FACT BOOK

FISCAL YEAR

2005

FEBRUARY 2006

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. Directory of Personnel*

Office of the Director	Bldg.	Room	Phone	MSC†‡
Director, **Elizabeth G. Nabel, M.D.**	31	5A48	496–5166	2486
Acting Deputy Director, **Carl A. Roth, Ph.D., LL.M.**	31	5A07	496–6331	2482
Assistant to the Director and Deputy Ethics Counselor, NHLBI, **Sheila Pohl**	31	5A48	496–6471	2486
Associate Director for Administrative Management, **Donald P. Christoferson**	31	5A48	496–2411	2490
Associate Director for Scientific Program Operation, **Carl A. Roth, Ph.D., LL.M.**	31	5A03	496–6331	2482
Associate Director for Prevention, Education, and Control, **Gregory J. Morosco, Ph.D., M.P.H.**	31	4A10	496–5437	2480
Associate Director for Minority Health Affairs, **Helena O. Mishoe, Ph.D., M.P.H.**	RKL2§	8188	451–5081	7913
Office of Administrative Management				
Director/Executive Officer, **Donald P. Christoferson**	31	5A48	496–2411	2490
Administrative Officer, **Rebecca Ellett-Tener**	31	5A33	496–5931	2490
Management Policy and Administrative Services Branch				
Chief, **Marilyn Jackson**	31	5A33	496–5931	2490
Freedom of Information/Privacy Act				
Coordinator, **Suzanne Freeman**	31	5A33	496–9737	2490
Financial Management Branch				
Chief, **Sandra Gault**	31	5A21	496–4653	2490
Extramural Administrative Management Branch				
Chief, **Loretta L. Barnes**	RKL2	7026	435–6373	7921
Intramural Administrative Management Branch				
Chief, **Gary Unger**	10	7N220	451–0892	1670
Office of Workforce Relations				
Chief, **Mishyelle I. Croom**	31	5A28	496–1763	2490
National Center on Sleep Disorders Research				
Director, **Carl E. Hunt, M.D.**	RKL1**	6022	435–0199	7993
Administrative Officer, **Stacey A. Long**	RKL2	7026	435–6373	7921
Women's Health Initiative				
Director, **Barbara M. Alving, M.D.**	31	3B11	496–5793	2128
Administrative Officer, **Charlotte M. Wiltshire**	RKL2	7026	435–6373	7921
Office of Minority Health Affairs				
Director, **Helena O. Mishoe, Ph.D., M.P.H.**	RKL2	8188	451–5081	7913
Administrative Officer, **Stacey A. Long**	RKL2	7026	435–6373	7921
Office of Prevention, Education, and Control				
Director, **Gregory J. Morosco, Ph.D., M.P.H.**	31	4A10	496–5437	2480
Administrative Officer, **Rebecca Ellett-Tener**	31	5A33	496–5931	2490

* Current as of October 31, 2005. For locating personnel not listed, the general information number is 301–496–4000. All listed phone numbers are in area code 301. The Personnel Directory, which is periodically updated throughout the year, is located on the NHLBI Home Page under About NHLBI.
† MSC—Mail Stop Code.
‡ Full mailing address formats are located at the end of this chapter.
§ RKL2—Rockledge II Building.
** RKL1—Rockledge I Building.

Office of the Director (continued)	**Bldg.**	**Room**	**Phone**	**MSC**
Health Communications and Information Science				
Senior Manager, **Terry C. Long**	31	4A10	496–0554	2480
International Programs				
Senior Manager, **Vacant**	31	4A10	496–5375	2480
Program Operations				
Senior Manager, **Nancy J. Poole, M.B.A.**	31	4A10	496–5437	2480
Public Health Program Development				
Senior Manager, **Robinson Fulwood, Ph.D., M.S.P.H.**	31	4A10	496–0554	2480
NHLBI Nutrition Coordinator, **Darla E. Danford, D.Sc., M.P.H.**	31	4A10	496–0554	2480
National High Blood Pressure Education Program				
Coordinator, **Edward J. Roccella, Ph.D., M.P.H.**	31	4A10	496–1051	2480
National Cholesterol Education Program				
Coordinator, **James I. Cleeman, M.D.**	31	4A10	496–1051	2480
National Asthma Education and Prevention Program				
Coordinator, **Diana K. Schmidt, M.P.H.**	31	4A10	496–1051	2480
National Heart Attack Alert Program				
Coordinator, **Mary McDonald Hand, M.S.P.H., R.N.**	31	4A10	496–1051	2480
National Obesity Education Initiative				
Coordinator, **Karen Donato, M.S., R.D.**	31	4A10	496–1051	2480
NHLBI Women's Heart Health Education Initiative				
Coordinator, **Ann Taubenheim, Ph.D., M.S.N.**	31	4A10	496–4236	2480
Pediatric Cardiovascular Risk Reduction and Science Application				
Senior Medical Officer, **Rae-Ellen Kavey, M.D., M.P.H.**	31	4A10	496–1051	2480
Office of Science and Technology				
Director, **Carl A. Roth, Ph.D., LL.M.**	31	5A03	496–6331	2482
Deputy Director, **Barbara Liu, S.M.**	31	5A06	496–9899	2482
Administrative Officer, **Rebecca Ellett-Tener**	31	5A33	496–5931	2490
Program Studies and Reports Program				
Director, **Carl A. Roth, Ph.D., LL.M.**	31	5A03	496–6331	2482
Science and Special Issues Program				
Director, **Barbara Liu, S.M.**	31	5A06	496–9899	2482
Office of Public Liaison				
Acting Coordinator, **Barbara Liu, S.M.**	31	5A06	496–9899	2482
Information Resources and Technology Program				
Director, **Ralph Van Wey**	RKL1	6210	435–0119	7994
Administrative Officer, **Amy W. Sheetz**	RKL2	7026	435–6367	7921
Office of Technology Transfer and Development				
Director, **Lili M. Portilla**	RKL1	6018	402–5579	7992
Administrative Officer, **Stacey A. Long**	RKL2	7026	435–6373	7921

Division of Heart and Vascular Diseases

Director, **Stephen C. Mockrin, Ph.D.**	RKL2	9160	435–0466	7940
Deputy Director, **Sonia Skarlatos, Ph.D.**	RKL2	9158	435–0477	7940
Special Assistant for Clinical Studies, **David J. Gordon, M.D.**	RKL2	9152	435–0515	7940
Research Training and Special Programs Scientific Research Group				
Leader, **Jane Scott, Sc.D., M.S.N.**	RKL2	9135	435–0535	7940
Administrative Officer, **Lisa A. Freeny**	RKL2	7110	435–6373	7921
Clinical and Molecular Medicine Program				
Director, **Alice Mascette, M.D.**	RKL2	9166	435–0555	7940

Division of Heart and Vascular Diseases (continued)	**Bldg.**	**Room**	**Phone**	**MSC**
Associate Director, **Susan Old, Ph.D.**	RKL2	9137	435–1802	7940
Cardiovascular Medicine Scientific Research Group				
Leader, **Patrice Desvigne-Nickens, M.D.**	RKL2	9178	435–0515	7940
Bioengineering and Genomic Applications Scientific Research Group				
Leader, **Sunil Pandit, Ph.D.**	RKL2	9144	435–0513	7940
Heart Research Program				
Acting Director, **Denis Buxton, Ph.D.**	RKL2	9188	435–0504	7940
Associate Director, **Charlene A. Schramm, Ph.D.**	RKL2	9200	435–0510	7940
Arrhythmias, Ischemia, and Sudden Cardiac Death Scientific Research Group				
Leader, **David A. Lathrop, Ph.D.**	RKL2	9192	435–0504	7940
Heart Development, Function, and Failure Scientific Research Group				
Leader, **Gail D. Pearson, M.D., Sc.D.**	RKL2	9202	435–0510	7940
Vascular Biology Research Program				
Director, **Eser Tolunay, Ph.D.**	RKL2	10198	435–0545	7956
Associate Director, **Deborah Applebaum-Bowden, Ph.D.**	RKL2	10190	435–0545	7956
Atherosclerosis Scientific Research Group				
Leader, **Momtaz Wassef, Ph.D.**	RKL2	10196	435–0550	7956
Hypertension Scientific Research Group				
Leader, **Paul A. Velletri, Ph.D.**	RKL2	10202	435–0560	7956
Division of Lung Diseases				
Director, **James P. Kiley, Ph.D.**	RKL2	10122	435–0233	7952
Deputy Director, **Carol E. Vreim, Ph.D.**	RKL2	10120	435–0233	7952
Administrative Officer, **Amy W. Sheetz**	RKL2	7026	435–6373	7921
Airway Biology and Disease Program				
Director, **Gail G. Weinmann, M.D.**	RKL2	10210	435–0202	7952
Senior Scientific Advisor, **Susan P. Banks-Schlegel, Ph.D.**	RKL2	10220	435–0202	7952
Asthma Scientific Research Group				
Leader, **Patricia Noel, Ph.D.**	RKL2	10222	435–0202	7952
Chronic Obstructive Pulmonary Disease/Environment Scientific Research Group				
Leader, **Thomas Croxton, M.D., Ph.D.**	RKL2	10208	435–0202	7952
Cystic Fibrosis Scientific Research Group				
Leader, **Susan P. Banks-Schlegel, Ph.D.**	RKL2	10220	435–0202	7952
Sleep and Neurobiology Scientific Research Group				
Leader, **Michael J. Twery, Ph.D.**	RKL2	10116	435–0202	7952
Training and Special Programs Scientific Research Group				
Leader, **Ann Rothgeb**	RKL2	10124	435–0202	7952
Lung Biology and Disease Program				
Director, **Dorothy B. Gail, Ph.D.**	RKL2	10100	435–0222	7952
Senior Scientific Advisor, **Andrea Harabin, Ph.D.**	RKL2	10108	435–0222	7952
Acquired Immunodeficiency Syndrome/Tuberculosis Scientific Research Group				
Leader, **Hannah H. Peavy, M.D.**	RKL2	10110	435–0222	7952

Division of Lung Diseases (continued)	**Bldg.**	**Room**	**Phone**	**MSC**
Acute Lung Injury/Critical Care Scientific Research Group				
Leader, **Andrea Harabin, Ph.D.**	RKL2	10108	435–0222	7952
Developmental Biology and Pediatric Pulmonary Diseases Scientific Research Group				
Leader, **Mary Anne Berberich, Ph.D.**	RKL2	10102	435–0222	7952
Immunology/Fibrosis Scientific Research Group				
Leader, **Herbert Y. Reynolds, M.D.**	RKL2	10112	435–0222	7952
Lung Cell and Vascular Biology Scientific Research Group				
Leader, **Elizabeth Denholm, Ph.D.**	RKL2	10114	435–0222	7952
Training and Special Programs Scientific Research Group				
Leader, **Sandra Hatch, M.D.**	RKL2	10104	435–0222	7952
Division of Blood Diseases and Resources				
Director, **Charles Peterson, M.D., M.B.A.**	RKL2	10160	435–0080	7950
Deputy Director, **Liana Harvath, Ph.D.**	RKL2	10170	435–0080	7950
Senior Program Analyst, **Susan Pucie**	RKL2	10166	435–0079	7950
Special Assistant, **Henry Chang, M.D.**	RKL2	10158	435–0080	7950
Clinical Trials Specialist, **Elizabeth Wagner, M.P.H.**	RKL2	10159	435–0080	7950
Administrative Officer, **Kathryn Lightbody**	RKL2	7026	435–6373	7921
Blood Diseases Program				
Director, **Blaine Moore, Ph.D.**	RKL2	10162	435–0050	7950
Hemoglobinopathies and Genetics Scientific Research Group				
Leader, **Greg Evans, Ph.D.**	RKL2	10152	435–0055	7950
Research Training, **Ellen Werner, Ph.D.**	RKL2	10156	435–0050	7950
Thrombosis and Hemostasis Program				
Director, **Pankaj Ganguley, Ph.D.**	RKL2	10176	435–0070	7950
Thrombosis and Hemostasis Scientific Research Group				
Leader, **Rebecca Link, Ph.D.**	RKL2	10178	435–0070	7950
Research Training, **Rita Sarka, Ph.D.**	RKL2	10165	435–0050	7950
Blood Resources Program				
Director, **Jean Henslee-Downey, M.D.**	RKL2	10138	435–0065	7950
Transfusion Medicine and Cellular Therapeutics Scientific Research Group				
Leader, **George J. Nemo, Ph.D.**	RKL2	10142	435–0065	7950
Research Training, **Traci Mondoro, Ph.D.**	RKL2	10135	435–0065	7950
Small Business Research, **Phyllis Mitchell, M.S.**	RKL2	10163	435–0075	7950
Division of Epidemiology and Clinical Applications				
Director, **Peter Savage, M.D.**	RKL2	8100	435–0422	7938
Deputy Director, **Diane Bild, M.D.**	RKL2	8104	435–0422	7938
Senior Advisor, **Jeffrey Cutler, M.D.**	RKL2	8102	435–0433	7938
Administrative Officer, **Charlotte Wiltshire**	RKL2	7026	435–6373	7921
Office of Biostatistics Research				
Director, **Nancy L. Geller, Ph.D.**	RKL2	8210	435–0434	7938
Clinical Applications and Prevention Program				
Director, **Denise Simons-Morton, M.D., Ph.D.**	RKL2	8130	435–0414	7936
Clinical Prevention and Translation Scientific Research Group				
Leader, **Lawrence Fine, M.D., Dr.P.H.**	RKL2	8138	435–0377	7936

Division of Epidemiology and Clinical Applications (continued)	**Bldg.**	**Room**	**Phone**	**MSC**
Clinical Trials Scientific Research Group				
Leader, **Michael Domanski, M.D.**	RKL2	8146	435–0399	7936
Behavioral Medicine and Prevention Scientific Research Group				
Leader, **Peter G. Kaufmann, Ph.D.**	RKL2	8118	435–0404	7936
Epidemiology and Biometry Program				
Acting Director, **Paul D. Sorlie, Ph.D.**	RKL2	8176	435–0707	7934
Analytical Resources Scientific Research Group				
Leader, **Paul D. Sorlie, Ph.D.**	RKL2	8176	435–0707	7934
Genetic Epidemiology Scientific Research Group				
Leader, **Richard Fabsitz, Ph.D.**	RKL2	8164	435–0444	7934
Field Studies and Clinical Epidemiology Scientific Research Group				
Leader, **Jean Olson, M.D., M.P.H.**	RKL2	8154	435–0701	7934
Framingham Epidemiology Research Unit				
Leader, **Daniel Levy, M.D.**	73 Mt. Wayte Avenue, Suite 2 Framingham, MA 01702–5827 508–935–3458			
Jackson Heart Study				
Leader, **Evelyn Walker, M.D.**	Jackson Medical Mall 350 West Woodrow Wilson Drive Jackson, MS 39213 601–368–4654			

Division of Extramural Affairs

Director, **Deborah P. Beebe, Ph.D.**	RKL2	7100	435–0260	7922
Deputy Director, **Robert Musson, Ph.D.**	RKL2	7216	435–0266	7922
Committee Management Officer, **Kathryn M. Valeda**	RKL2	7220	435–0255	7922
Administrative Officer, **Veronica M. Vanwagner**	RKL2	7112	435–6373	7921
Review Branch				
Chief, **Valerie Prenger, Ph.D.**	RKL2	7214	435–0270	7924
Referral Officer, **Roy White, Ph.D.**	RKL2	7202	435–0287	7924
Heart/Lung Scientific Review Group				
Leader, **William Johnson, Ph.D.**	RKL2	7178	435–0725	7924
Vascular/Blood Scientific Review Group				
Leader, **Jeffrey H. Hurst, Ph.D.**	RKL2	7208	435–0303	7924
Clinical Studies and Training Scientific Review Group				
Leader, **Patricia Haggerty, Ph.D.**	RKL2	7194	435–0288	7924
Office of Acquisitions				
Chief, **John C. Taylor**	RKL2	6100	435–0330	7902
Deputy Chief, **Pamela S. Lew**	RKL2	6106	435–0340	7902
Blood Diseases and Resources/NIAMS Branch				
Chief, **Joanna Magginas**	RKL2	6136	435–0355	7902
Heart, Lung, and Vascular Diseases Branch				
Chief, **Pamela S. Lew**	RKL2	6106	435–0340	7902
Epidemiology and Clinical Applications/ Women's Health Initiative Branch				
Chief, **Patricia A. Smith**	RKL2	6126	435–0345	7902
Procurement Branch				
Chief, **Debra C. Hawkins**	RKL2	6150	435–0366	7902

Division of Extramural Affairs (continued)	**Bldg.**	**Room**	**Phone**	**MSC**
Grants Operations Branch				
Chief, **Suzanne A. White**	RKL2	7160	435–0144	7926
Deputy Chief, **Raymond Zimmerman**	RKL2	7174	435–0144	7926
Clinical and Molecular and Vascular Biology Grants Management Section				
Chief, **David Reiter**	RKL2	7172	435–0177	7926
Lung Diseases Grants Management Section				
Chief, **Robert A. Pike**	RKL2	7154	435–0166	7926
Blood Diseases and Resources Grants Management Section				
Chief, **Robert Vinson, Jr.**	RKL2	7156	435–0166	7926
Epidemiology and Clinical Application Grants Management Section				
Chief, **Teresa F. Marquette**	RKL2	7152	435–0177	7926
Heart Research and Training Grants Management Section				
Chief, **Mary S. Baylor**	RKL2	7146	435–0166	7926

Division of Intramural Research

Office of the Scientific Director

Director, **Robert S. Balaban, Ph.D.**	10CRC*	4-1581	496–2116	1458
Intramural Administrative Management Branch				
Chief, **Gary Unger**	10	7N214	451–0892	1686
Office of the Clinical Director				
Director, **Richard O. Cannon III, M.D.**	10CRC	4-1581	496–9895	1458
Office of Clinical Affairs				
Associate Director, **Maria Stagnitto, M.S.N.**	10	7N210	496–2295	1755
Office of Education				
Chief, **Herbert Geller, Ph.D.**	10	8C106	451–9940	1755
Cardiology Branch				
Chief, **Toren Finkel, M.D., Ph.D.**	10CRC	5-3332	402–4081	1454
Hermatology Branch				
Chief, **Neal Young, M.D.**	10CRC	3-5142	496–5093	1652
Flow Cytometry Core (FACS)				
Head, **Philip McCoy, Ph.D.**	10	4A07	451–8824	1357
Pulmonary Critical Care Medicine Branch				
Chief, **Joel Moss, M.D., Ph.D.**	10	6D03	496–1597	1590
Vascular Medicine Branch				
Chief, **Mark Gladwin, M.D.**	10CRC	5-5142	435–2310	1476
Biochemistry and Biophysics Center				
Director, **Boon Chock, Ph.D.**	50	2134	496–2073	8012
Cell Biology and Physiology Center				
Director, **Edward D. Korn, Ph.D.**	50	2517	496–1616	8017
Bioinformatics Core				
Head, **Eric Billings, Ph.D.**	10	4A15	496–6520	1348
Light Microscopy Core				
Head, **Christian Combs, Ph.D.**	10	6N309	496–3236	1623
Lipid Trafficking Core				
Head, **Edward Neufeld, Ph.D.**	10	7N116	496–3195	0850
Proteomics Core				
Head, **Rong-Fong Shen, Ph.D.**	10	6C208	594–1060	1597

* 10CRC—Buidling 10 Clinical Research Center

Division of Intramural Research (continued)	**Bldg.**	**Room**	**Phone**	**MSC**
Genetics and Development Biology Center				
Director, **Cecilia Lo, Ph.D.**	50	4537	451–8041	8019
Animal MRI/Imaging Core				
Head, **Stasia Anderson, Ph.D.**	10	2N240	401–0908	1518
Pathology Core				
Head, **Zu-Xi Yu, Ph.D.**	10	2N240	496–5035	1518
Transgenic Core				
Head, **Chengyu Liu, Ph.D.**	50	3305	435–5034	8018
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 14E
Full Name
NHLBI, NIH
Building 14E, Room ____
14 Service Road South 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 research, 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.

As shown on page 10, the programs of the NHLBI are implemented through five extramural program units: the Division of Heart and Vascular Diseases (DHVD), the Division of Lung Diseases (DLD), the Division of Blood Diseases and Resources (DBDR), the Division of Epidemiology and Clinical Applications (DECA), and the National Center on Sleep Disorders Research (NCSDR); and one intramural unit, the Division of Intramural Research (DIR). Although the NHLBI has primary responsibility for

National Heart, Blood Vessel, Lung, and Blood Diseases and Blood Resources Program

Heart and Vascular Diseases

Heart Research
Heart Development
Cardiac Function and Heart Failure
Ischemic Heart Disease
Arrhythmias and Sudden Cardiac Death

Vascular Biology Research
Atherosclerosis
Hypertension
Biology and Pathophysiology of Blood Vessels
Gene Therapy for Prevention and Treatment of Vascular Diseases

Clinical and Molecular Medicine
Cardiovascular Medicine
Bioengineering/Systems
Genomic and Proteomic Applications
Imaging/Nanotechnology
Bioinformatics

Lung Diseases

Airway Biology and Disease
Asthma
Chronic Obstructive Pulmonary Disease (COPD) and Environmental Lung Diseases
Cystic Fibrosis (CF)
Neurobiology and Sleep

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

Blood Diseases and Resources

Blood Diseases
Sickle Cell Disease (SCD)
Thalassemia
Erythropoiesis
Red Cells
Thrombosis and Hemostasis
Hemophilia and Other Bleeding Disorders
Hematologic Immune Disorders

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

Epidemiology and Clinical Applications

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

Epidemiology and Biometry
Field Studies and Clinical Epidemiology
Analytical Resources
Genetic Epidemiology

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

Women's Health Initiative

Intramural Research

Clinical Research
Cardiology
Cardiothoracic Surgery
Hematology
Pulmonary/Critical Care Medicine

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

the WHI, it is run by a consortium that includes the National Cancer Institute (NCI), the National Institute on Aging (NIA), and the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS). The Divisions and the Center pursue their own scientific missions but cooperate in areas of common interest. The extramural Divisions and the NCSDR 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 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 Division and Center programs, as well as the WHI, follow.

Division of Heart and Vascular Diseases

The DHVD plans and directs a coordinated research program on the causes of heart and vascular diseases and on their prevention, diagnosis, and treatment. Fundamental biomedical research, including cutting-edge areas such as genomics, proteomics, nanotechnology, cell-based therapeutics, and gene therapy, is emphasized. Multidisciplinary programs are supported to advance basic knowledge of disease and to generate the most effective methods of clinical management and prevention. Clinical trials are an important part of the research program; they provide an opportunity to test and apply promising preventive or therapeutic measures.

