Faculty Development Award (K14): To develop faculty investigators at minority schools and 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 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.

Career Transition Award (K99/R00): To provide up to 5 years support in two phases to highly promising postdoctoral scientists to pursue research relevant to the Institute. The K99 phase consists of 1 to 2 years mentored support followed by up to 3 years of independent

support (R00) contingent on securing an independent research position. Award recipients will be expected to compete successfully for independent research grant support from the NIH or other Institutions during the independence phase to ensure continued support and a smooth transition to independence.

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): 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.

Pilot Project Award (SC2): To support underrepresentative minorities who are at the beginning stages of a research career and interested in testing a new idea or generating preliminary data, or who are more experienced investigators and interested in switching to a different field of research.

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.

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.

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 T35M): 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 Inter-Agency 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
BEE	Board of Extramural Experts
CABG	coronary artery bypass graft
CAMP–CS/ Phase II	Childhood Asthma Management Program–Continuation Study/Phase II
CARDIA	Coronary Artery Risk Development in Young Adults
CARE	Childhood Asthma Research and Education Network
CDC	Centers for Disease Control and Prevention
CF	cystic fibrosis
CHD	coronary heart disease
CHS	Cardiovascular Health Study
CIHR	Canadian Institutes of Health Research
COPD	chronic obstructive pulmonary disease
CORAL	Cardiovascular Outcomes in Renal Atherosclerotic Lesions
CSCC	Comprehensive Sickle Cell Centers
CTOT	Clinical Trials in Organ Transplantation
CVD	cardiovascular diseases
DARD	Division for the Application of Research Discoveries
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
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
GENTAC	Genetically Triggered Thoracic Aortic Aneurysms and Other Cardiovascular Conditions
GOCADAN	Genetics of Coronary Artery Disease in Alaska Natives
GTRP	Gene Therapy Resource Program
HAT	Home Automatic External Defibrillator Trial
HBCU	historically black college and university
HBV	hepatitis B virus
HCHS	Hispanic Community Health Study
HCV	hepatitis C virus
HDL	high-density lipoprotein
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
JHS	Jackson Heart Study
JNC V	Fifth Report of the Joint National Committee on the Detection, Evaluation, and Treatment of High Blood Pressure
LDL	low-density lipoprotein
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
NIAMS	National Institute of Arthritis and Musculoskeletal and Skin Diseases
NICHD	National Institute of Child Health and Human Development

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
OAT	Occluded Artery Trial
OEI	Obesity Education Initiative
OPEC	Office of Prevention, Education, and Control
ORTMH	Office of Research Training and Minority Health
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
PROGENI	Programs in Gene by Environment Interaction
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
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 Adults With Ejection Fraction Congestive Heart Failure
WHI	Women's Health Initiative
WLM	Weight Loss Maintenance

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