The Division is organized into three major research programs:

- Heart Research Program
- Vascular Research Program
- Clinical and Molecular Medicine Program

and the Research Training and Special Programs Scientific Research Group (SRG).

Heart Research Program

The Heart Research Program supports basic and clinical research in cardiac diseases, from embryonic life through adulthood. Targeted areas include heart development, cardiac disorders, inflammation and infectious disorders of the heart, heart transplantation, and myocardial preservation. Individual studies focus on normal and abnormal cardiac development, diabetic cardiomyopathy, gene–nutrient interactions in the pathogenesis of congenital heart defects, pathogenesis of heart failure, electrical remodeling, and various aspects of human immunodeficiency virus (HIV) infection as it relates to the heart. SCCORs support clinical collaborative research in (1) cardiac dysfunction and disease and (2) pediatric heart development and disease. The Program comprises the two SRGs described below.

Heart Development, Function, and Failure SRG

The Heart Development, Function, and Failure SRG oversees a research program in heart development, cardiac function, and heart failure. It includes basic studies examining normal functional and structural development of the heart and major blood vessels, as well as the genetic, molecular, environmental, and mechanical etiology of congenital cardiovascular malformations. Clinical research networks are used to evaluate new treatment methods and management strategies for congenital malformations and acquired pediatric heart disease.

Research on cardiac function and failure focuses on fundamental mechanisms associated with the structure, function, mechanics, and bioenergetics of normal and diseased myocardium; the role of contractile proteins in the cardiovascular system; and causes of cardiac hypertrophy and the subsequent transition from hypertrophy to heart failure. Individual projects include molecular, cellular, and physiological studies of diabetic cardiomyopathy; pathogenesis of heart failure, with emphasis on apoptosis (programmed cell death), myocyte division and growth, and cell transplantation; and studies to identify modifiers of gene defects leading to hypertrophic cardiomyopathy and heart failure.

Arrhythmias, Ischemia, and Sudden Cardiac Death SRG

The Arrhythmias, Ischemia, and Sudden Cardiac Death SRG oversees a research program on cardiac arrhythmias that focuses on elucidating the mechanisms involved in control of cardiac electrical activity; determining the contribution of cardiac membrane biophysics, membrane structure and organization, ion pumps and channels, and transport and gap junction proteins to electrogenesis; and understanding the long-term control of cardiovascular function as it relates to the onset or maintenance of arrhythmias. Investigators are seeking knowledge that will lead to the development of new approaches to diagnosis, treatment, and prevention of arrhythmias.

The SRG also oversees a research program on the etiology and pathophysiology of ischemic heart disease and its consequences and control and treatment of cardiac electrical activity, rhythm, and rate, especially as they relate to sudden cardiac death. Researchers are seeking ways to improve the diagnosis and treatment of myocardial ischemia. Special attention is directed toward understanding the pathophysiology of ischemic heart disease in blacks, a population that is disproportionately affected by the disorder.

Vascular Biology Research Program

The Vascular Biology Research Program supports research in atherosclerosis, hypertension, basic vascular biology, and gene therapy for prevention and treatment of vascular diseases. Other targeted areas focus on the etiology, pathogenesis, and treatment of excess CVD in diabetes mellitus and cardiovascular complications of HIV/AIDS. SCORs support collaborative studies on

molecular medicine and atherosclerosis and the molecular genetics of hypertension. The Program comprises the two SRGs described below.

Atherosclerosis SRG

The Atherosclerosis SRG oversees a comprehensive research program on the etiology, pathogenesis, diagnosis, prevention, and treatment of atherosclerosis. Areas of emphasis include pathobiology and genetics of the vasculature; vascular growth and angiogenesis; interactions of the vascular wall with systemic and humoral factors promoting atherogenesis; and lesion progression, complication, and regression. Individual studies focus on characterization of vulnerable atherosclerotic plaque, pathogenesis of abdominal aortic aneurysms, role of homocysteinemia in atherosclerosis, mechanisms of atherosclerosis in various vascular beds, and research on atherosclerotic lesions. Additional projects target pathobiological determinants of atherosclerosis, cardiovascular complications of diabetes mellitus, vessel-wall calcification, the role of infectious agents in atherosclerosis, immunobiology of the vessel wall, obesity-associated CVD, exercise physiology, peripheral artery disease (PAD), and effect of protease inhibitors on atherosclerosis development in HIV infection. Of special interest is understanding atherosclerosis risk among minorities.

Hypertension SRG

The Hypertension SRG directs a research program to identify and characterize genes and their corresponding phenotypes involved with hypertension; elucidate regulation mechanisms associated with blood pressure control; clarify functional control of the cerebrovasculature; and identify causative factors of essential hypertension and rare forms of high blood pressure. It also seeks to determine the mechanisms by which high blood pressure increases the risk of, or occurs concomitantly with, other diseases such as kidney failure, stroke, metabolic syndrome X, obesity, diabetes mellitus, atherosclerosis, preeclampsia, and left ventricular hypertrophy. Further, it fosters studies to develop preventive strategies and interventions for hypertension, understand the biological underpinnings of salt sensitivity and the basis of target-organ damage in hypertension, and identify neurological mechanisms responsible for long-term control of blood pressure and functional neurological changes that result in essential hypertension. Attention is directed to eliminating health disparities among minorities and between men and women.

Clinical and Molecular Medicine Program

The Clinical and Molecular Medicine Program supports clinical, basic, engineering, and quantitative research on CVD and health. Areas of interest include genetics, genomics, and proteomics; engineering theory and practice applied to cardiovascular biology and medicine; informatics and simulation; computational systems; and cohort, case-control, and randomized clinical trials. Projects focus on heart failure, revascularization, renal stenting, diabetes management, outcome improvement in resuscitation, reduction in cardiovascular health disparities, minority and women's health, and the implantable artificial heart. The program comprises the two SRGs described below.

Cardiovascular Medicine SRG

The Cardiovascular Medicine SRG directs a research program on CVD in adult and pediatric patients. It examines the role of lipid interventions, nutrition, and exercise in preventing heart disease. Areas of emphasis include development of treatments or new applications of existing medical and surgical strategies for acute and chronic ischemic heart disease; dietary and medical management of dyslipidemia; quantitative measurement of atherosclerosis; diagnosis and management of arrhythmias; resuscitation; cardiomyopathies of different etiologies (e.g., ischemic, valvular, metabolic, HIV-related, other infectious); congenital malformations; peripheral vascular disease; restenosis after revascularization procedures; cardiovascular applications of radiotherapy; and cardiovascular dysfunction in long-term pediatric cancer survivors.

Bioengineering and Genomic Applications SRG

The Bioengineering and Genomic Applications SRG directs an interdisciplinary research program that applies engineering theory and practice to increase knowledge at the genetic, molecular, cellular, tissue, and organ level and examines materials, processes, and devices for the cardiovascular system. Individual projects focus on innovative ventricular assist systems, implantable total artificial hearts, genetically enhanced cardiovascular implants, nanotechnology, magnetic resonance angiography, physical stress and strain, micromechanics, self-assembly, mathematical models, simulation and systems, imaging, biomaterials, tissue engineering, and therapeutic devices.

Division of Lung Diseases

The DLD plans and directs a coordinated research program on the causes and progression of lung diseases and on their prevention, diagnosis, and treatment. Areas of interest include the biology and function of the respiratory system, fundamental mechanisms associated with specific pulmonary disorders, and development of new treatment strategies for patients. SCORs support collaborative studies on cellular and molecular mechanisms of asthma, airway biology and pathogenesis of CF, the pathobiology of lung development, and the pathobiology of fibrotic lung disease; a SCCOR supports collaborative translational research in acute lung injury. Demonstration and education projects to transfer basic research and clinical findings to health care professionals and patients, as well as training and career development programs for individuals interested in furthering their professional abilities in lung diseases research, also are important activities.

The Division is organized into two major research programs:

- Airway Biology and Disease Program
- Lung Biology and Disease Program.

Airway Biology and Disease Program

The Airway Biology and Disease Program supports basic and clinical research, education, and training related to asthma, COPD, CF, control of breathing, bronchiolitis, respiratory neurobiology, sleep, and other adult airway diseases. It comprises the four research SRGs described below and a Training and Special Programs SRG, which manages training and career development in lung diseases research for individuals at all stages of their professional development.

Asthma SRG

The Asthma SRG oversees a broad research program in asthma. Basic research focuses on elucidating the etiology and pathophysiology of the disease. Studies include elucidating the cellular and molecular mechanisms associated with development, exacerbation, and persistence of asthma and the effect of the environment on them; identifying susceptibility genes that influence development, progression, outcome, and response to treatment in different racial groups; determining the differences between the pathophysiology of severe asthma and mild-to-moderate asthma; and investigating the role of the immune system, its function in early life, and its influence on asthma development.

Clinical research focuses on improving asthma management and reducing health disparities in asthma that exist between whites and other ethnic groups, as well as economically disadvantaged populations. Two asthma networks have been established to assess new treatment strategies and ensure rapid dissemination of research findings to health care professionals. The Division has established cooperative partnerships between minority-serving institutions and research-intensive institutions to examine factors that contribute to health disparities and to develop strategies for their elimination. The purpose of the partnerships is to conduct collaborative research on asthma disparities and provide reciprocal training experiences to enhance research opportunities and capabilities and enrich the cultural sensitivity at both institutions.

Chronic Obstructive Pulmonary Disease/Environment SRG

The COPD/Environment SRG oversees research on the underlying causes of COPD and improving its treatment and management. Studies include examining the role of inflammation in the pathogenesis of COPD; searching for genes that may make some individuals more susceptible to the development of the disorder; identifying and characterizing biomarkers of COPD presence, severity, and exacerbation; evaluating treatment strategies; and applying gene therapy to correct the defective gene or to introduce the functional gene for alpha-1 antitrypsin in deficient individuals with familial emphysema.

A clinical research network has been established to conduct clinical trials of promising therapies for COPD that may reduce the frequency and severity of disease exacerbation. Additionally, a program was initiated to provide researchers with lung tissue specimens that were removed for medical reasons and are not needed for diagnostic purposes.

Cystic Fibrosis SRG

The CF SRG oversees basic and clinical research related to the origins and control of infections and inflammatory and immune responses in the lungs of CF patients, loss of CF transmembrane conductance regulation on development of CF, effects of other genes on its manifestation, and genetic and metabolic defects underlying pulmonary complications associated with CF.

Developing new genetic, pharmacologic, and nonpharmacologic (e.g., gene transfer) treatments also is an area of emphasis.

Sleep and Neurobiology SRG

The Sleep and Neurobiology SRG oversees sleep research on sleep and circadian neurobiology, sleep regulation, health consequences, and treatment of sleep disorders, sleep disordered breathing, and ventilatory control.

Lung Biology and Disease Program

The Lung Biology and Disease Program supports research, education, and training programs in lung cell and vascular biology; developmental biology and pediatric lung diseases; acute lung injury and critical care medicine; interstitial lung diseases, including pulmonary fibrosis; and AIDS and TB. It comprises the five research SRGs described below and a Training and Special Programs SRG that manages training and career development in lung diseases research for individuals at all stages of their professional development.

Acquired Immunodeficiency Syndrome/Tuberculosis SRG

The AIDS/TB SRG oversees a research program on the basic pathogenetic mechanisms involved in HIV-related lung disorders, especially TB–HIV dual infection and animal and mathematical models to gain information that may lead to new treatment strategies. Many of the studies employ genetic, molecular, and cellular approaches. Additional areas of interest include cardiopulmonary complications of HIV infection in infants, children, and adults; pathobiology of TB and *Pneumocystis carinii* and basic cell biology of pulmonary manifestation of AIDS; lung-specific drug delivery systems for enhanced TB treatment; behavioral interventions for control of TB; and educational programs to improve training in TB.

Acute Lung Injury/Critical Care SRG

The Acute Lung Injury/Critical Care SRG oversees research on the etiology and molecular and cellular pathogenesis of acute respiratory distress syndrome (ARDS). It supports an ARDS clinical network to evaluate therapeutic strategies such as pulmonary artery catheterization, fluid management, and use of anti-inflammatory agents, including corticosteroids, in patients with the disorder and those at risk. Other areas of focus include basic studies on the pathogenesis of acute respiratory syndrome (SARS) in the lung and studies to improve the diagnosis, treatment, and outcome of critically ill patients with lung injury.

Developmental Biology and Pediatrics SRG

The Developmental Biology and Pediatrics SRG oversees research on normal lung development and on factors that may contribute to its abnormal development such as prenatal and postnatal infections and reactive inflammation. Additional areas of emphasis include understanding the regulation of lung alveoli development in order to design new treatments for lung diseases, creating a molecular profile of bronchopulmonary dysplasia to advance understanding of the condition and lead to effective clinical intervention, evaluating the safety and efficacy of nitric oxide in preventing and treating chronic lung disease in newborn infants, and evaluating the efficacy of nasal continuous positive airway pressure compared with conventional ventilation, with and without surfactant, in the management of premature newborns.

Immunology/Fibrosis SRG

The Immunology/Fibrosis SRG oversees research on interstitial lung diseases, such as sarcoidosis, idiopathic pulmonary fibrosis (IPF), and lymphangioleiomyomatosis (LAM), which are characterized by chronic inflammation and progressive fibrosis of the lung alveolar walls and surrounding tissue. Specific projects focus on elucidating the cellular and molecular mechanisms of lung inflammation and fibrosis; identifying potential targets and agents for IPF therapy; establishing an IPF network, identifying genetic factors that influence sarcoidosis in blacks and genes that increase susceptibility to pulmonary fibrosis; translating basic research findings into clinical applications for LAM; and improving allograft function after lung transplantation.

Lung Cell and Vascular Biology SRG

The Lung Cell and Vascular Biology SRG oversees research on the molecular and cellular biology of epithelial and endothelial cells of the alveoli and the lung surfactant system. Additional areas of interest encompass studies on regulation of the pulmonary vasculature, including cell growth and signaling; cellular and molecular mechanisms of primary pulmonary hypertension; identification of genes related to lung function; and development of new methods to deliver drugs via lung epithelial cells.

Division of Blood Diseases and Resources

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

The Division is organized into three major programs:

- Blood Diseases Program
- Thrombosis and Hemostasis Program
- Blood Resources Program.

Blood Diseases Program

The Blood Diseases Program supports research and training in nonmalignant disorders, including anemias, SCD, and thalassemia. It also supports studies on malaria, iron overload and erythropoiesis, and red cells. The Program comprises one research SRG described below and a Research Training Group that manages training and career development in blood diseases research for individuals at all stages of their professional development.

Hemoglobinopathies and Genetics SRG

The Hemoglobinopathies and Genetics SRG oversees a comprehensive program focusing on reducing morbidity and mortality caused by disorders of the hematopoietic system and preventing their occurrence. Diseases include SCD, thalassemia, Fanconi anemia, and Diamond-Blackfan anemia.

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 SRG oversees a program of Comprehensive Sickle Cell Centers which collectively form a SCD clinical research network. Individually, each center conducts basic and clinical research, delivers state-of-the-art patient care, offers educational activities for patients and health professionals, performs community outreach, and provides genetic counseling services.

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

Thrombosis and Hemostasis Program

The Thrombosis and Hemostasis Program supports research and training in hemostasis, thrombosis, and endothelial cell biology. Areas of interest include gene transfer, clinical proteomics, inflammation and thrombosis, coagulation activation, autoimmune disease, and thrombotic complications of obesity, diabetes, and cancer. The Program comprises one research SRG described below and a Research Training Group that manages training and career development related to thrombosis and hemostasis.

Thrombosis and Hemostasis SRG

The Thrombosis and Hemostasis SRG oversees a comprehensive program of basic research, clinical studies, and technology development in hemostasis, thrombosis, and endothelial cell biology, with a focus on understanding the pathogenesis of both arterial and venous thrombosis in order to improve 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 treating thrombotic and thromboembolic disorders. SCORs support collaborative studies on hemostatic and thrombotic disorders.

Finding an effective treatment for hemophilia is another priority. Bleeding disorders associated with defects in coagulation proteins or abnormal platelet function, such as the immune thrombocytopenias, also are being studied.

Blood Resources Program

The Blood Resources Program supports research and research training in transfusion medicine, stem cell biology and disease, clinical cellular medicine, and blood

supply adequacy and safety. The Program is organized into one SRG described below.

Transfusion Medicine and Cellular Therapeutics SRG

The Transfusion Medicine and Cellular Therapeutics SRG supports research on the use, safety, and availability of blood and blood components for transfusion and cellular therapies. Areas of interest in transfusion medicine include transmission of disease through transfusion, development of methods to detect and inactivate viruses in donated blood, improvement of blood donor screening procedures, and emerging diseases that may be transmitted by blood transfusions. Also supported are basic and clinical investigations related to transfusion immunobiology, focusing on graft-versus-host disease, graft-versus-leukemia effect, and dendritic cell therapies.

The SRG oversees research on hematopoiesis, stem cell biology and diseases, and cellular therapies. Areas of major focus are determining the factors that cause stem cells to start and stop dividing, move throughout the body, and lodge in a specific place, and understanding the fundamentals of stem cell biology that will lead to cell-based therapies.

The Program also supports two clinical research networks to promote efficient comparison of innovative treatment strategies—one for patients undergoing blood or marrow transplantation and the other for patients with hemostatic disorders, such as idiopathic thrombocytopenia and thrombotic thrombocytopenic purpura. SCORs support collaborative studies on hematopoietic stem cell biology and transfusion biology and medicine.

Division of Epidemiology and Clinical Applications

The DECA supports clinical research on the causes, prevention, and treatment of cardiovascular, lung, and blood diseases and sleep disorders. The Division oversees a broad array of epidemiological studies (including field studies, genetic epidemiology, and clinical epidemiology); clinical trials of interventions to prevent and treat disease (particularly chronic CVD and conditions); demonstration and education research; and basic and applied behavioral studies. Research often focuses on defined populations (e.g., minorities, occupational groups, school children, and health professionals) and community settings. For planning and evaluation purposes, the Division provides statistics on cardiovascular, lung, and blood diseases from national data and cohort studies.

The Division is organized into two major research programs:

- Clinical Applications and Prevention Program
- Epidemiology and Biometry Program

and an Office of Biostatistics Research.

Clinical Applications and Prevention Program

The Clinical Applications and Prevention Program supports research and research training on the effects of specific clinical and/or behavioral interventions for prevention and treatment of heart and vascular disease. Research includes efficacy studies to determine whether specific interventions improve disease outcomes under rigorously controlled and ideal circumstances, effectiveness studies to determine whether specific interventions result in favorable outcomes in more applied settings, and translational studies that test interventions to improve the delivery of proven approaches in clinical or public health settings. The Program is organized into the three SRGs described below.

Behavioral Medicine and Prevention SRG

The Behavioral Medicine and Prevention SRG addresses psychological, social, cultural, lifestyle, and other behavioral factors that influence disease etiology, pathophysiology, prevention, and treatment. Included are studies of basic behavioral principles related to health; relationships between psychosocial and lifestyle factors and CVD risk; effects of psychosocial factors in prevention, treatment, and rehabilitation; efficacy and effectiveness of behavioral, psychosocial, or lifestyle interventions to reduce disease risk and improve risk factor levels; effects of health-promotion interventions in community settings; and methods to disseminate effective lifestyle programs to communities. Key topics include stress, depression, social support, adherence, quality of life, diet, physical activity, and obesity.

Clinical Trials SRG

The Clinical Trials SRG supports studies of new therapies for CVD. A central activity of the group is the conduct of multicenter, randomized trials to evaluate therapeutic interventions. In addition to evaluating the usefulness of specific therapies, trials are used to study disease mechanisms as the basis for future interventions. Areas of emphasis include heart failure, coronary artery disease, sudden cardiac death, and supra ventricular arrhythmias, particularly atrial fibrillation.

Clinical Prevention and Translation SRG

The Clinical Prevention and Translation SRG addresses efficacy of risk factor treatments for CVD prevention, particularly studies testing interventions that would be delivered in outpatient clinical settings if successful. Included are pharmacologic treatments of known CVD risk factors and of putative novel risk factors for primary prevention, lifestyle interventions for primary prevention delivered in clinical practice settings, and lifestyle treatments for secondary prevention. The SRG also addresses approaches to improve implementation in clinical practice settings of interventions with proven efficacy, including research on effective methods for disseminating and implementing preventive as well as treatment interventions, consistent with evidence-based guidelines, as an integral part of routine medical care.

Epidemiology and Biometry Program

The Epidemiology and Biometry Program supports research and research training in epidemiological studies of heart and vascular, lung, and blood diseases and sleep disorders in defined populations in the United States and other countries. Research includes temporal trends and population patterns in prevalence, incidence, morbidity, and mortality from heart, lung, and blood diseases; risk factors for their development and progression; genetic and environmental influences and their interactions in the development of subclinical and clinical heart, lung, and blood diseases and sleep disorders; and design and analysis of long-term observational studies. The Program is organized into the three SRGs and two research units described below.

Analytical Resources SRG

The Analytical Resources SRG is responsible for (1) conducting research in the area of biometric and epidemiologic methods and their application to studies involving the incidence of and mortality from cardiovascular, lung, and blood diseases; (2) applying research strategies using family, longitudinal, and demographic information and vital statistics to study the natural history, etiology, and epidemiology of cardiovascular, lung, and blood diseases; (3) providing the Program and the Institute with statistical and epidemiological consultation including national trends in the morbidity and mortality associated with cardiovascular, lung, and blood diseases; (4) advising the Program, the Institute, and outside investigators on the design and analysis of large prospective epidemiological studies; and (5) compiling, cataloging, and maintaining data sets and files from epidemiologic studies conducted by the Program.

Field Studies and Clinical Epidemiology SRG

The Field Studies and Clinical Epidemiology SRG conducts multicenter cohort studies of the development and progression of CVD and their risk factors in U.S. populations among people of various ages, genders, and racial groups. The SRG convenes working groups to advise on critical new research, proposes epidemiologic research with appropriate study designs, initiates epidemiologic studies, manages large and complex field studies, evaluates study proficiency and productivity, and collaborates on scientific research. The SRG advises the Program and other Divisions on clinical epidemiology, measurements of subclinical CVD, and management of complex and large field-based epidemiologic studies.

Genetic Epidemiology SRG

The Genetic Epidemiology SRG is responsible for (1) conducting research studies focused on twins, pairs of siblings, and families to elucidate genetic and environmental contributors to heart, lung, and blood diseases and to characterize gene–gene and gene–environment interactions; (2) advising the Program, the Institute, and outside investigators on the design and analysis of studies of genetically characterized individuals in epidemiologic studies; (3) promoting the collection, storage, and maintenance of blood samples in existing studies to allow genotypic characterization of study cohort members for analyses in relation to phenotypic data; and (4) maintaining inventories of existing genetic databases and recent findings from ongoing epidemiologic studies conducted by the Program.

Framingham Epidemiology Research Unit

Located in Framingham, MA, the Framingham Epidemiology Research Unit (FERU) collaborates with extramurally funded Framingham investigators to identify and pursue research opportunities in cardiovascular, lung, and blood diseases in the Framingham Cohort and Offspring Studies. FERU staff are involved in all aspects of protocol development; clinic operations; event review; research training; and development of research hypotheses, analyses, reports, and publications.

Jackson Epidemiology Research Unit

Located in Jackson, MS, the Jackson Epidemiology Research Unit (JERU) collaborates with extramurally funded Jackson investigators to identify and pursue research opportunities in cardiovascular, lung, and blood

diseases in the Jackson Heart Study. JERU staff members are involved in all aspects of protocol development; clinic operations; event review; research training; and development of research hypotheses, analyses, reports, and publications.

Office of Biostatistics Research

The Office of Biostatistics Research (OBR) provides statistical expertise to the Institute and performs diverse functions in planning, designing, implementing, and analyzing NHLBI-sponsored studies. It has primary responsibility for providing objective, statistically sound, and medically relevant solutions to problems arising in NHLBI-sponsored studies. The OBR is concerned with designing efficient studies and monitoring data from ongoing studies.

The methodological interests of the OBR concern survival analysis, longitudinal data analysis, and efficient study designs, including monitoring ongoing clinical studies for efficacy and safety. Recently the OBR has made contributions to statistical genetics and has extended its expertise to bioinformatics.

National Center on Sleep Disorders Research

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

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

In 2005, the NCSDR coordinated efforts that led to the NIH State of the Science Conference on Manifestations and Management of Chronic Insomnia in Adults, a consensus conference cosponored by the National Institute of Mental Health (NIMH) and the NIH Office of Medical Applications of Research. After considerating the scientific evidence presented, the independent panel of experts released a state-of-the-science statement on insomnia and its treatment, which can be found on the Internet at www.consensus.nih.gov.

Multidisciplinary research training programs in sleep biology and sleep disorders are being supported to ensure that highly trained scientists are available to address important gaps in the current biomedical and biological understanding of sleep, including those outlined in the 2003 National Sleep Disorders Research Plan.

The NCSDR works closely with the NHLBI Office of Prevention, Education, and Control (OPEC) on education pertaining to sleep problems and sleep disorders for physicians, other health care providers, and the general public. Information for the public about sleep apnea was updated and incorporated into the NHLBI Web-based Diseases and Conditions Index (DCI) at www.nhlbi.nih.gov/health/dci/Browse/Sleep.html.

Reaching children and adolescents with messages about sleep and sleep disorders is a priority. In 2004, the NCSDR disseminated a new high school supplemental curriculum on the biology of sleep. In 2005, it published in the June issue of *Pediatrics* a manuscript, "Excessive Sleepiness in Adolescents and Young Adults: Causes, Consequences, and Treatment Strategies," prepared by the NCSDR Working Group on Sleepiness in Adolescents/Young Adults and the American Academy of Pediatrics Committee on Adolescence.

Women's Health Initiative

The WHI, which was established by the NIH in 1991, was transferred to the NHLBI on October 1, 1997. Its mission is to address the most common causes of death, disability, and impaired quality of life in postmenopausal women. These include heart disease, breast and colorectal cancer, and osteoporosis.

The WHI is a 15-year project consisting of three major components: a randomized, controlled, clinical trial of promising but unproven approaches to prevention; an observational study to identify predictors of disease; and a study of community approaches to developing healthful behaviors.

The clinical trial and the observational study enrolled more than 161,000 women aged 50 to 79, 18.5 percent of whom are minorities. More than 68,000 women were enrolled in one of three clinical trials for 8.5 years with the goal of assessing the preventive use of hormone therapy, diet modification, and calcium and vitamin D supplements.

- The hormone therapy component focused on risks and benefits of combined estrogen (conjugated equine estrogen) and progestin (medroxyprogesterone acetate) on coronary heart disease (CHD), breast cancer, and osteoporosis risk in women with a uterus, and estrogen alone in women without a uterus.
- The dietary modification component focused on the efficacy of a diet low in fat but high in fruits, vegetables, and grains in preventing breast and colorectal cancers and heart disease.
- The calcium and vitamin D supplements component focused on the efficacy of the two nutrients in preventing fractures and reducing the risk of colorectal cancer.

Women who were ineligible or unwilling to participate in the clinical trial were encouraged to enroll in a concurrent long-term observational study that involved no specific intervention, but tracked their medical history and health habits for 8.5 years. The study was looking for predictors and biological markers—including genetic markers—for disease.

Forty clinical centers recruited postmenopausal women for the clinical trial and the observational study. Ten of the centers recruited primarily minority populations: blacks, Hispanics, Asians, Pacific Islanders, and American Indians.

Unlike the clinical trial and observation study components, the Community Prevention Study component focused on community-based strategies to persuade women, especially those of different races, ethnic groups, and socioeconomic strata, to adopt healthful behaviors. Its goal was to conduct prevention research that translates into model intervention programs, which, in turn, could be widely disseminated to communities throughout the United States. Areas of emphasis included reduction of CVD, especially among black women; peer support among minority women; environmental factors and physical activity; osteoporosis prevention, education, and outreach; diabetes care in minority women; methods to enhance physical activity; and a survey of women's attitudes regarding surgical menopause and hormone therapy. The study was completed in 2000.

On July 9, 2002, after an average of 5.6 years of follow-up, the NHLBI announced an early end to the estrogen plus progestin trial, which was scheduled to run until 2005, because the risks outweighed the benefits. Specifically, investigators discovered increased risks of invasive breast cancer, heart attacks, strokes, and blood clots in study participants on combined hormone therapy of conjugated equine estrogen and medroxyprogesterone compared with women taking placebo pills. They also found decreases in hip fractures and colon cancer in the treatment group compared with the control group. Although the actual increased risk of breast cancer or CVD for women on long-term estrogen plus progestin was small—less than one-tenth of 1 percent per year—applied to the entire population of women over several years, its potential public health impact could be significant.

In 2003, a memory substudy of the WHI found that older women taking combination hormone therapy had twice the rate of dementia, including Alzheimer's disease, compared with women who did not take the medication. The study also found that the combined therapy did not protect against development of mild cognitive impairment, a form of cognitive decline less severe than dementia.

The study of estrogen-alone hormone therapy among women who had a hysterectomy was halted at the end of February 2004 because of safety issues. Investigators found that conjugated equine estrogen resulted in no reduction in CHD risk, but increased the risk of stroke in postmenopausal women who had been followed an average of 6.8 years. The study, which was scheduled to run until March 2005, also found that estrogen-alone therapy significantly increased the risk of deep vein thrombosis, had no significant effect on the risk of breast or colorectal cancer, and reduced the risk of hip and other fractures.

The memory substudy of these women, aged 65 to 79 at the beginning of the trial, showed that older women using estrogen-alone hormone therapy could be at a slightly greater risk of developing dementia, including Alzheimer's disease, than women who do not use any menopausal hormone therapy. In addition, scientists found that estrogen alone did not prevent cognitive decline.

The clinical trials of Dietary Modification and Calcium and Vitamin D Supplements ended in March 2005 as originally planned. Research findings will be published in February 2006.

The participants of the WHI clinical trials and the observational study are partipating in an extension study, which will continue until 2010. Biologic resources (bloods and DNA) from the studies will be available to the broader scientific community in 2006.

Division of Intramural Research

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

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

The reorganized DIR includes the following four Centers and four Branches:

Biochemistry and Biophysics Center

The Biochemistry and Biophysics Center develops a global view of the molecular basis of structure–function relationships of proteins and biologically relevant molecules. It performs state-of-the-art nuclear magnetic resonance 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 stucture–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 on the molecular basis of immune processes. It studies the intracellular and signaling processes involved in the activation of lymphocytes and mast cells, investigates the mechanisms by which drugs and other agents result in allergic–autoimmune reactions, and relates the results to the development of new diagnostic and therapeutic approaches in humans.

Cardiovascular Branch

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

Hematology Branch

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

Pulmonary Critical Care Medicine Branch

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

Vascular Medicine Branch

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

Office of Prevention, Education, and Control

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

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

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

In 2004, the *Fourth Report on the Diagnosis, Evaluation, and Treatment of High Blood Pressure in Children and Adolescents* was published as a supplement to *Pediatrics*; the Institute's version of the report, along with a Pediatric Hypertension Clinical Reference Tool for Palm OS and Pocket PC, which was designed to support the use of the guidelines, can be downloaded from the NHLBI Web site.

The NHBPEP launched its "Prevent and Control High Blood Pressure: Mission Possible" campaign in 2005 to help health care and other organizations nationwide promote high blood pressure prevention and control more aggressively among their constituents and to enlist support from organizations that have not traditionally been involved with high blood pressure activities. A Web site was designed to include ideas and materials for activities that business organizations, schools, community and civic organizations, and provider groups can use to become involved.

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

In 2005, the NCEP, along with the NHLBI Obesity Education Initiative, developed *Your Guide to Lowering Your Cholesterol With TLC*, which provides advice on implementing therapeutic lifestyle changes (TLC)—diet, physical activity, and weight management—to control elevated blood LDL cholesterol levels, as well as the metabolic syndrome. It published a joint statement with the American Heart Association on the diagnosis and management of the metabolic syndrome, a cluster of cardiovascular risk factors that is associated with obesity, and developed a paper, *Trends in Serum Lipids and Lipoproteins of Adults: National Health and Nutrition*

Examination Surveys, 1960–2002, with the National Center for Health Statistics (NCHS). The paper shows that total and LDL cholesterol levels have continued to decline in the older age groups, and the percent of U.S. adults with high total cholesterol levels (240 mg/dL or above) has fallen to 17 percent, thereby meeting one of the Healthy People 2010 objectives for the Nation.

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

The NAEPP employs a number of outreach strategies. Major emphasis is placed on developing, disseminating, and implementing national guidelines on the diagnosis and management of asthma. In 2005, the NAEPP issued new treatment guidelines for managing asthma during pregnancy that emphasize the importance of controlling asthma during pregnancy not only for the well-being of the mother, but also for the healthy development of the fetus.

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

In 2005, the NHAAP continued to promote the "Act in Time to Heart Attack Signs," a campaign that creates national and local partnerships to urge physicians and allied health care providers to educate their patients about heart attack risk, warning signs, and steps to ensure early treatment and survival. Educational materials for the public and for health care providers are available from the NHLBI Web site.

The NHLBI Obesity Education Initiative (OEI) was launched in January 1991 to inform the public and health professionals about the health risks associated with overweight and obesity. Obesity is not only an independent risk factor for CVD, but also a contributor to high blood pressure, type 2 diabetes, and high blood cholesterol and is related to sleep apnea.

The NHLBI OEI employs a comprehensive strategy to mobilize, educate, and coordinate groups interested in preventing and treating overweight and obesity. One of the major NHLBI OEI prevention activities, which was conducted in collaboration with the National Recreation and Park Association, is "Hearts N' Parks," a national community-based program located in 50 at-risk communities in 11 magnet center States. In 2005, the magnet centers completed their third year of programs, which included encouraging Americans of all ages to seek a healthy weight, follow a heart healthy eating plan, and engage in regular physical activity while participating in local park and recreation department programs. The "Hearts N' Parks" Web site includes programmatic details for each magnet center for each of the 3 years.

In 2005, the NHLBI, in collaboration with the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), the National Institute of Child Health and Human Development (NICHD), and the NCI, launched "We Can!" (Ways To Enhance Children's Activity and Nutrition), a national education program to prevent overweight and obesity among youth, ages 8 to 13. Major elements of the program include partnerships and community national media, and consumer outreach. Resources are available for parents, caregivers, youth, and community groups to encourage healthy eating, increase physical activity, and reduce sedentary time at http://wecan.nhlbi.nih.gov.

Since the launch of *The Heart Truth* campaign in 2002, the NHLBI has formed an extensive cadre of community, media, and corporate partners who are supporting the Institute's goal of reaching women with critical messages about heart health and promoting the Red Dress as the national symbol for women and heart disease awareness. Outreach to women at the community level has been enhanced by *The Heart Truth* Road Show, Single City Program, and events held by First Lady Laura Bush, the campaign's national ambassador. A key focus for the campaign is to expand outreach to women

of color through the Communities of Color Partnership effort implemented in 2005.

Over the past few years, the NHLBI has been working with the vascular community to identify educational needs related to PAD. In 2005, the Institute awarded a 3-year contract to plan, develop, and implement an NHLBI PAD awareness campaign for use by professional and public interest groups. The campaign is being designed to raise awareness of the signs and symptoms of PAD, encourage those at risk to seek diagnosis and treatment, and educate the public about PAD risk factors. The NHLBI has collaborated closely with the PAD Coalition in planning campaign strategies and will continue to involve the Coalition and other interested organizations in upcoming campaign activities.

COPD is a new area of education emphasis for the NHLBI. The Institute's 2004 strategy development workshop on COPD yielded recommendations for a national education initiative. In 2005, a 3-year contract was awarded for planning, developing, implementing, and evaluating a COPD awareness and education campaign.

Educational activities associated with von Willebrand disease were initiated in 2004. In response to a congressional recommendation, the NHLBI convened an expert panel to review the current science on the diagnosis and treatment of von Willebrand disease and to formulate clinical guidelines. Completion of the guidelines and their dissemination are scheduled for 2006.

The OPEC also is responsible for coordinating the Institute's nutrition program. The NHLBI Nutrition Coordinator serves as a major source of nutrition policy and nutrition science knowledge and advises the NHLBI Director on nutrition program policies and priorities. The Coordinator also is the Institute's representative to other relevant components of the NIH, the U.S. Department of Health and Human Services (DHHS), and other components of the Federal Government on nutrition research and policy. Major activities include contributing to the revision of the *Dietary Guidelines for Americans,* which was released jointly by the DHHS and the U.S. Department of Agriculture (USDA) in 2005; joining in the DHHS/USDA dialogue on revising the Food Guide Pyramid; and working with the U.S. Food and Drug Administration on changes to consumer education efforts related to food labels.

As a key part of its response to the Healthy People 2010 Objectives for the Nation, the NHLBI initiated a new funding mechanism in 2001 to establish CVD educational outreach programs in high-risk communities. The program—Enhanced Dissemination and Utilization Centers (EDUCs)—is a partnership between the NHLBI and local communities to eliminate cardiovascular health disparities and improve the health of underserved populations. Since its inception, two sets of six EDUCs have been awarded that served more than 31 communities in 10 States. The first set of EDUCs ended in 2004; the second set was completed in December 2005. The lessons learned from the EDUCs will provide valuable information to other communities interested in conducting CVD outreach and education activities.

Since the NHLBI planning workshop, "Education Strategy Development Workshop—Public Health in Public Housing: Improving Health, Changing Lives," conducted in 2004, the NHLBI has held exploratory discussions with potential partners to implement clinical and public health activities in public housing communities. The goal of the program is to improve prevention and control of CVD risk factors and enhance adoption of healthy lifestyle behaviors by public housing residents.

The Institute's "Salud para su Corazón" (Health for Your Heart) Initiative, a community-based heart health program for Latinos, has expanded across the United States to include communities along the Texas–Mexico border and along the southern border areas of California and New Mexico. Trained local lay health workers (*promotores de salud*), applying the values and culture of the community, teach individual and patients how to reduce their risk of developing CVD. As advocates for change, lay health workers have increased the number of Latinos in their communities who are engaging in heart healthy behaviors.

The NHLBI and the Indian Health Service have worked together since 2000 to bring heart health to American Indian and Alaska Native (AI/AN) communities. Initial steps were focused on identifying the unique needs and issues that affect tribal communities. The NHLBI developed a training manual, *Honoring the Gift of Heart Health*, for community instructors to enable them to provide a culturally sensitive course on heart health. In 2003, a national workshop to train the trainers was held for key tribal leaders and health practitioners in AI/AN communities nationwide. It produced instructors equipped to conduct future training sessions. In 2005, three regional skills-building training workshops were completed. The regional workshops continue to produce

local community skills-building workshops, to build local tribal capacity and to extend the reach to include other nearby tribes.

The NHLBI's Asian American and Pacific Islander Cardiovascular Health Outreach effort focuses on four underserved groups with high blood pressure, obesity, physical inactivity, and smoking. Individuals of Philippine, Vietnamese, Cambodian, and Native Hawaiian heritage comprise the current targeted audiences. To date, educational materials on cardiovascular health have been developed for the Filipino and Vietnamese communities. A school-based intergenerational cardiovascular health curriculum to educate Native Hawaiian elementary school children is being developed.

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

International Activities

The Institute is a world leader in research and policy development in heart, lung, and blood diseases, sleep disorders, and blood resources. Through its international programs, the NHLBI contributes to, and benefits from, the rapidly developing global knowledge base in medicine, science, and technology related to its mission.

The Institute's international activities are conducted through multiple mechanisms, including government-to-government and institute-to-institute agreements; joint research projects; joint symposia and workshops; and joint documents, publications, grants, contracts, and fellowships. In addition, the Institute is providing training in its laboratories to international research fellows from approximately 30 countries. Canada, India, Italy, Japan, Korea, Poland, Russia, and Vietnam are among the countries that have maintained collaborative working relationships with the NHLBI. The partnerships extend the benefits of the Institute's prevention and treatment programs to other countries.

The Director and senior NHLBI staff serve as consultants to, and partners with, the Pan American Health Organization (PAHO) and the World Health Organization (WHO). Last year, in recognition of its leadership and contributions to global and international health, the NHLBI was redesignated as a WHO Collaborating Center for Research and Training in Cardiovascular Diseases in the Americas. Through its activities as a PAHO/WHO collaborating center, the Institute is addressing the pandemic of CVD in North, Central, and South America and the Caribbean. In 2004, it sponsored a workshop, "Charting New Directions for Cardiovascular Disease Prevention and Control in the Americas," that was followed up by a symposium, "Lay Health Workers/Promotores de Salud: Mobilizing Communities, to Improve Heart Health in the Americas," in 2005.

Plans for continued regional collaboration include implementing performance-based demonstration projects that will conduct and evaluate promising community-based interventions to prevent heart disease in low-resource countries in the Americas. The projects include collaboration with PAHO's CARMEN Network and NHLBI programs such as "Salud para su Corazón" and EDUCs to establish a repository of tools and methodologies that can be disseminated broadly among interested partners in the region.

The NHLBI and the Institute of Circulatory and Respiratory Health, Canadian Institutes of Health Research (CIHR), continue their collaborative effort in cardiovascular, pulmonary, and blood diseases research that began in 2003. Joint programs were implemented in the following areas:

- Clinical Research Consortium To Improve Resuscitation Outcomes
- Cellular and Molecular Imaging of the Cardiovascular, Pulmonary, and Hematopoietic Systems
- Inflammation and Thrombosis.

The NHLBI supports efforts to encourage collaboration and new research endeavors for rare diseases. In the area of blood diseases, the Institute supports a collaborative effort with Ghana to compare the differences in epidemiology and etiology of infections in SCD between Africa and the United States. In July 2005, the Sickle Cell Center at the Children's Hospital of Philadelphia and the Sickle Cell Foundation of Ghana held the 5th International African Symposium on Sickle Cell Disease, in Accra, Ghana. The Institute also supports clinical studies on Cooley's anemia in the United Kingdom and has initiated research into the genetics and basic

mechanisms of Diamond-Blackfan anemia and other rare inherited bone marrow failure syndromes with Australia, Canada, and Sweden.

A working group of national and international experts in Transfusion Medicine developed the NHLBI Strategic Plan on Global Blood Safety in 2004. The working group identified research areas to strengthen national blood programs and transfusion services in developing countries using current grant mechanisms. It provided recommendations to the NHLBI on effective interventions to prevent transmission of HIV/AIDS and other blood-borne infections through blood products.

The Retrovirus Epidemiology Donor Study (REDS) added an international component to conduct epidemiologic, laboratory, and survey research on blood donors in selected developing countries in regions seriously affected by the HIV/AIDS epidemic such as Africa, Asia, and South America to increase the safety and availability of blood for transfusion.

Understanding malarial anemia is a primary concern in many parts of the world, especially in sub-Sahara Africa, where severe anemia is one of the deadliest complications in children infected with malaria. The Institute is supporting research in Kenya to identify the pathogenesis of severe malarial anemia in children.

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

3. Important Events

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

November 22–24, 1964. The Second National Conference on Cardiovascular Diseases, cosponsored by the American Heart Association, the NHI, and the Heart Disease Control Program of the PHS, is held to evaluate progress since the 1950 Conference and to assess needs and goals for continued and accelerated growth against heart and blood vessel diseases.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

June 12, 1972. Elliot Richardson, Secretary, HEW, approves a nationwide program for high blood pressure information and education and appoints two committees to implement the program: the Hypertension Information and Education Advisory Committee, chaired by the Director, NIH, and the Interagency Working Group, chaired by the Director, NHLI. A High Blood Pressure Information Center is established within the NHLI Office of Information to collect and disseminate public and professional information about the disease.

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

July 14, 1972. Secretary Richardson approves reorganization of the NHLI, with the Institute elevated to Bureau status within the NIH and comprising seven division-level components: Office of the Director, DHVD, DLD, DBDR, DIR, Division of Technological Applications, and 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 Public Health Service Act (P.L. 94–278) changes the name of the NHLI to the National Heart, Lung, and Blood Institute (NHLBI) and provides for an expansion in blood-related activities within the Institute and throughout the National Heart, Blood Vessel, Lung, and Blood Program.

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

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

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

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

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

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

September 8, 1981. The Working Group on Arteriosclerosis, convened in 1978 to assess present understanding, highlight unresolved problems, and emphasize opportunities for future research in arteriosclerosis, completes its report. Volume I presents conclusions and recommendations in nontechnical language. Volume II provides an in-depth substantive basis for the conclusions and recommendations contained in Volume I.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

September 1987. The NHLBI commemorates the centennial of the NIH and the 40th anniversary of the Institute's inception. Two publications prepared for the Institute's anniversary, *Forty Years of Achievement in Heart, Lung, and Blood Research* and *A Salute to the Past: A History of the National Heart, Lung, and Blood Institute,* document significant Institute contributions to research and summarize recollections about the Institute's 40-year history.

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

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

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

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

September 1988. The Strong Heart Study is initiated. It focuses on CVD morbidity and mortality rates

and distribution of CVD risk factors in three geographically diverse American Indian groups.

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

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

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

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

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

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

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

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

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

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

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 NCDSR within the NHLBI.

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

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

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

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

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

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

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

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

November 13, 1996. The NHLBI releases findings from two studies, Dietary Approaches to Stop Hypertension (DASH) Trial and Trial of Nonpharmacologic Intervention in the Elderly (TONE). The DASH Trial demonstrates that a diet low in fat and high in vegetables, fruits, fiber, and low-fat dairy products significantly and quickly lowers blood pressure. The TONE shows that weight loss and reduction of dietary sodium safely reduce the need for antihypertensive medication in older patients while keeping their blood pressure under control.

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

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

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

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

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

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

documents the remarkable research advances of the past 50 years.

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

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

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

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

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

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

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

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

March 1999. The Acute Respiratory Distress Syndrome (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 CDC, the National Institute of Neurological Disorders and Stroke, 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 new Adult Treatment Panel III (ATP III) guidelines for the detection, evaluation, and treatment of high blood cholesterol in adults.

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 Health League (WHL) and the NHLBI hold an international symposium; subsequently they prepare an action plan at the WHL Council Conference to control hypertension and obesity.

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

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

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

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

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

December 4, 2002. Results of the Atrial Fibrillation Follow-up Investigation of Rhythm Management Trial (AFFIRM) indicate that rate control rather than rhythm control may be the preferred approach for patients with atrial fibrillation. The rate control strategy involves the

use of less expensive drugs and results in fewer hospitalizations.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

October 2004. Results from a new study of adults with mild asthma by researchers participating in the ACRN demonstrated 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 stoke 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.

April 20, 2005. Results of the Azithromycin and Coronary Events Study show that a 1-year course of weekly azithromycin, an antibiotic, does not alter the risk of cardiac events among patients with stable coronary artery disease.

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 2003, cardiovascular, lung, and blood diseases accounted for 1,150,000 deaths and 47 percent of all deaths in the United States (p. 39). The projected economic cost in 2006 for these diseases is expected to be $560 billion, 22 percent of the total economic costs of illness, injuries, and death (p. 55). Of all diseases, heart disease is the leading cause of death, cerebrovascular disease is third (behind cancer), and COPD (including asthma) ranks fourth (p. 42). Cardiovascular and lung diseases account for 3 of the 4 leading causes of death (p. 42) and 5 of the 10 leading causes of infant death (p. 48). Hypertension, heart disease, asthma, and chronic bronchitis are especially prevalent and account for substantial morbidity in Americans (p. 51). Increases in prevalence have been greatest for asthma and heart failure.

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

Cardiovascular Diseases

- In 2003, CVD caused 911,000 deaths—37 percent of all deaths (p. 39).
- Heart disease is the leading cause of death; the main form, CHD, caused 479,000 deaths in 2003 (pp. 40, 42).
- The annual number of deaths from CVD increased substantially between 1900 and 1970 and remains high (p. 41).
- The death rate (not age-adjusted) for CVD increased from 1920 until it peaked in 1968. Since then, the trend has been downward. In 2003, the rate was similar to the rate in 1930 (p. 41).
- Cerebrovascular disease, the third leading cause of death, accounted for 158,000 deaths in 2003 (pp. 40, 42).
- Heart disease is second only to all cancers combined in years of potential life lost (p. 42).
- Among minority groups, heart disease ranks first, and stroke ranks fifth or higher as the leading causes of death (p. 42).
- The rapid increase in deaths due to heart failure between 1970 and 2003 is a major exception to the mortality decline in CVD (p. 43).
- Between 1985 and 2002, death rates for heart disease and stroke declined in men and women of all racial/ethnic groups. Declines in death rates for heart disease were greatest in whites and for stroke, were greatest in blacks (p. 44).
- Because of the rapid decline in mortality from CHD since the peak in 1968, there were 941,000 fewer deaths from CHD in 2003 than would have occurred if there had been no decline (p. 45).
- 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. 45).
- The decline in CHD mortality began earlier in the United States than in most countries and

outpaced that in most countries (only selected countries are shown) (p. 46).
- Between 1993 and 2003, the percent decline in death rates for CHD was greatest among white males and least among black females (p. 47).
- In 2003, an estimated 71.3 million persons in the United States had some form of CVD, 65 million had hypertension, and 13 million had CHD (p. 51).
- 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 ceased in 1990; since then the prevalence has increased (p. 52).
- Between 1976–80 and 1999–2002, 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. 53).
- A 1999–2002 national survey showed only about one-third 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. 53).
- Hospitalization rates for heart failure increased between 1971 and 2003 (p. 54).
- The estimated economic cost of CVD for 2006 is approximately $403 billion:
  - $258 billion in direct health expenditures
  - $36 billion in indirect cost of morbidity
  - $110 billion in indirect cost of mortality (p. 55).

Lung Diseases

- Lung diseases, excluding lung cancer, caused an estimated 243,000 deaths in 2003 (p. 39).
- COPD caused 122,000 deaths in 2003 and is the fourth leading cause of death (pp. 40, 42).
- Between 1993 and 2003, death rates for COPD increased substantially in women and decreased in men; mortality for asthma decreased appreciably (p. 47).
- Between 1980 and 2003, infant death rates for various lung diseases declined markedly (p. 45).
- Of the eight leading causes of infant mortality, four are lung diseases or have a lung disease component (p. 48). Between 1993 and 2003, changes in mortality for the causes were:
  - Congenital anomalies (-14 percent)
  - Disorders of short gestation (-<1 percent)
  - Sudden infant death syndrome (-60 percent)
  - Respiratory distress syndrome (-57 percent).
- Lung diseases accounted for 18 percent of all deaths of children under 1 year of age in 2003 (p. 48).
- The COPD death rate for women in the United States is increasing significantly compared with the rates in several other countries (p. 49).
- Between 1985 and 2002, death rates for COPD increased for women in all racial/ethnic groups except Asian. For men, they increased in American Indians, decreased in whites and Asians, and were essentially flat in blacks and Hispanics (p. 50).
- Sleep disorders are increasingly being recognized as an important health problem. The number of physician office visits for sleep apnea, restless legs syndrome, and narcolepsy increased from 1,046,927 in 1990 to 5,798,762 in 2003 (p. 50).
- Asthma is a common chronic condition, particularly in children (pp. 51, 52, 54).
- The economic cost of lung diseases is expected to be $144 billion in 2006—$87 billion in direct health expenditures and $57 billion in indirect cost of morbidity and mortality (p. 55).

Blood Diseases

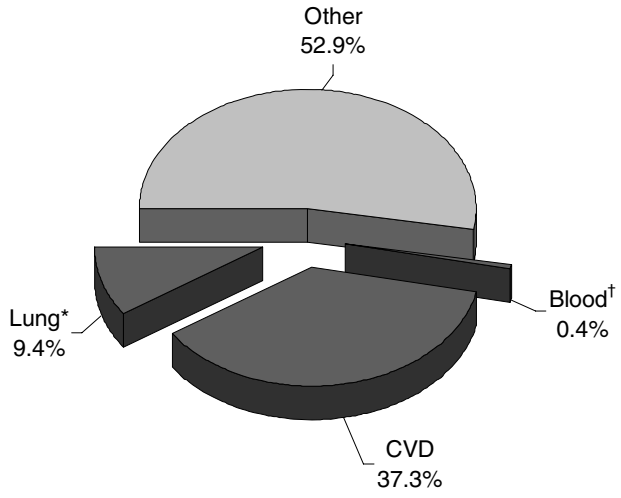
- An estimated 242,000 deaths, 10 percent of all deaths, were attributed to blood diseases in 2003 (p. 39). These include the following:
  - 232,000 due to blood-clotting disorders
  - 10,000 to diseases of the red blood cell and bleeding disorders (p. 40).
- A large proportion of deaths from AMI and cerebrovascular disease involve blood-clotting problems (p. 40).
- In 2006, blood-clotting disorders are expected to cost the Nation's economy $94 billion, and other blood diseases will cost $13 billion (p. 55).
- The mean age at death for persons with sickle cell anemia increased from about 28 years in 1979 to 37.3 years in 2002 (not shown).

Deaths From All Causes and Deaths From Cardiovascular, Lung, and Blood Diseases, U.S., 1983 and 2003

Cause of Death	1983 Number of Deaths	1983 Percent of Total	2003 Number of Deaths	2003 Percent of Total
All Causes	2,019,000	100	2,444,000	100
All Cardiovascular, Lung, and Blood Diseases	1,149,000	57	1,150,000	47
Cardiovascular Diseases	992,000	49	911,000	37
Blood	321,000*	16	242,000**	10
Lung	162,000†	8	243,000‡	10
All Other Causes	870,000	43	1,294,000	53

* Includes 314,000 CVD deaths involving blood-clotting diseases.
** Includes 232,000 CVD deaths involving blood-clotting diseases.
† Includes 12,000 CVD deaths due to pulmonary heart disease.
‡ Includes 14,000 CVD deaths due to pulmonary heart disease.
Source: Vital Statistics of the United States, National Center for Health Statistics (NCHS).

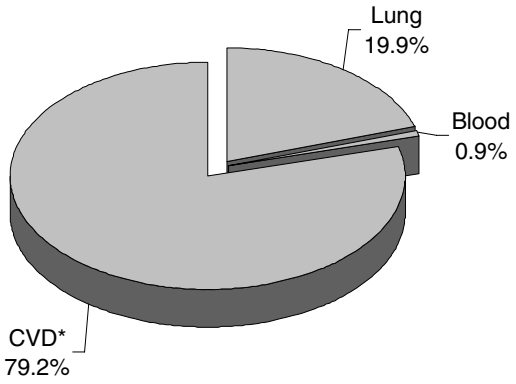
Deaths by Major Causes, U.S., 2003



Total Cardiovascular, Lung, and Blood Diseases 47.1%

* Excludes deaths from pulmonary heart disease (14,000).
† Excludes deaths from blood-clotting disorders and pulmonary embolism (232,000).

Deaths From Cardiovascular, Lung, and Blood Diseases, U.S., 2003



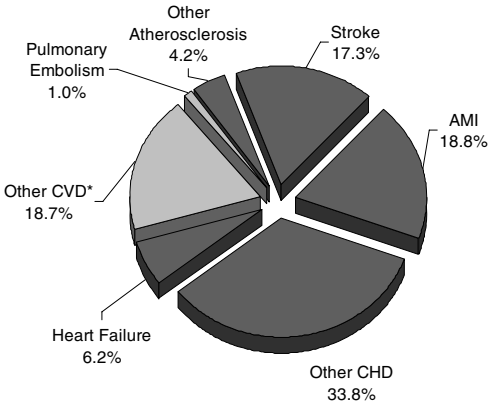
* CVD involving blood clotting (20.2%).

Deaths From Specific Cardiovascular, Lung, and Blood Diseases, U.S., 2003

Cause of Death	Deaths (Thousands)		
	Cardiovascular	Lung	Blood
Acute Myocardial Infarction	171	—	116*
Other Coronary Heart Disease	308	—	—
Heart Failure	57	—	—
Cerebrovascular Diseases (Stroke)	158	—	103*
Other Atherosclerosis	38	—	4*
Pulmonary Embolism	9	9*	9*
Other Cardiovascular Diseases	170	5*	—
Bleeding and Red Blood Cell Diseases	—	—	10
Chronic Obstructive Pulmonary Disease	—	122	—
Asthma	—	4	—
Other Airway Diseases	—	1	—
Pneumonia	—	63	—
Neonatal Pulmonary Disorders	—	5	—
Interstitial Lung Diseases	—	6	—
Lung Diseases Due to External Agents	—	19	—
Other Lung Diseases	—	9	—
Total	**911**	**243**	**242**

* Deaths from clotting or pulmonary disorders also are included as cardiovascular deaths.
Note: Total, excluding overlap, is 1,150,000.
Source: Estimated by the NHLBI from Vital Statistics of the United States, NCHS.

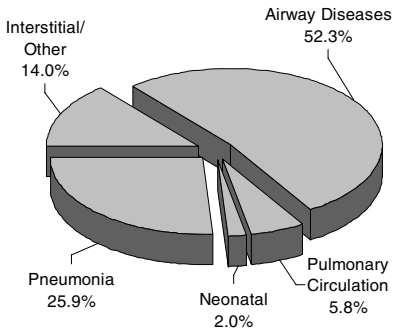
Deaths From Cardiovascular Diseases, U.S., 2003



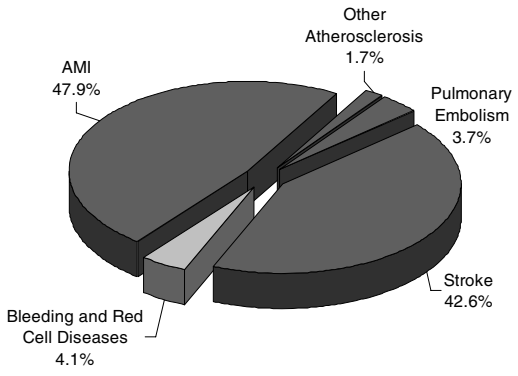
Atherosclerosis-Related Disease 81.3%

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

Deaths From Lung Diseases, U.S., 2003



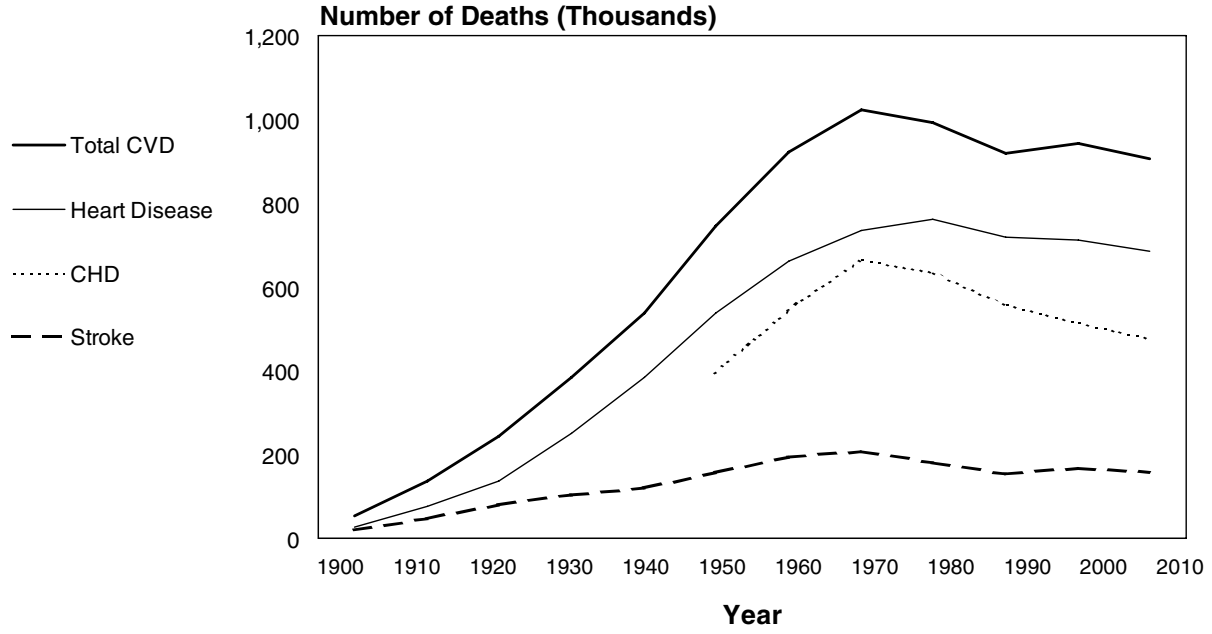
Deaths From Blood Diseases, U.S., 2003



Blood-Clotting Disorders 95.9%

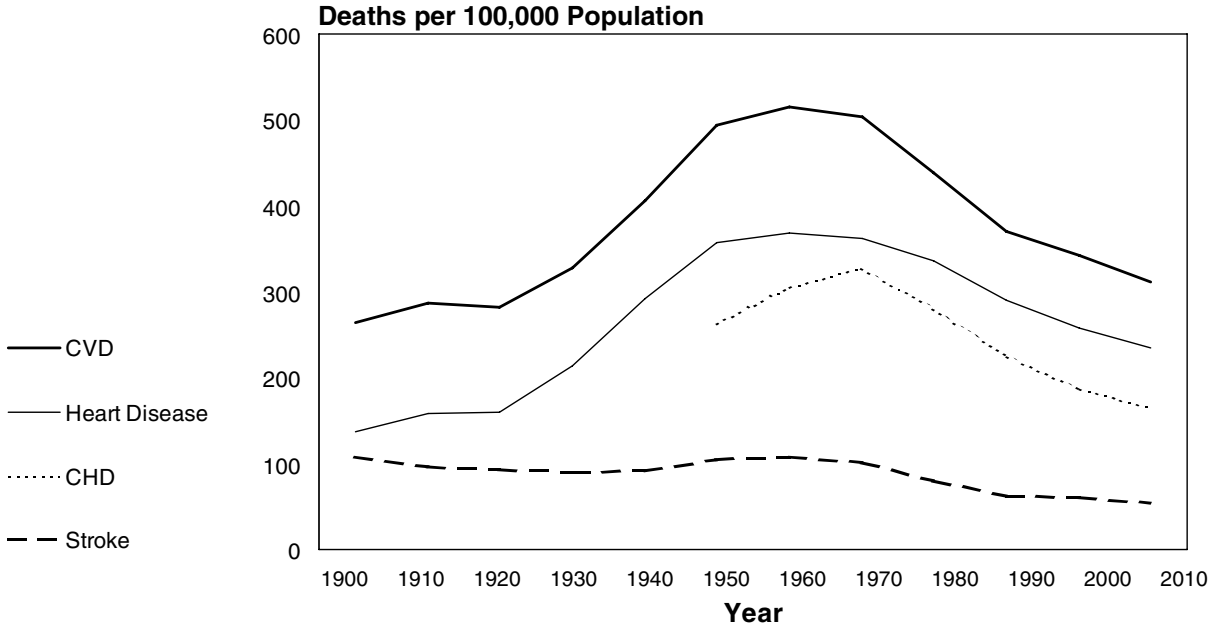
Source: Estimated by the NHLBI from Vital Statistics of the United States, NCHS.

Deaths From Cardiovascular Diseases, U.S., 1900–2003



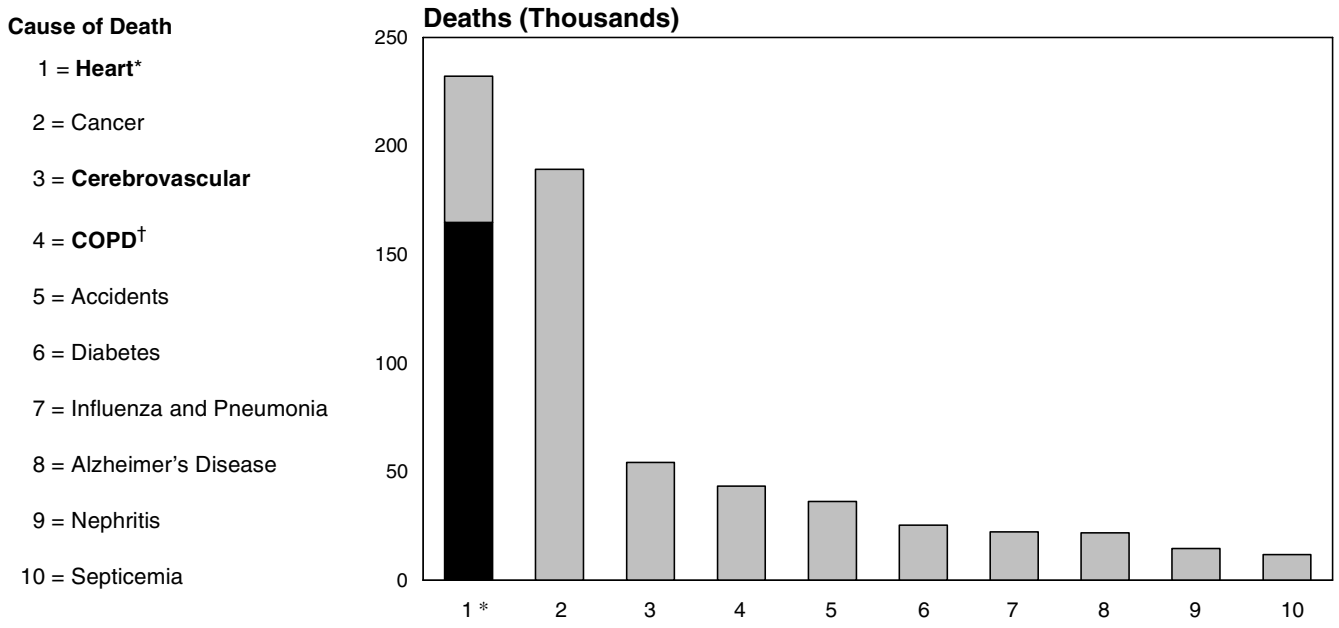
Source: Vital Statistics of the United States, NCHS.

Death Rates* for Cardiovascular Diseases, U.S., 1900–2003



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

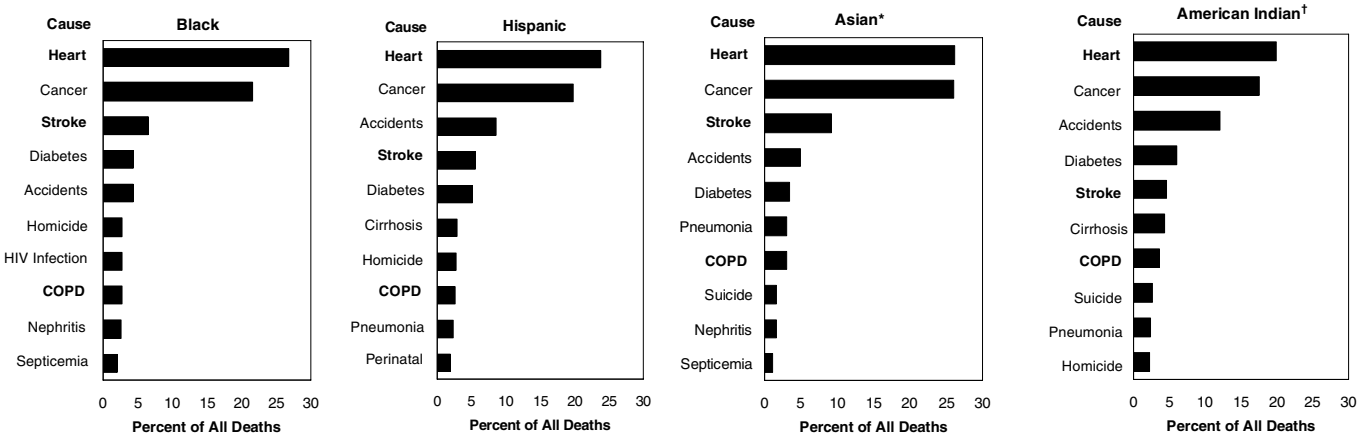
Ten Leading Causes of Death: Death Rates, U.S., 2003



	1 *	2	3	4	5	6	7	8	9	10
Years of potential life lost (millions)‡	3.6	4.9	0.6	0.6	3.0	0.6	0.3	< 0.1	0.2	0.2

* Includes 164.8 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: Bolded diseases are those addressed in Institute programs.
Source: Vital Statistics of the United States, NCHS.

Ten Leading Causes of Death Among Minority Groups, U.S., 2002



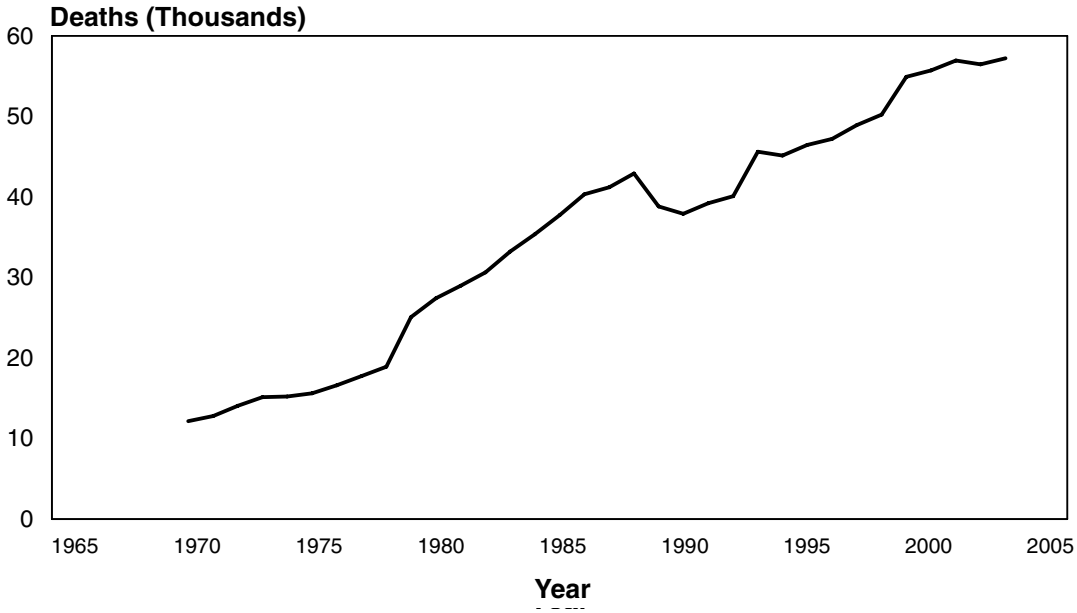
* Includes deaths among individuals of Asian extraction and Asian-Pacific Islanders.
† Includes deaths among Aleuts and Eskimos.
Note: Bolded causes of death are those addressed in Institute programs.
Source: Vital Statistics of the United States, NCHS.

Death Rates* for Cardiovascular and Noncardiovascular Diseases, U.S., 1963, 1983, and 2003

Cause of Death	Rate* 1963	1983	2003	Percent Change 1963–2003	Percent Change 1983–2003
All Causes	1,346	990	831	-38	-16
Cardiovascular Diseases	805	504	307	-62	-39
Coronary Heart Disease	476	316	163	-66	-48
Stroke	174	86†	54	-69	-37
Other	153	102	90	-41	-12
Noncardiovascular Diseases	541	486	524	-3	+8
COPD and Asthma	16	33‡	42	+164	+28
Other	525	453	482	-8	+6

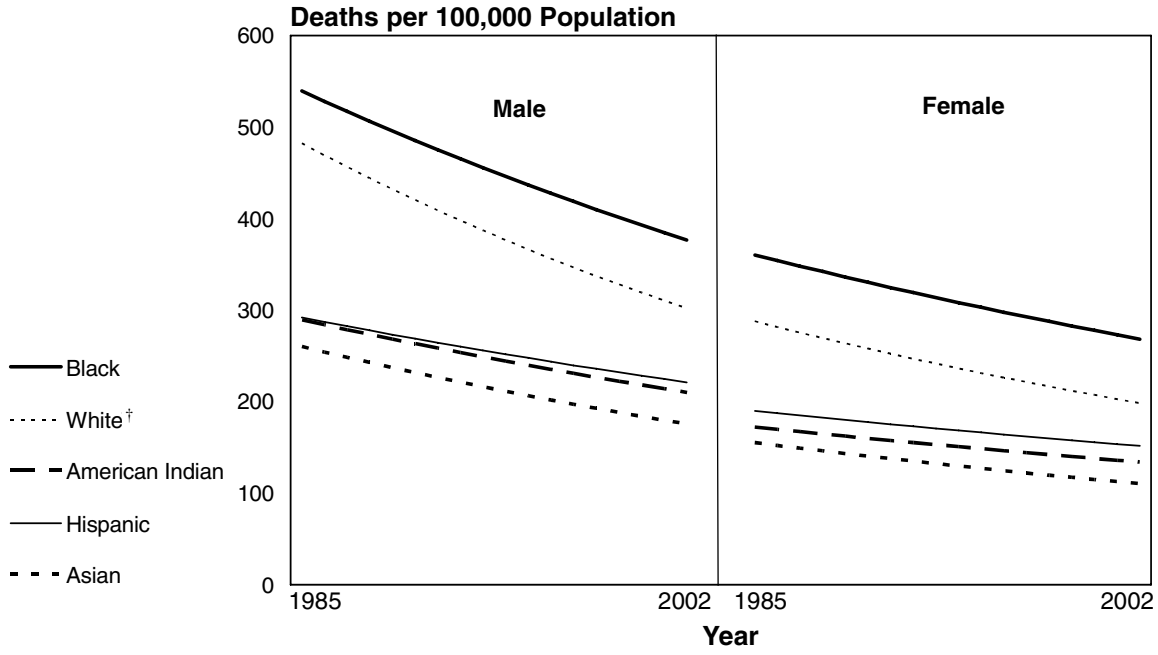
* Age-adjusted; rate per 100,000 population.
† Comparability ratio (1.0588) applied.
‡ Comparability ratio (1.0478) applied.
Source: Vital Statistics of the United States, NCHS.

Deaths From Heart Failure, U.S., 1970–2003



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

Death Rates* for Heart Disease by Gender, Race, and Ethnicity, U.S., 1985–2002

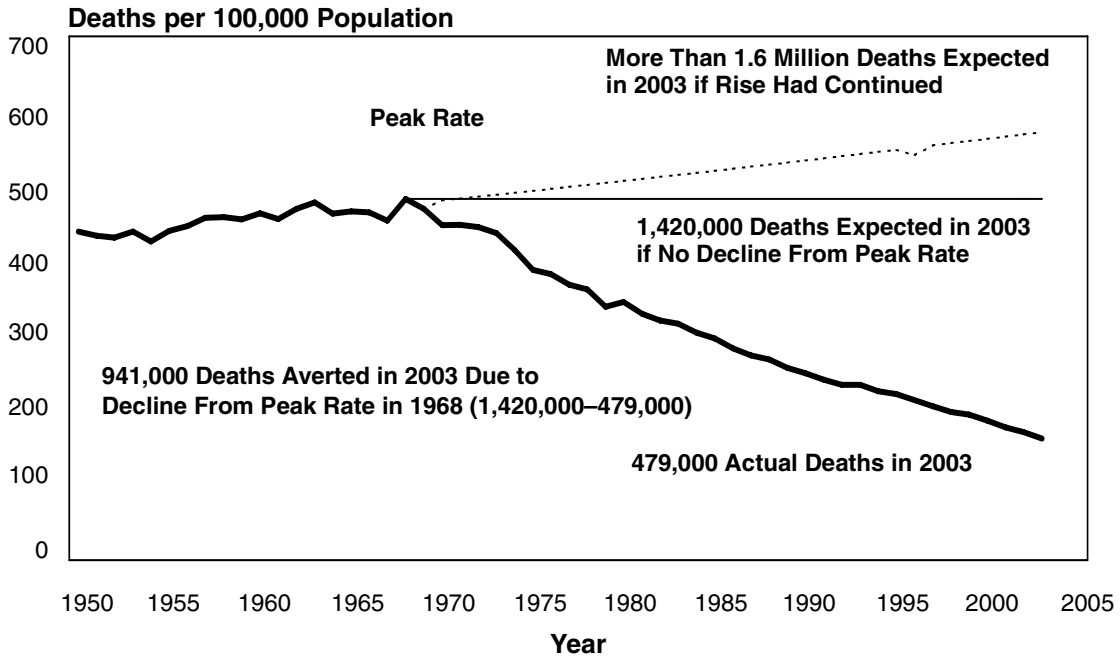


* Age-adjusted.
† Non-Hispanic.
Note: Each line is a log linear regression derived from the actual rates.
Source: Vital Statistics of the United States, NCHS.

Death Rates* for Stroke by Gender, Race, and Ethnicity, U.S., 1985–2002

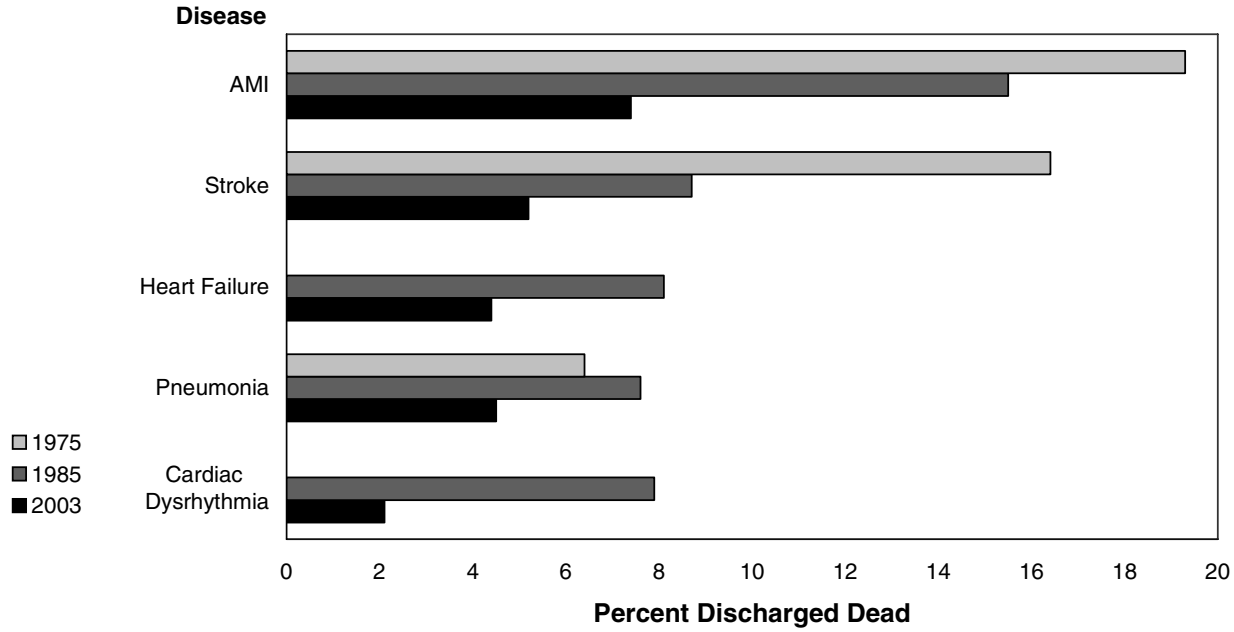
* Age-adjusted.
† Non-Hispanic.
Note: Each line is a log linear regression derived from the actual rates.
Source: Vital Statistics of the United States, NCHS.

Death Rates* for Coronary Heart Disease, U.S., 1950–2003
Actual Rate and Expected Rates if Rise Had Continued or Reached a Plateau



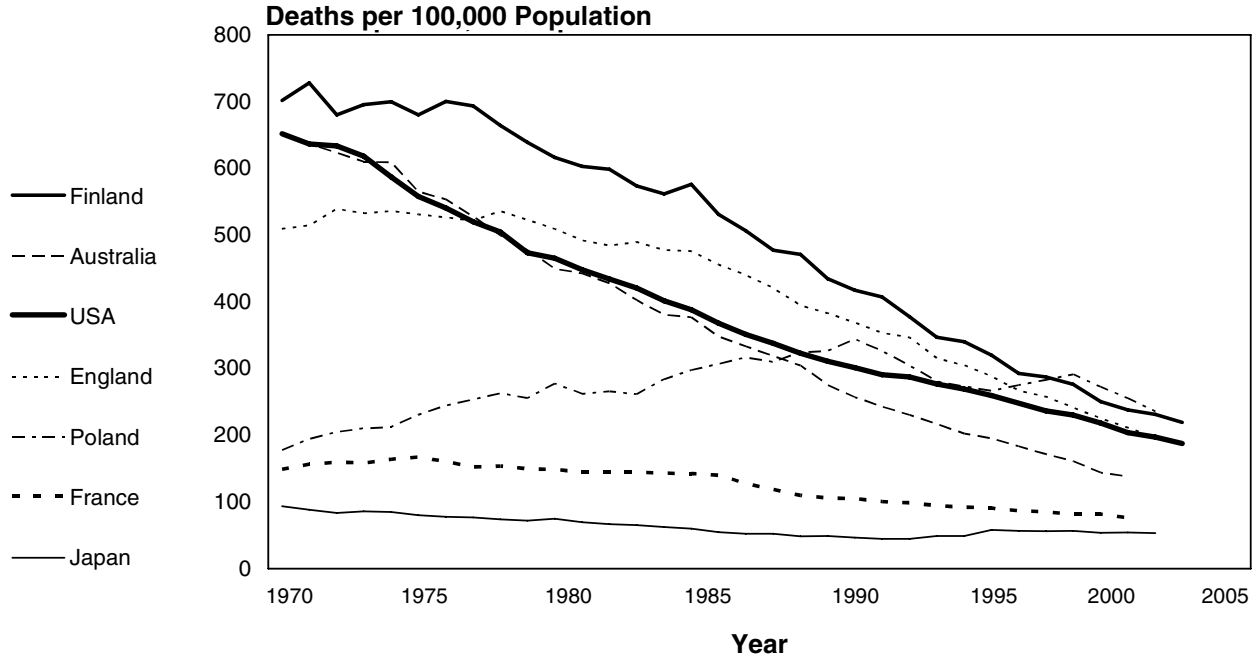
* Age-adjusted.
Source: Vital Statistics of the United States, NCHS.

Common Cardiovascular and Lung Diseases With High Percentage Discharged Dead From Hospitals, U.S., 1975, 1985, and 2003



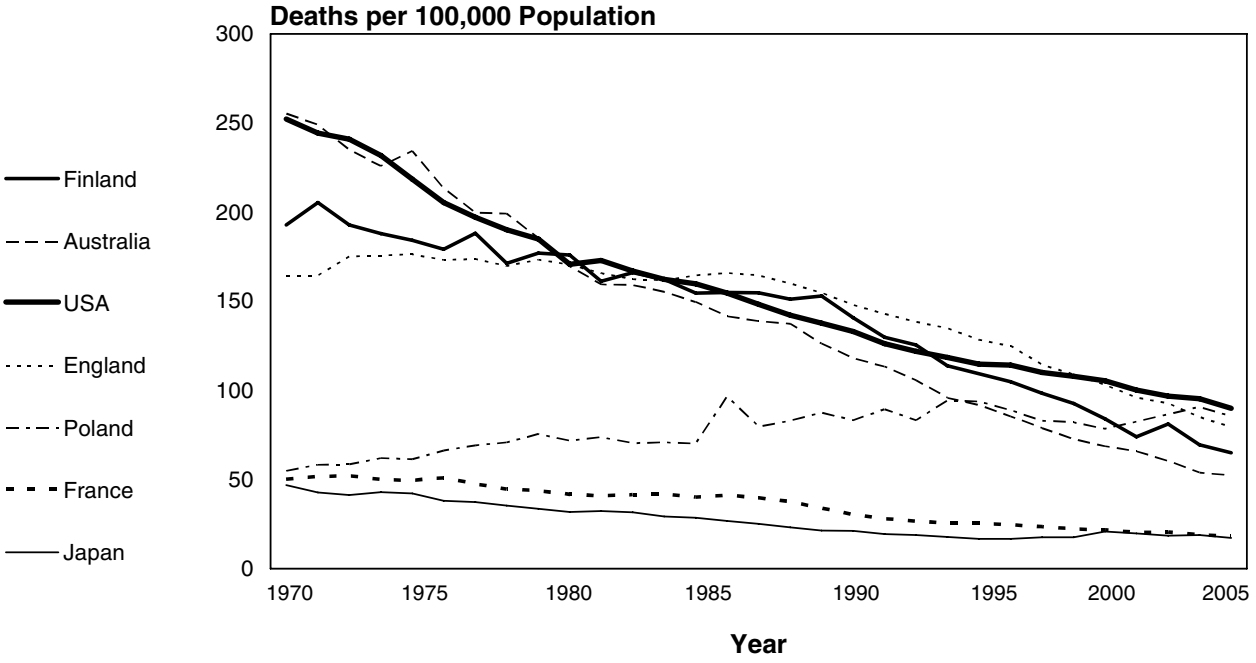
Source: National Hospital Discharge Survey, NCHS.

Death Rates* for Coronary Heart Disease in Men Ages 35–74 Years, Selected Countries, 1970–2003



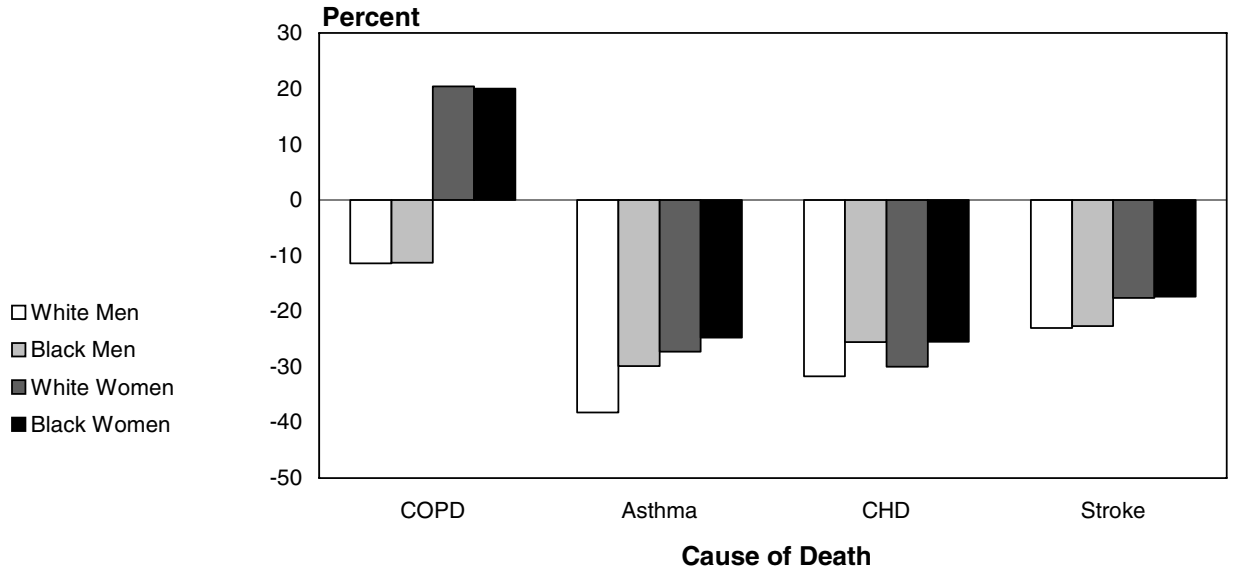
* Age-adjusted to the European Standard Population.
Source: World Health Organization.

Death Rates* for Coronary Heart Disease in Women Ages 35–74 Years, Selected Countries, 1970–2003



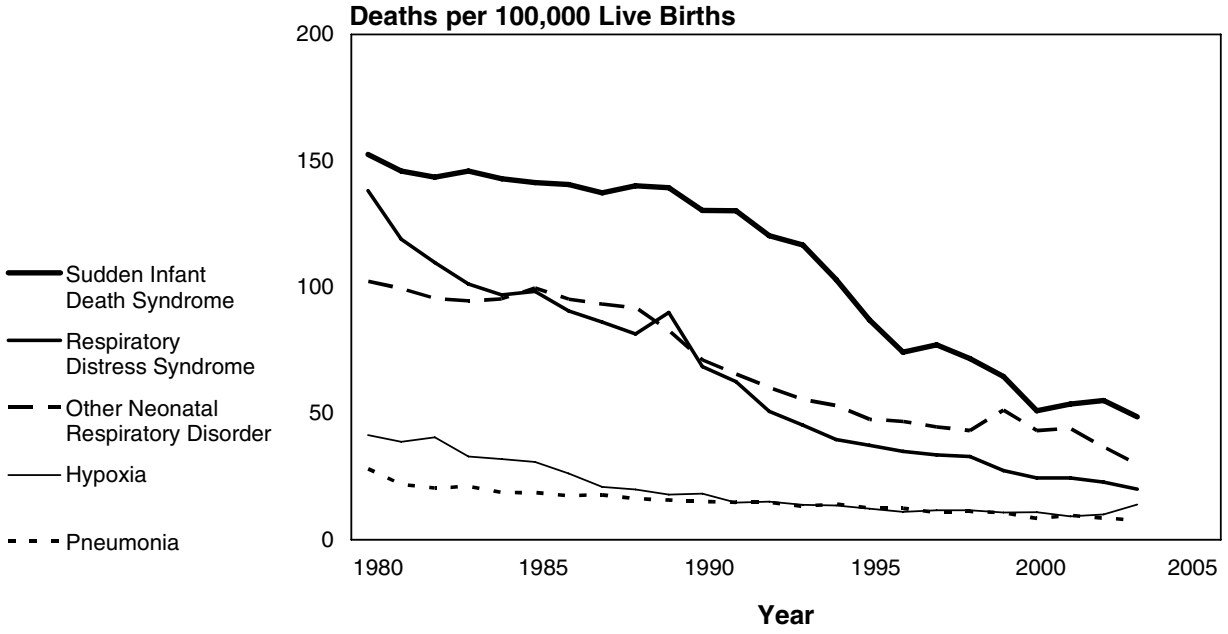
* Age-adjusted to the European Standard Population.
Source: World Health Organization.

Change in Death Rates* for Selected Causes by Race and Gender, U.S., 1993–2003



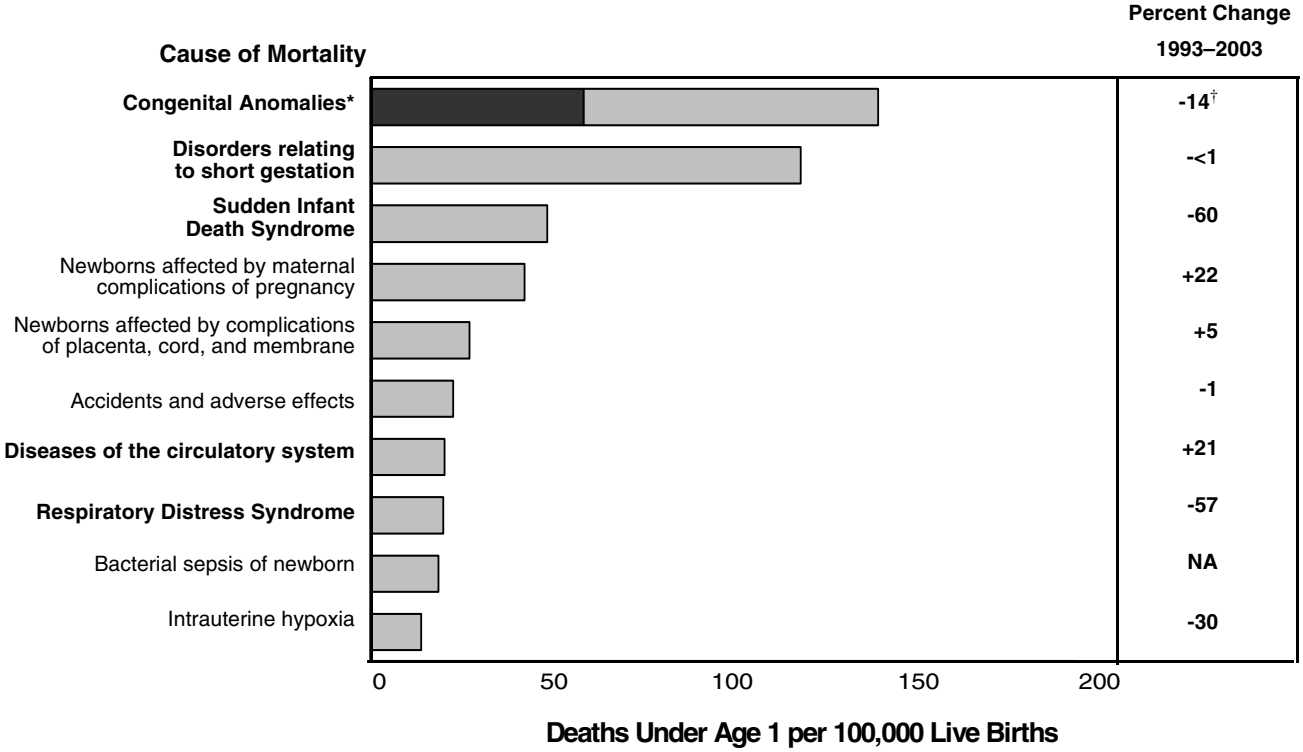
* Age-adjusted.
Source: Vital Statistics of the United States, NCHS.

Death Rates for Lung Diseases in Infants, U.S., 1980–2003



Source: Vital Statistics of the United States, NCHS.

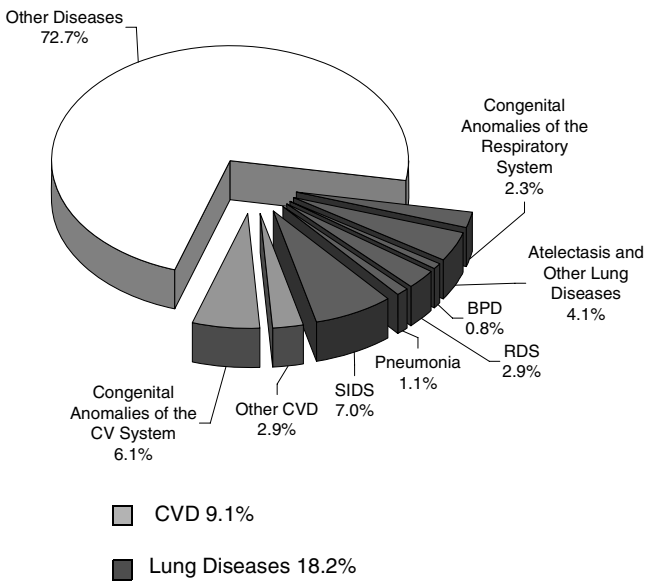
Ten Leading Causes of Infant Mortality, U.S., 2003



* Congenital CVD and congenital anomalies of the respiratory system (black bar) represented 42 percent of all infant deaths due to congenital anomalies.
† Between 1993 and 2003, congenital CVD declined 28 percent; congenital anomalies of the respiratory system increased 1 percent; other congenital anomalies declined 6 percent.
NA: Not available.
Note: Bolded diseases are those addressed in Institute programs.
Source: Vital Statistics of the United States, NCHS.

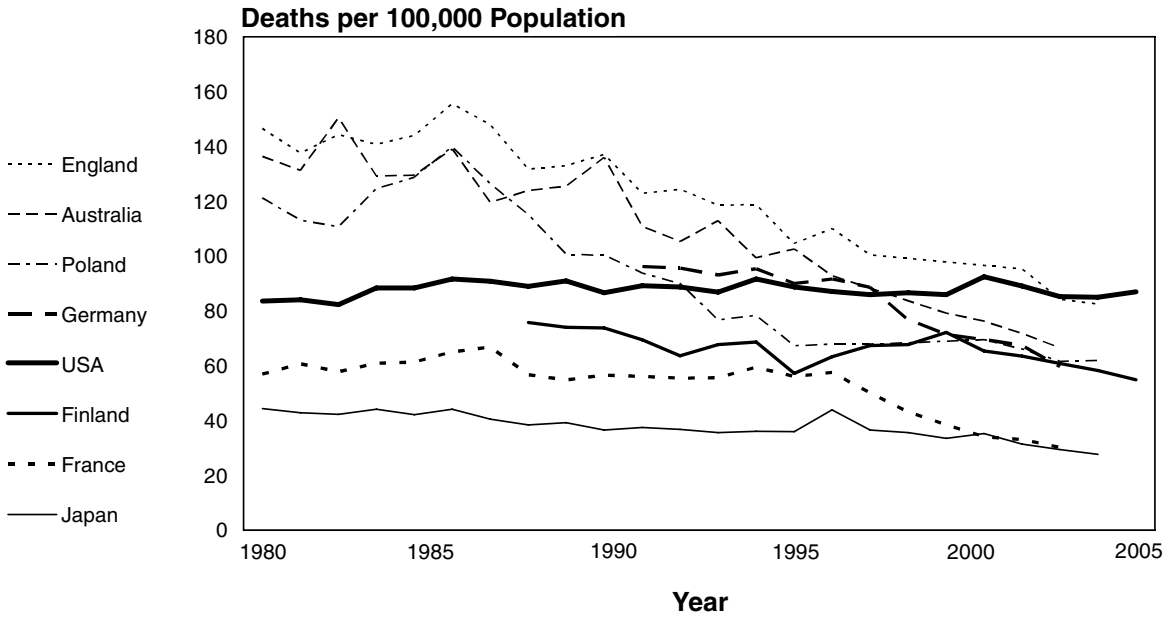
Deaths Under Age 1 Year Due to Cardiovascular and Lung Diseases, U.S., 2003

Cause of Death	Deaths Under Age 1
All Causes	28,422
Cardiovascular Diseases	**2,580**
Congenital Anomalies	1,746
Other	834
Lung Diseases	5,169
Sudden Infant Death Syndrome	**1,994**
Respiratory Distress Syndrome	**819**
Pneumonia	314
Bronchopulmonary Dysplasia (BPD)	238
Atelectasis of Newborn	450
Congenital Anomalies	**641**
Other Lung Diseases	713
Other Diseases	20,673



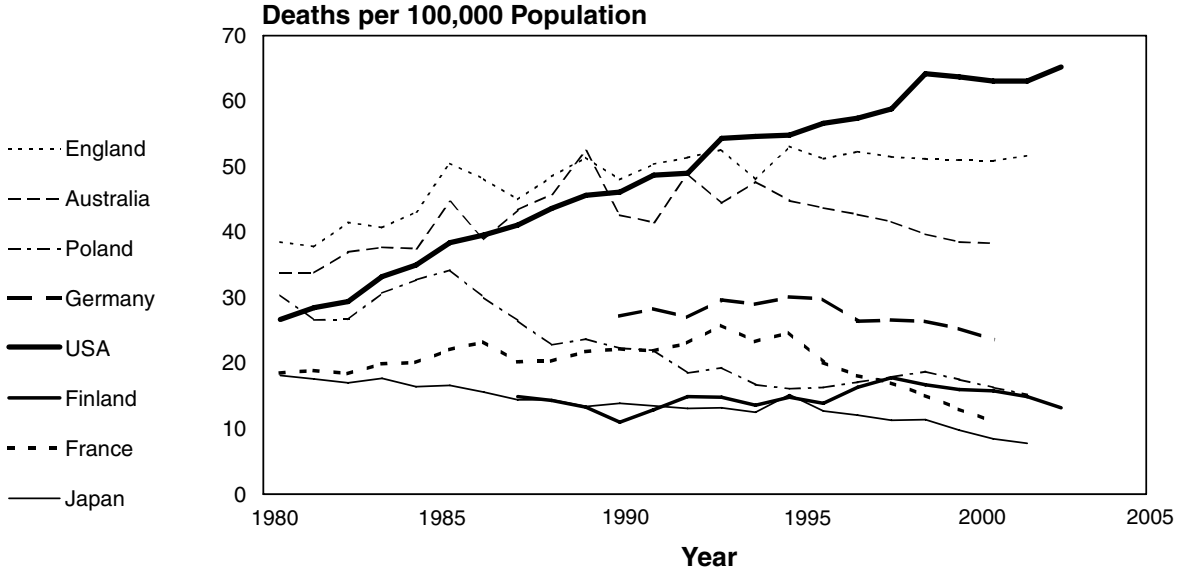
Note: Bolded diseases are those addressed in Institute programs.
Source: Vital Statistics of the United States, NCHS.

Death Rates* for Chronic Obstructive Pulmonary Disease in Men Ages 35+ Years, Selected Countries, 1980–2003



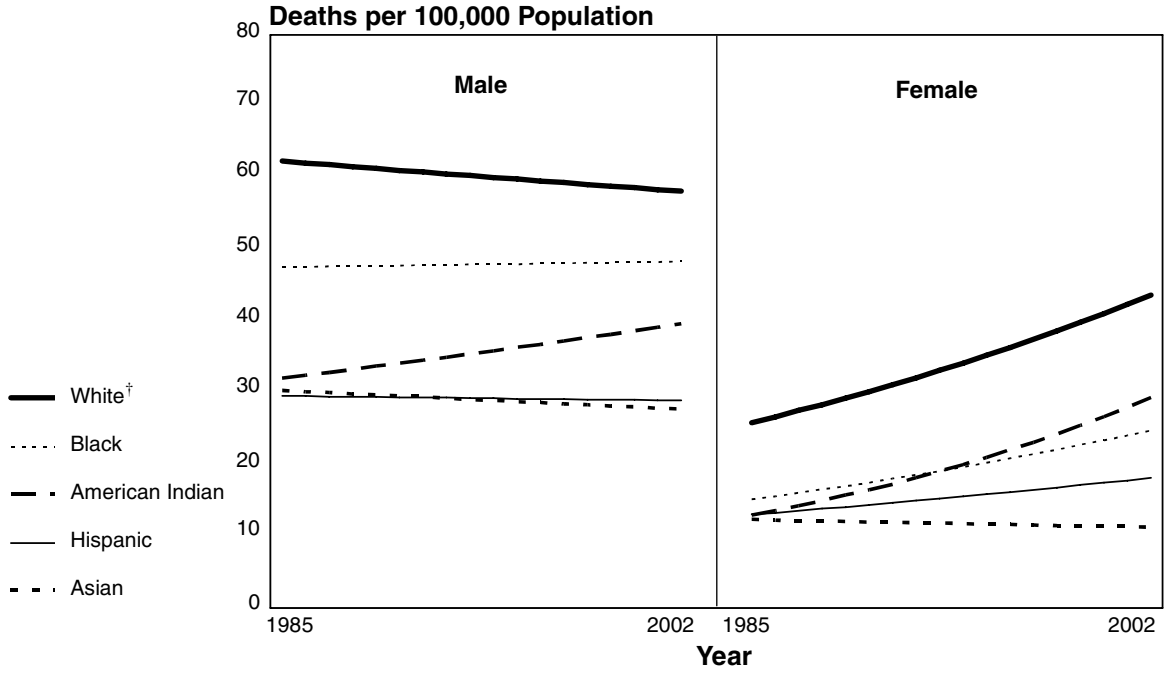
* Age-adjusted to the European Standard Population.
Source: World Health Statistics Annual, WHO.

Death Rates* for Chronic Obstructive Pulmonary Disease in Women Ages 35+ Years, Selected Countries, 1980–2003



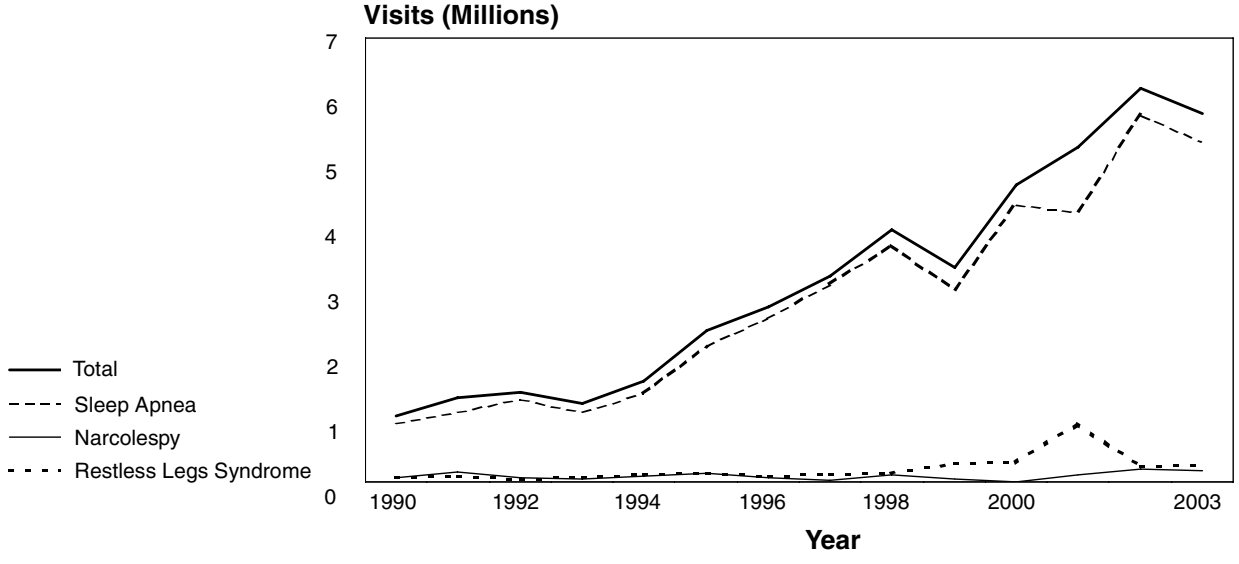
* Age-adjusted to the European Standard Population.
Source: World Health Statistics Annual, WHO.

Death Rates* for Chronic Obstructive Pulmonary Disease by Gender, Race, and Ethnicity, U.S., 1985–2002



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

Physician Office Visits for Sleep Disorders, U.S., 1990–2003



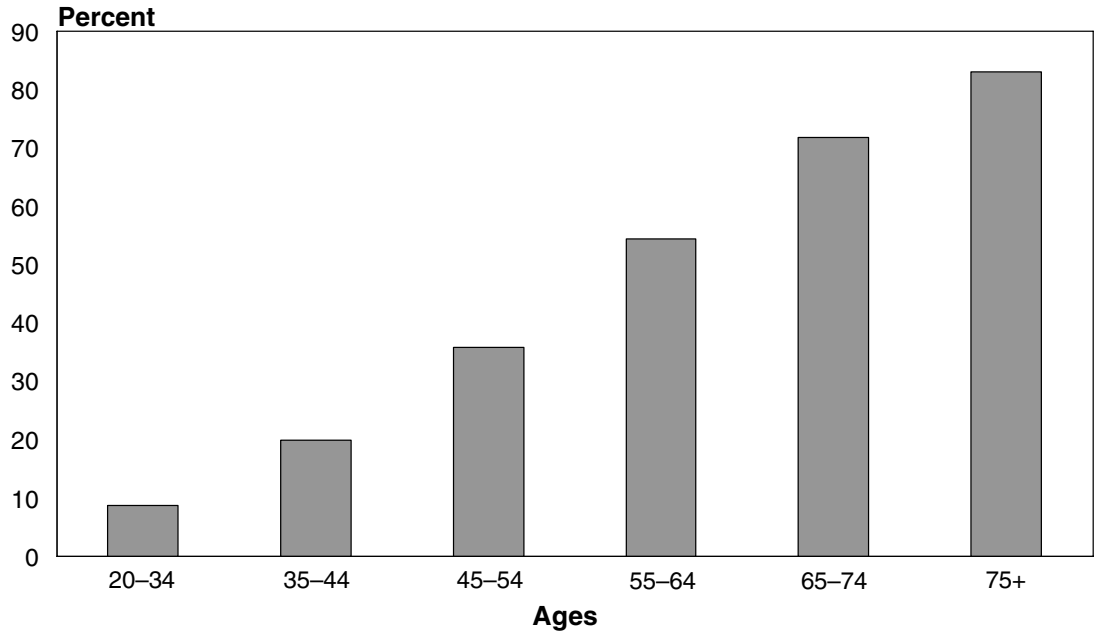
Source: National Ambulatory Medical Care Survey, NCHS.

Prevalence of Common Cardiovascular, Lung, and Blood Diseases, U.S., 2003

Disease	Number
Total Cardiovascular Diseases	71,300,000
Hypertension*	65,000,000
Coronary Heart Disease	13,200,000
Heart Failure	5,000,000
Stroke	5,500,000
Congenital Heart Disease	1,000,000
Asthma	20,600,000
COPD	10,800,000
Chronic Bronchitis only (age 18+)	8,200,000
Emphysema only (age 18+)	1,700,000
Chronic Bronchitis and Emphysema (age 18+)	900,000
Anemias (all forms) (1996)	3,500,000

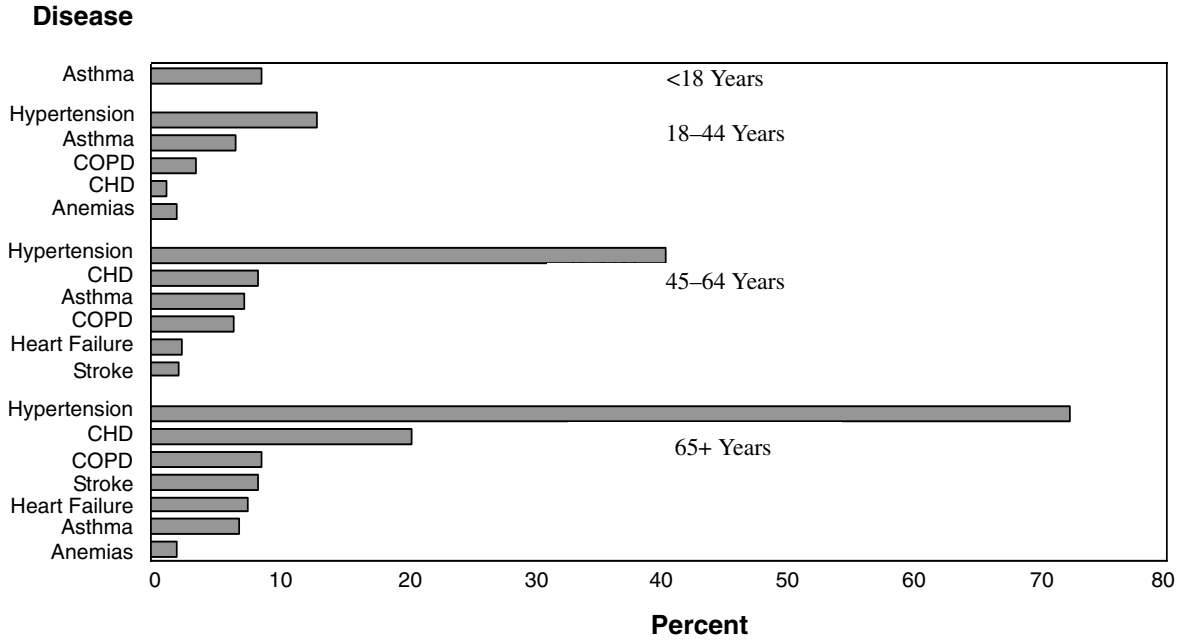
* Systolic blood pressure ≥ 140 mm Hg, diastolic blood pressure ≥ 90 mm Hg, on antihypertensive medication, or told twice of having hypertension.
Note: Some persons are included in more than one diagnostic group, and persons with more than one form of anemia are counted more than once.
Sources: Extrapolated to United States from National Health and Nutrition Examination Survey (NHANES), 1999–2002, and National Health Interview Survey (NHIS), 2002, 2003.

Prevalence of Cardiovascular Diseases* in Adults by Age, U.S., 1999–2002



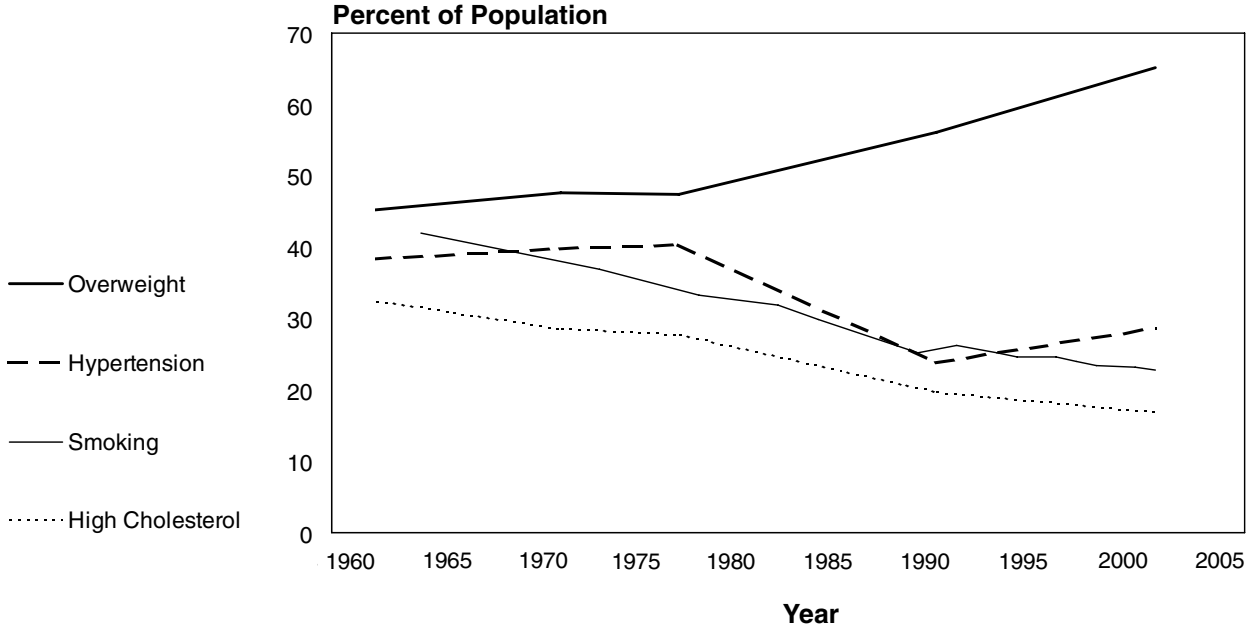
* Hypertension, CHD, cerebrovascular disease, or heart failure.
Hypertension = systolic blood pressure ≥ 140 mm Hg, diastolic bloo d pressure ≥ 90 mm Hg, on antihypertensive medication, or told twice of having hypertension.
Source: NHANES, 1999–2002.

Prevalence of Common Cardiovascular, Lung, and Blood Diseases by Age, U.S., 2002



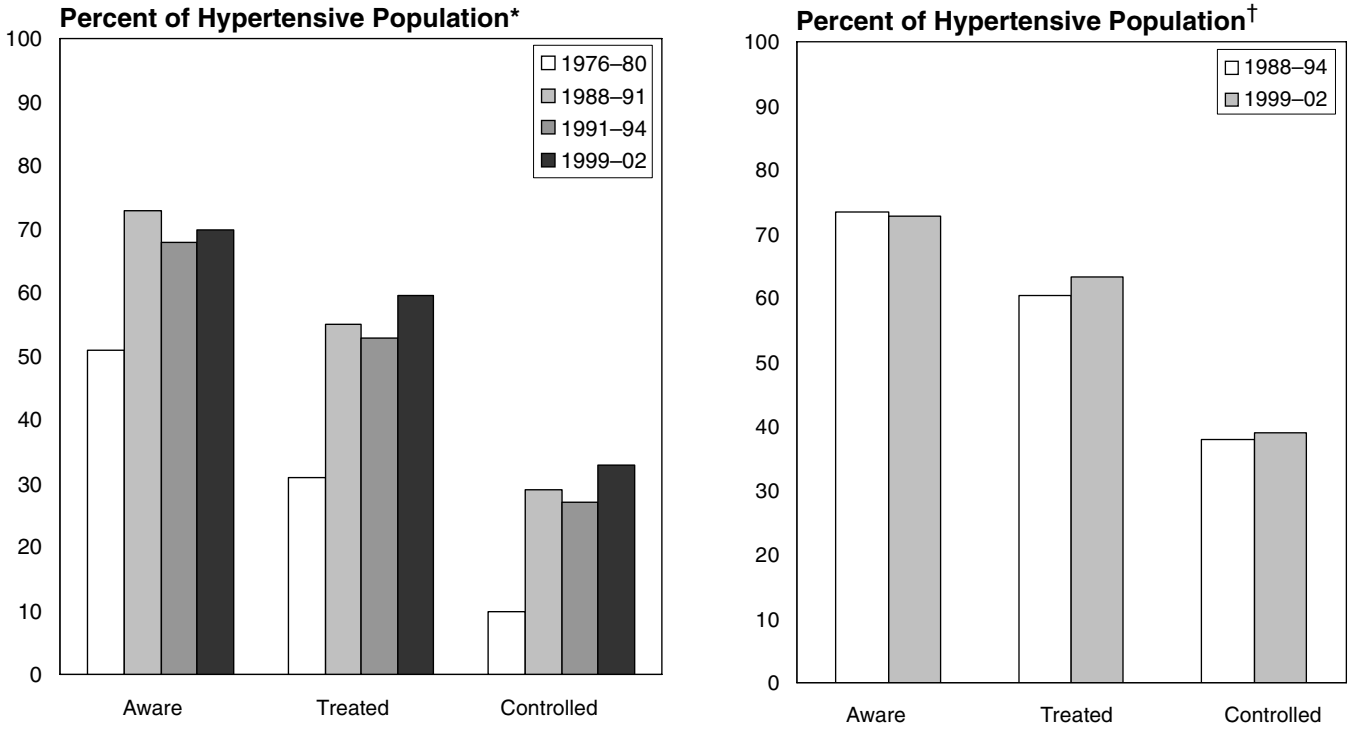
Note: Numbers depicted in bars are not additive by disease because some persons have more than one disease.
Source: NHIS 1996 for anemias, 2004 for lung diseases, and NHANES 1999–2002 for CVD.

Prevalence of Cardiovascular Disease Risk Factors* in Adults, U.S., 1961–2001



* Age-adjusted.
Note: Hypertension is systolic blood pressure ≥ 140 mm Hg, diastolic blood pressure is ≥ 90 mm Hg, or on antihypertensive medication. High cholesterol is 240+ mg/dl. Overweight is BMI 25+ kg/m^2.
Source: NHIS for smoking (age 18+) and NHANES for the other risk factors (ages 20–74).

Hypertensive Population Aware, Treated, and Controlled, Age 18+, U.S., 1976–80 to 1999–2002

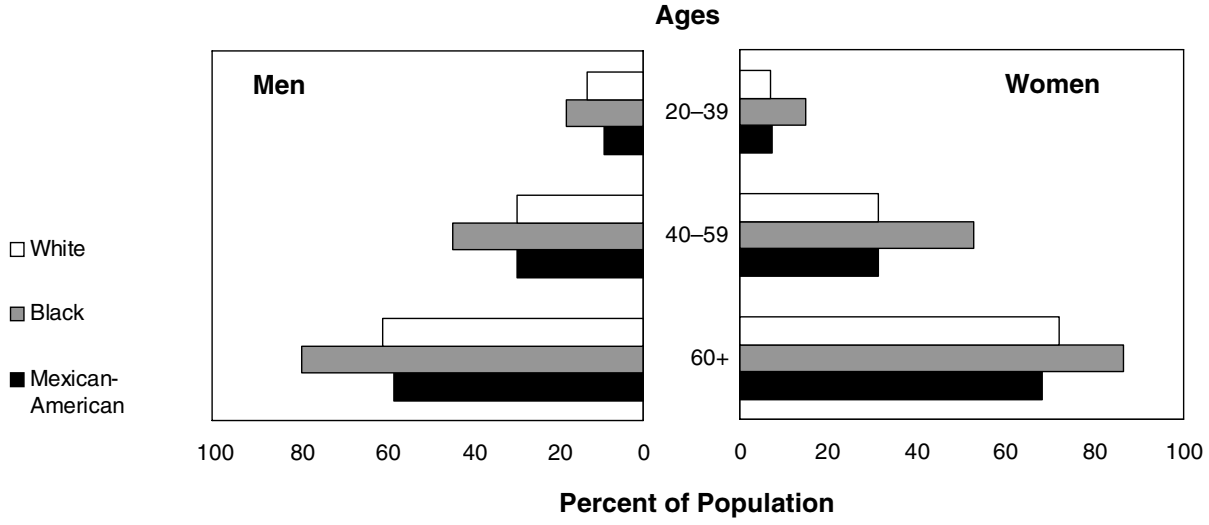


* Systolic blood pressure ≥ 140 mm Hg, diastolic blood pressure ≥ 90 mm Hg, or on antihypertensive medication.

† Systolic blood pressure ≥ 140 mm Hg, diastolic blood pressure ≥ 90 mm Hg, on antihypertensive medication, or told twice of having hypertension. Here, "treated" includes medication use and other means.

Source: NHANES, NCHS.

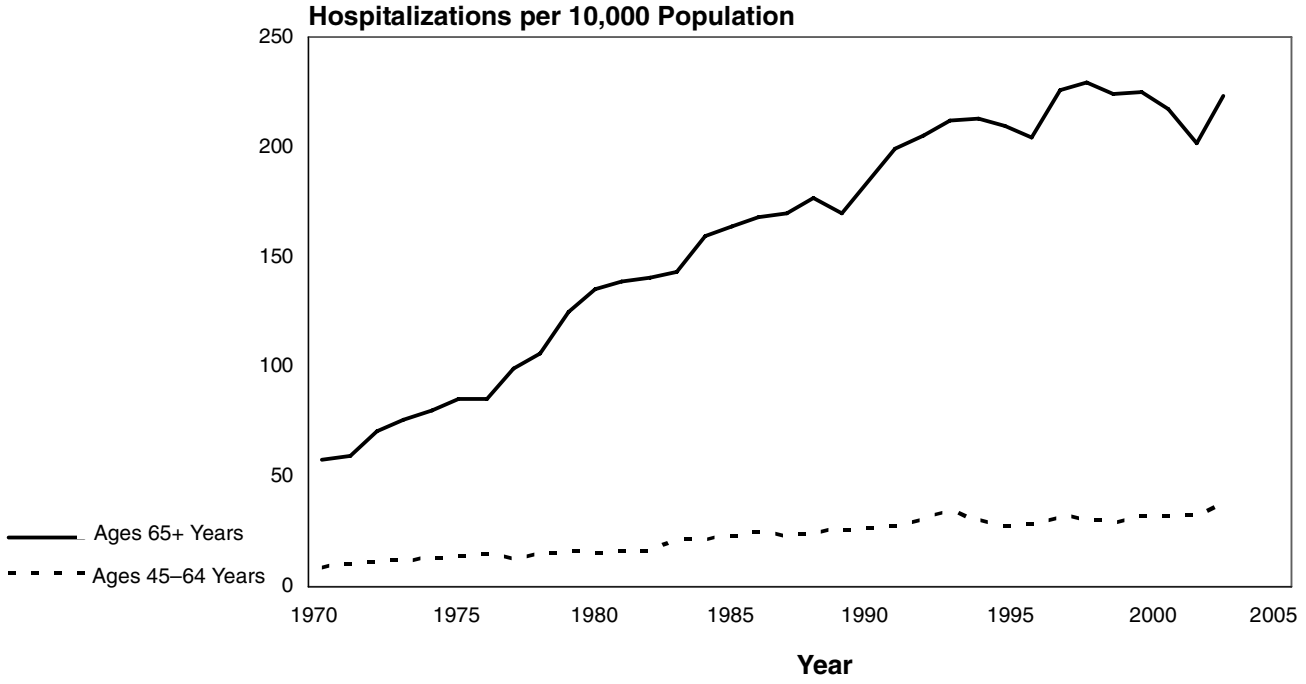
Adult Population With Hypertension* by Age, Gender, and Race, U.S., 1999–2002



* Systolic blood pressure ≥ 140 mm Hg, diastolic blood pressure ≥ 90 mm Hg, on antihypertensive medication, or told twice of having hypertension.

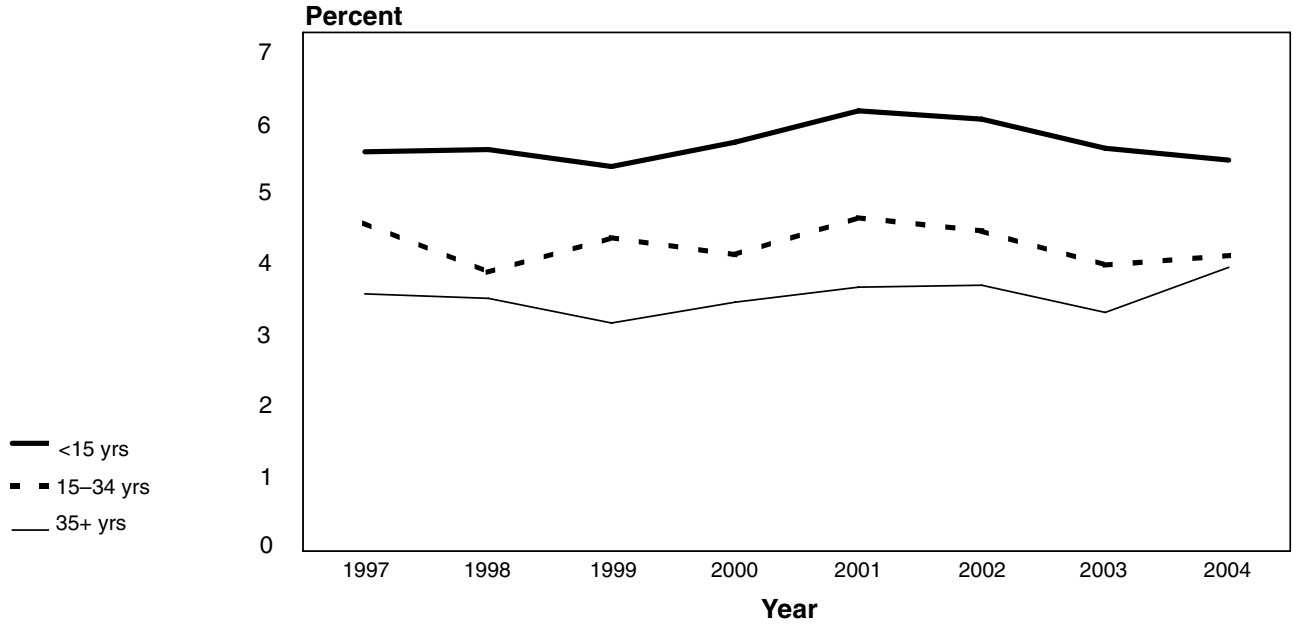
Source: NHANES, NCHS.

Hospitalization Rates for Heart Failure, Ages 45–64 Years and 65+ Years, U.S., 1971–2003



Source: National Hospital Discharge Survey, NCHS.

Persons Experiencing Asthma Episodes in Previous 12 Months by Age, U.S., 1997–2004



Source: National Health Interview Survey, NCHS.

Direct and Indirect Economic Costs of Illness by Major Diagnosis, U.S., 2006

	Amount (Dollars in Billions)				Percent Distribution			
		Indirect Costs				Indirect Costs		
	Direct Costs*	Morbidity†	Mortality‡	Total	Direct Costs	Morbidity	Mortality	Total
Cardiovascular Disease	$257.6	$35.6	$109.8	$403.0	14.6%	17.0%	20.7%	16.1%
(including Blood Clotting)§	(60.5)	(7.9)	(25.6)	(94.0)	(3.4)	(3.8)	(4.8)	(3.8)
Lung Diseases**	87.0	27.4	29.8	144.2	4.9	13.0	5.6	5.8
Blood Diseases	9.0	0.7	2.9	12.6	0.5	0.3	0.5	0.5
Subtotal	353.6	63.7	142.5	559.8	20.1	30.3	26.9	22.4
Diseases of the Digestive System	179.2	10.8	24.0	214.0	10.2	5.1	4.5	8.6
Neoplasms	78.2	17.9	110.2	206.3	4.4	8.5	20.8	8.3
Mental Disorders	141.62	27.6	8.4	177.6	8.0	13.1	1.6	7.1
Diseases of the Nervous System	147.6	8.2	11.9	167.7	8.4	3.9	2.2	6.7
Diseases of the Musculoskeletal System	100.5	21.4	2.7	124.6	5.7	10.2	0.5	5.0
Diseases of the Genitourinary System	74.4	5.5	6.0	85.9	4.2	2.6	1.1	3.4
Endocrine, Nutritional, and Metabolic Diseases	70.8	6.9	19.1	96.8	4.0	3.3	3.6	3.9
Infectious and Parasitic Diseases	36.1	12.7	26.5	75.3	2.0	6.1	5.0	3.0
Diseases of the Skin	39.7	1.6	0.6	41.9	2.3	0.8	0.1	1.7
Other and Unallocated to Diseases	537.8	33.6	177.9	749.3	30.6	16.0	33.6	30.0
Total	**$1,759.5**	**$209.9**	**$529.8**	**$2,499.2**	**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 2006 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 2006 total by type of direct cost.

† Morbidity costs were estimated for 2006 by multiplying NCHS estimates for 1980 by a 1980–2006 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 2006 by first multiplying the number of deaths in 2002 in each age- and sex-specific group by the 2002 present value of lifetime earnings (latest available) discounted at 3 percent; second, summing these estimates for each diagnostic group; and third, multiplying the estimates by a 2002–2006 inflation factor (1.07) based on change in mean earnings.

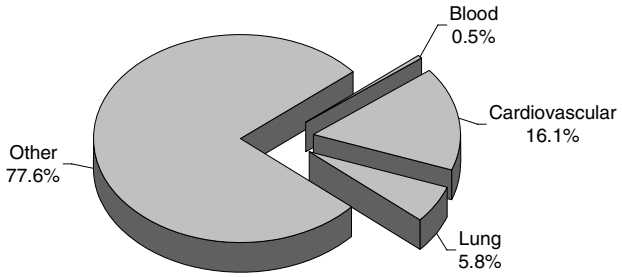
§ Costs of blood-clotting disease are estimated from predetermined proportions of CVD morbidity and mortality statistics for MI, cerebrovascular diseases, and diseases of arteries.

** Does not include lung cancer or leukemia.

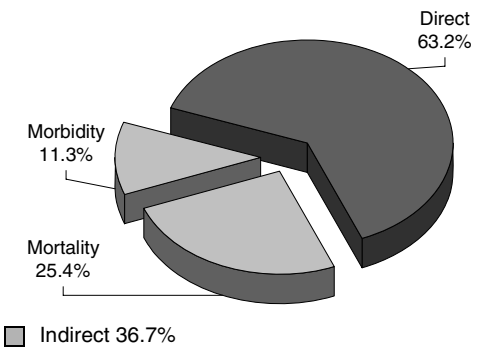
Note: Numbers may not add to totals due to rounding.

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

Total Economic Costs, U.S., 2006



Economic Costs: Cardiovascular, Lung, and Blood Diseases, U.S., 2006



5. Institute-Initiated Programs Starting in FY 2005

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

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

RFA, RFP, and PA concepts prepared by the Institute are presented to the BEA, which reviews and prioritizes them. The concepts, along with the comments from the BEA, are then sent to the NHLBAC for review, comment, and concurrence. Initiatives that receive the concurrence of the NHLBAC are considered further by the NHLBI Director in the context of the Institute's budget, program priorities, review workload, and proposed mechanisms. These considerations guide the Director's subsequent decisions to approve initiatives for release. RFAs, RFPs, and PAs are announced in the weekly publication, 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 2005 are presented below according to NHLBI scientific program. Also described are trans-NIH and interagency initiatives in which the NHLBI is participating.

Heart and Vascular Diseases Program

Initiatives Being Renewed

Atherosclerosis Risk in Communities (ARIC) Study

The purpose of this renewal is to assess trends in incidence of myocardial infarction (MI) and heart failure and to continue identification of their risk factors in four diverse communities. Specifically, the study will extend community surveillance of trends in MI incidence through 2009 and beyond age 74, initiate surveillance of heart failure, and continue investigation of new risk factors (e.g., first time reports of carotid intimal–medial thickness predicting CHD and stroke) for CHD and heart failure in the ARIC cohort subjects aged 45–64 at study entry.

Cardiovascular Health Study: Transition Phase

The purpose of this renewal is to enhance the use of data and samples from the Cardiovascular Health Study (CHS) during a transition period from the current contract-funded, NHLBI-directed program to one directed by a steering committee of investigators with independently acquired grants. The goals are to maintain the core coordinating center and laboratory support; continue follow-up of participants for cardiovascular events and maintenance of sample repository; ensure open access to CHS data and specimens for the entire scientific community; and promote innovative use of the resource by new collaborators who will develop independently funded research projects.

Family Blood Pressure Program Extension

The purpose of this renewal is to identify and characterize the genes that contribute to hypertension and related conditions in multiple racial groups. The program will also investigate the pathways through which genetic variation translates into differences in blood pressure levels and risks of hypertension.

Genetics of Coronary Artery Disease in Alaska Natives (GOCADAN) Study

The purpose of this renewal is to identify and map the genes that contribute to CVD in a population of isolated Alaska Natives whose traditional lifestyle is being altered by mechanization and a westernized diet. The population is beginning to show a marked acceleration in the prevalence of atherosclerosis and coronary artery disease.

Strong Heart Study

The purpose of this renewal is to extend support for Phase V of the Strong Heart Study, which is evaluating CVD and its risk factors, especially obesity and type 2 diabetes, in American Indians. Phase V seeks to determine the genetic and environmental contributors of CVD in extended families; continue the mortality and morbidity surveillance of the original cohort along with initiating annual mortality surveillance and limited morbidity follow-up of the noncohort family members; and reexamine family members so that changes in risk factors can be analyzed and genetic effects on changes can be estimated.

New Initiatives

Community-Responsive Intervention To Reduce Cardiovascular Risk in American Indians and Alaska Natives

The purpose of this cooperative agreement is to evaluate the effectiveness of behavioral interventions such as weight reduction, regular physical activity, and smoking cessation to reduce cardiovascular risk in American Indians and Alaska Natives. Investigators will develop and test culturally appropriate interventions that can be incorporated into clinical programs of the community health care systems or delivered through public-health approaches in Native communities.

Specialized Centers of Clinically Oriented Research in Cardiac Dysfunction and Disease

The purpose of this SCCOR is to improve understanding of the disease process within the myocardium through multidisciplinary research that integrates molecular, structural, mechanical, and electrical elements into a cohesive picture. The goal is to translate research findings into more effective methods of treatment, diagnosis, and prevention of cardiac disorders, including ischemic and other cardiomyopathies, left ventricular dysfunction, metabolic abnormalities, congestive heart failure, and rhythm disturbances. Because some segments of the population suffer from heart disease disproportionately, investigators will emphasize research that addresses issues related to health disparities.

Lung Diseases Program

Initiative Being Renewed

Acute Respiratory Distress Syndrome Clinical Network (ARDSNet)

The purpose of this renewal is to conduct controlled clinical trials of treatments and management practices for acute lung injury and acute respiratory distress syndrome.

New Initiatives

Causes and Mechanisms of COPD Exacerbations

The purpose of this RFA is to investigate the causes of, and the molecular pathways involved in, acute exacerbation of COPD. The goal is to identify specific new targets for more effective preventive and therapeutic interventions.

Idiopathic Pulmonary Fibrosis Clinical Research Network

The purpose of this RFA is to establish a clinical research network to design and perform multiple therapeutic trials in patients with newly diagnosed idiopathic pulmonary fibrosis. The trials will evaluate existing or new medications, combinations of medications, and defined management strategies.

Pathogenesis of SARS Lung Disease: In Vitro Studies and Animal Models

The purpose of this PA is to encourage research that will rapidly advance understanding of the pathogenesis of severe SARS in the lung using in vitro techniques, existing animal models of related coronavirus infections, and appropriate animal models of SARS.

Blood Diseases and Resources Program

Initiative Being Renewed

Thalassemia Clinical Research Network

The purpose of this renewal is to conduct clinical trials to evaluate existing and new therapies for thalassemia. The network will move effective therapies from the laboratory to the bedside through rapid and systematic collaborative testing in phase II and phase III clinical trials.

New Initiatives

Cellular and Genetic Discovery Toward Curative Therapy in Myeloproliferative Disorders (MPD)

The purpose of this RFA is to stimulate research to discover cellular and genetic markers associated with the origin and progression of MPD. Investigators will ultimately seek to translate research findings into innovative treatments that will cure MPD.

Development of a Health-Related Quality of Life Questionnaire in Sickle Cell Disease

The purpose of this RFP is to develop a quality of life questionnaire and related materials to be used in clinical trials and outcomes research among adults with SCD, and subsequently to assist researchers who choose to use the new products.

Improved Therapy for Hemophilia and Hereditary Bleeding Disorders

The purpose of this RFA is to develop improved therapies, with the goal of finding a cure, for hemophilia and other hereditary bleeding disorders. The focus is on stimulating research to improve therapy, and enhance understanding of immune response and safety issues related to new therapeutics, gene transfer, or cell-based therapies for bleeding disorders. The RFA is cosponsored by the National Hemophilia Foundation.

Myelodysplastic Syndrome: Seeking Cure Through Discovery on Pathogenesis and Disease Progression

The purpose of this RFA is to determine the etiology and pathophysiology of myelodysplastic syndrome. Investigators will ultimately seek to find a cure for the syndrome.

Specialized Centers of Clinically Oriented Research (SCCOR) in Transfusion Biology and Medicine

The purpose of this SCCOR is to foster multidisciplinary research in transfusion biology and medicine that will improve the safety, efficacy, and availability of blood, blood components, and plasma derivatives. Investigators will apply their findings to evaluate the best approaches to provide blood- and bone-marrow-derived components to patients.

Trans-NHLBI

Initiatives Being Renewed

Competing Continuation Awards of SBIR Phase II Grants for Heart, Lung, Blood, and Sleep Disorders

The purpose of this renewal is to support SBIR Phase II awardees in further pursuing development and assessment of devices or conducting preclinical studies of products or devices relevant to the NHLBI mission prior to clinical evaluation and Federal regulatory agency approval.

NHLBI HBCU Research Scientist Award Extension

The purpose of this renewal is to facilitate research capacity building at the four historically black colleges and universities (HBCU) that were awarded the NHLBI Research Scientist Awards in 1996 to conduct biomedical or behavioral research in cardiovascular, lung, or blood health and disease, transfusion medicine, or sleep disorders. The program seeks to increase the number of minority individuals involved in biomedical and behavioral research and to reduce health disparities.

NHLBI Minority Institutional Research Training Program

The purpose of this renewal is to provide full-time research training to graduate, postdoctoral, or health professional students at minority schools for investigative careers in cardiovascular, pulmonary, and blood diseases and sleep disorders.

Programs of Excellence in Gene Therapy for Heart, Lung, and Blood Diseases

The purpose of this renewal is to continue support to the four NHLBI Programs of Excellence in Gene Therapy initiated in FY 2000. The renewal will emphasize preclinical projects to facilitate the translation of gene therapy into clinical studies, clinical studies to test safety and efficacy of gene therapy, National Cores to provide resources and services to NHLBI investigators at no cost, and training positions in clinical projects to train M.D. and Ph.D. scientists in conducting gene therapy clinical trials.

New Initiatives

Bioengineering Approaches to Energy Balance and Obesity

The purpose of this RFA is to encourage engineers, physical scientists, and scientists from other relevant disciplines with expertise in obesity and nutrition to develop and evaluate new technologies, instrumentation, and medical devices to address clinical problems related to energy balance, intake, and expenditure. The goal is to increase the number of useful technologies and tools available to scientists to facilitate research and support behavioral changes to address such problems as weight control and obesity.

NHLBI Clinical Proteomics Programs

The purpose of this RFA is to establish clinical proteomics programs to validate existing and new candidate protein markers that will enable early detection of heart, lung, and blood diseases and sleep disorders. The programs will facilitate validation of protein panels that will not only provide diagnostic and prognostic information, but also mechanistic insight into therapeutic responses and new targets for interventions. In addition, the RFA seeks to establish a high-quality education and skills development program to ensure that scientists develop the expertise needed to address the complex challenges in clinical proteomics.

NHLBI Programs of Excellence in Nanotechnology

The purpose of this RFA is to create multidisciplinary teams capable of developing and applying nanotechnology and nanoscience solutions to the diagnosis and treatment of heart, lung, and blood diseases and sleep disorders.

Pulmonary Complications of Sickle Cell Disease

The purpose of this RFA is to encourage collaborative research between investigators in hematology and pulmonary science that combines basic and clinical approaches. The goals are to translate basic research findings into clinical applications to treat pulmonary complications of SCD and to encourage clinical and basic research on the role of upper airway obstruction and sleep disturbances in acute chest syndrome and other pulmonary complications of SCD.

Specialized Centers for Cell-Based Therapy (SCCT) for Heart, Lung, and Blood Diseases

The purpose of this RFA is to establish SCCT to conduct preclinical and clinical studies on cell-based therapy for treatment of heart, lung, and blood diseases. Investigators will seek to translate basic research findings into clinical applications for treatment of heart, lung, and blood diseases. They will have 1 to 2 years to do preclinical studies to meet the requirements for an Investigational New Drug application prior to initiating clinical studies. By the beginning of the third year, the centers should be ready to initiate clinical studies.

Trans-NIH

Initiatives Being Renewed

Jackson Heart Study

The purpose of this renewal is to investigate genetic and environmental causes of CVD in blacks. It also will build research capabilities in minority institutions, address the critical shortage of minority investigators in epidemiology and prevention, and reduce barriers to dissemination and utilization of health information in a minority population.

Phamacogenetics Research Network and Knowledge Base

The purpose of this renewal is to continue support for a network of collaborative groups that are investigating the influence of human genetic variations on the response to drugs and using the information to develop a public pharmacogenetic knowledge base.

New Initiatives

Asthma Exacerbations: Biology and Disease Progression

The purpose of this RFA is to elucidate the mechanisms and consequences of asthma exacerbation; define the pathways that are altered during resolution of exacerbations; and determine their impact on lung function, physiology, and disease state. Research findings will provide the basis for developing more effective treatments that will control symptoms and exacerbations while maintaining or improving lung function.

Bioengineering Research Partnerships

The purpose of this PA is to support multidisciplinary research teams in applying integrative, systems approaches to improve understanding of disease and its diagnosis, treatment, and prevention or to understand health and behavior.

Centers of Excellence in Translational Human Stem Cell Research

The purpose of this RFA is to establish Centers of Excellence in Translational Human Stem Cell Research to accelerate the application of the latest advances in human stem cell biology to the development of diagnostic or therapeutic uses for human disorders. The Centers will bring together basic stem cell biologists and clinicians with disease-specific expertise, physicians and surgeons skilled in new modes of cell delivery, and investigators experienced in developing and assessing animal models of human diseases to create new interdisciplinary research teams and to conduct preclinical studies for cell-based therapy.

Prevention and Treatment of Childhood Obesity in Primary Care Settings

The purpose of this RFA is to test, in a primary care setting, interventions to prevent excessive weight gain in children at risk for obesity and to prevent further weight gain or to promote weight loss in those who are already obese. Interventions will focus on improving dietary and physical activity behaviors.

Mentored Scientist Development Award in Research Ethics (K01)

The purpose of this PAR is to support research ethics training in biomedical, behavioral, or public health research, particularly research involving human participants, by health professionals working at academic and other health-related institutions. The candidate must identify a mentor with extensive research and academic experience in ethical issues related to biomedical research.

Molecular Screening Assay Development for Sickle Cell Disease

The purpose of this RFA is to support the development and adaptation of biological assays for automated, high throughput screening of compounds that can potentially be used to improve the understanding of the biology of SCD and lead to new agents for treatment.

Midcareer Investigator Award in Patient-Oriented Research (K24)

The purpose of this PA is to encourage established, midcareer clinician scientists to devote more time to patient-oriented research and to act as research mentors for beginning clinical investigators.

Salt Sensitivity Diagnostic Test

The purpose of this PA is to stimulate research focused on developing a noninvasive or minimally invasive, rapid, and practical diagnostic test for salt sensitivity of blood pressure in patients during routine physical examination. Ideally, the test should correlate with the long-term changes with blood pressure resulting from high salt intake.

School-Based Intervention To Prevent Obesity

The purpose of this PA is to encourage partnerships between academic institutions and school systems to develop and evaluate behavioral interventions designed to increase children's physical activity and decrease the amount of time that they devote to sedentary activities such as watching television or playing computer games.

Trans-PHS

New Initiatives

Characterization of Genetic Variants of HIV and Other Blood-Borne Viruses

The purpose of this initiative is to characterize emerging genetic variants of HIV and other agents transmitted by blood transfusion and to determine their effect on the performance of licensed tests used to screen donated blood.

Development of Serological Assays To Distinguish Incident HIV Infections in Vaccine Recipients Developing HIV Antibodies During Field Tests

The purpose of this initiative is to develop an enzymatic immunoassay for the differential diagnosis of HIV-1 infection in the presence of HIV vaccine-generated antibodies. The project is predicated on the need to distinguish true HIV infections from vaccine-induced antibody responses in populations receiving newly formulated complex HIV vaccines.

Mechanical Circulatory Support for End-Stage Heart Failure: Interagency Registry

The purpose of this RFP is to establish a data and clinical coordinating center to manage a registry of patients receiving a mechanical circulatory support device to treat heart failure. The registry will chronicle device implantation procedures, indications, and outcomes; identify complications and risk factors for complications; develop predictive outcome models; provide blood

and tissue for genomic and proteomic investigations; generate evidence to permit better device development, patient selection, and operating procedures; and generate hypotheses for clinical trials and studies that will improve clinical outcomes.

Interagency

New Initiative

Understanding and Promoting Health Literacy

The purpose of this PA is to increase scientific understanding of the nature of health literacy and its relationship to healthy behaviors, illness prevention and treatment, chronic disease management, health disparities, risk assessment of environmental factors, and health outcomes. Such knowledge will enable health care and public health systems to serve individuals and populations more effectively and to employ strategies that reduce health disparities in the population.

6. Institute Public Advisory Committees

National Heart, Lung, and Blood Advisory Council

Structure

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

Executive Secretary: Deborah P. Beebe, Ph.D., Director, Division of Extramural Affairs, NHLBI, National Institutes of Health, Bethesda, MD 20892; 301–435–0260

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

Members are appointed for overlapping terms of 4 years.

The Council includes the following ex officio members:

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

Functions

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

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

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

Meetings

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

National Heart, Lung, and Blood Advisory Council Membership*

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

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

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

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

Maria R. Costanzo, M.D. (2006)
Edward Heart Hospital

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

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

Frances C. Henderson, Ed.D. (2006)
Alcorn State University

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

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

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

Robert J. Mason, M.D. (2005)
National Jewish Medical and Research Center

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

Jane W. Newburger, M.D. (2005)
Children's Hospital Boston

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

George Thomas, M.D. (2005)
Bradenton Cardiology Center

Linda V. Van Horn, Ph.D. (2005)
Northwestern University Medical School

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 2005. 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: Theodore Wun, M.D., University of California, Davis Cancer Center

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*

Floyd D. Armstrong, Ph.D. (2008)
University of Miami School of Medicine

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

Paul S. Frenette, M.D. (2006)
Mount Sinai School of Medicine

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

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

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

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

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

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

Ex Officio Members

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

William H. Hannon, Ph.D.
Centers for Disease Control and Prevention

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

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

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

Sleep Disorders Research Advisory Board

Chair: Stuart F. Quan, M.D., University of Arizona College of Medicine

Executive Secretary: Carl E. Hunt, M.D., Director, National Center on Sleep Disorders Research, NHLBI, National Institutes of Health, Bethesda, MD 20892; 301–435–0199

The Sleep Disorders Research Advisory Board advises the Directors of the NIH, the NHLBI, and the National Center on Sleep Disorders Research 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*

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

Julianne Hill (2009)
Worldwide Skur, Inc.

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

* Current as of October 2005.

Kathryn A. Lee, Ph.D. (2006)
University of California, San Francisco

Rafael Pelayo, M.D. (2006)
Stanford University

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

Susan Redline, M.D. (2006)
Case Western Reserve University

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

Michael J. Sateia, M.D. (2006)
Dartmouth Medical School

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

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

Phyllis C. Zee, M.D., Ph.D. (2009)
Northwestern University Medical School

Ex Officio Members

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

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

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

Carl E. Hunt, M.D.
NCSDR, National Institutes of Health

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

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

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

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

Heart, Lung, and Blood Initial Review Group

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

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

Heart, Lung, and Blood Program Project Review Committee

Chair: Roy L. Silverstein, M.D., Cleveland Clinic Foundation

Scientific Review Administrator: Jeffery H. Hurst, Ph.D., Health Scientist Administrator, Division of Extramural Affairs, 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 Colorado Health Sciences Center

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

Jeffrey J. Fredberg, Ph.D. (2006)
Harvard University

* Current as of October 2005.

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

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

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

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

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

Brooke T. Mossman, Ph.D. (2006)
University of Vermont College of Medicine

Diane J. Nugent, M.D. (2009)
Children's Hospital of Orange County

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

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

Donna Przepiorka, M.D., Ph.D. (2007)
University of Tennessee College of Medicine

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

Susan S. Smyth, M.D., Ph.D. (2009)
University of North Carolina at Chapel Hill

Julian Solway, M.D. (2006)
University of Chicago

Michiko Watanabe, Ph.D. (2006)
Case Western Reserve University

Clinical Trials Review Committee

Chair: James E. Fish, M.D., Aventis Pharmaceuticals

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

The Clinical Trials Review Committee provides initial technical merit review for the National Heart, Lung, and Blood Advisory Council 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*

Shelly L. Carter, Sc.D. (2006)
The EMMES Corporation

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

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

Judith S. Hochman, M.D. (2006)
New York University School of Medicine

Ileana L. Pina, M.D. (2007)
Case Western Reserve University

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

David M. Reboussin, Ph.D. (2006)
Wake Forest University School of Medicine

National Heart, Lung, and Blood Institute Special Emphasis Panel

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

Board of Scientific Counselors

Chair: Pamela B. Davis, M.D., Case Western Reserve University

* Current as of October 2005.

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

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

Membership*

Ivor J. Benjamin, M.D. (2007)
University of Utah Health Sciences Center

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

Nelson J. Chao, M.D. (2006)
Duke University Medical Center

Kevin J. Foskett, Ph.D. (2006)
University of Pennsylvania

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

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

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

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

Stephen G. Young, M.D. (2006)
University of California, Los Angeles

* Current as of October 2005.

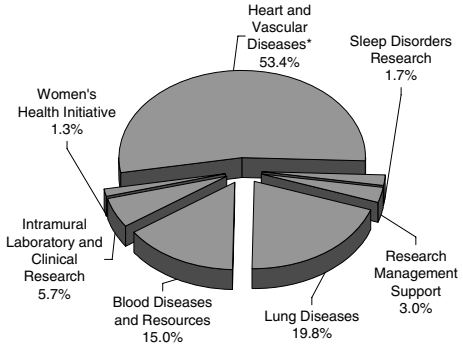
7. Fiscal Year 2005 Budget Overview

NHLBI Obligations by Funding Mechanism: Fiscal Year 2005

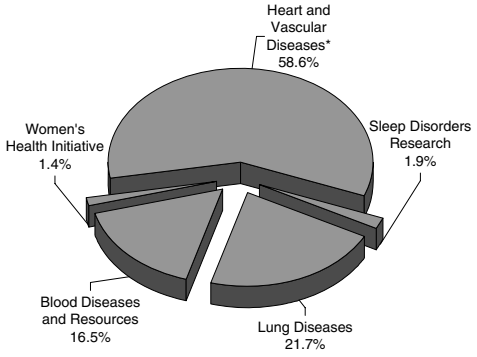
Funding Mechanism	Obligated Dollars* (Thousands)	Percent of Total NHLBI Budget
Research Project Grants†	$2,042,050	69.9%
SCORs/SCCORs	124,366	4.3
Sickle Cell Centers	24,314	0.8
Centers for AIDS Research	2,815	0.1
Other Research Grants	116,713	4.0
Research Careers Programs‡	*71,018*	*2.4*
Training Programs	88,346	3.0
Research and Development Contracts	268,573	9.2
Intramural Laboratory and Clinical Research	166,345	5.7
Research Management and Support§	89,051	3.0
Research Facilities Construction Grants	—	—
Total Obligations	**$2,922,573**	**100%**

* Excludes funds provided by other agencies by means of a reimbursable agreement.
† Includes $74,240 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.

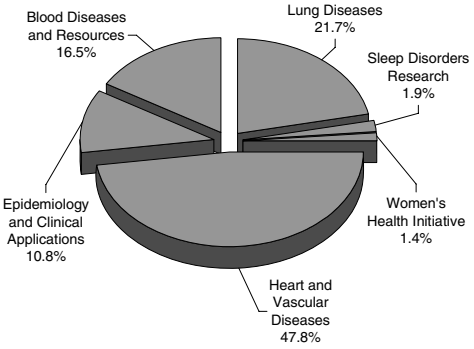
NHLBI Total Obligations by Budget Category



NHLBI Extramural Obligations by Program



NHLBI Extramural Obligations by Division



* Includes Heart and Vascular Diseases and Epidemiology and Clinical Applications.

For detailed data on FY 2005:

- 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 2005

Program	Obligated Dollars (Thousands)	Percent of NHLBI Extramural Budget
Heart and Vascular Diseases*	$1,561,843	58.6%
Lung Diseases	578,241	21.7
Blood Diseases and Resources	439,489	16.5
Sleep Disorders Research	49,778	1.9
Women's Health Initiative	37,826	1.4
Total, Extramural Obligations	**$2,667,177**	**100%**

* Includes Heart and Vascular Diseases and Epidemiology and Clinical Applications.

NHLBI Heart and Vascular Diseases Program* Obligations by Funding Mechanism: Fiscal Year 2005

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	$1,020,558	80.1%
SCORs/SCCORs	51,093	4.0
Other Research Grants	38,948	3.1
Research Career Programs†	*30,499*	*2.4*
Training Programs	45,952	3.6
Research and Development Contracts	117,792	9.2
Total, Heart and Vascular Diseases	**$1,274,343**	**100%**

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

NHLBI Epidemiology and Clinical Applications Program Obligations by Funding Mechanism: Fiscal Year 2005

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	$210,280	73.1%
SCORs/SCCORs	—	—
Other Research Grants	6,704	2.3
*Research Career Programs**	*5,299*	*1.8*
Training Programs	6,338	2.2
Research and Development Contracts	64,178	22.3
Total, Epidemiology and Clinical Applications	**$287,500**	**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 2005

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	$440,828	76.2%
SCORs/SCCORs	44,435	7.7
Other Research Grants	50,799	8.8
*Research Career Programs**	*22,148*	*3.8*
Training Programs	21,233	3.7
Research and Development Contracts	20,946	3.6
Total, Lung Diseases	**$578,241**	**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 2005

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	$330,166	75.1%
SCORs/SCCORs	22,630	5.1
Sickle Cell Centers	24,314	5.5
Centers for AIDS Research	2,815	0.6
Other Research Grants	18,641	4.2
*Research Career Programs**	*11,451*	*2.6*
Training Programs	13,092	3.0
Research and Development Contracts	27,831	6.3
Total, Blood Diseases and Resources	**$439,489**	**100%**

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

National Center on Sleep Disorders Research Program
Obligations by Budget Mechanism: Fiscal Year 2005

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	$40,218	80.8%
SCORs/SCCORs	6,208	12.5
Other Research Grants	1,621	3.3
*Research Career Programs**	*1,621*	*3.3*
Training Programs	1,731	3.5
Research and Development Contracts	—	—
Total, Sleep Disorders Research	**$49,778**	**100%**

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

Women's Health Initiative
Obligations by Funding Mechanism: Fiscal Year 2005

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	$ —	— %
SCORs/SCCORs	—	—
Other Research Grants	—	—
*Research Career Programs**	—	—
Training Programs	—	—
Research and Development Contracts	37,826	100
Total, Women's Health Initiative	**$37,826**	**100%**

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

8. Long-Term Trends

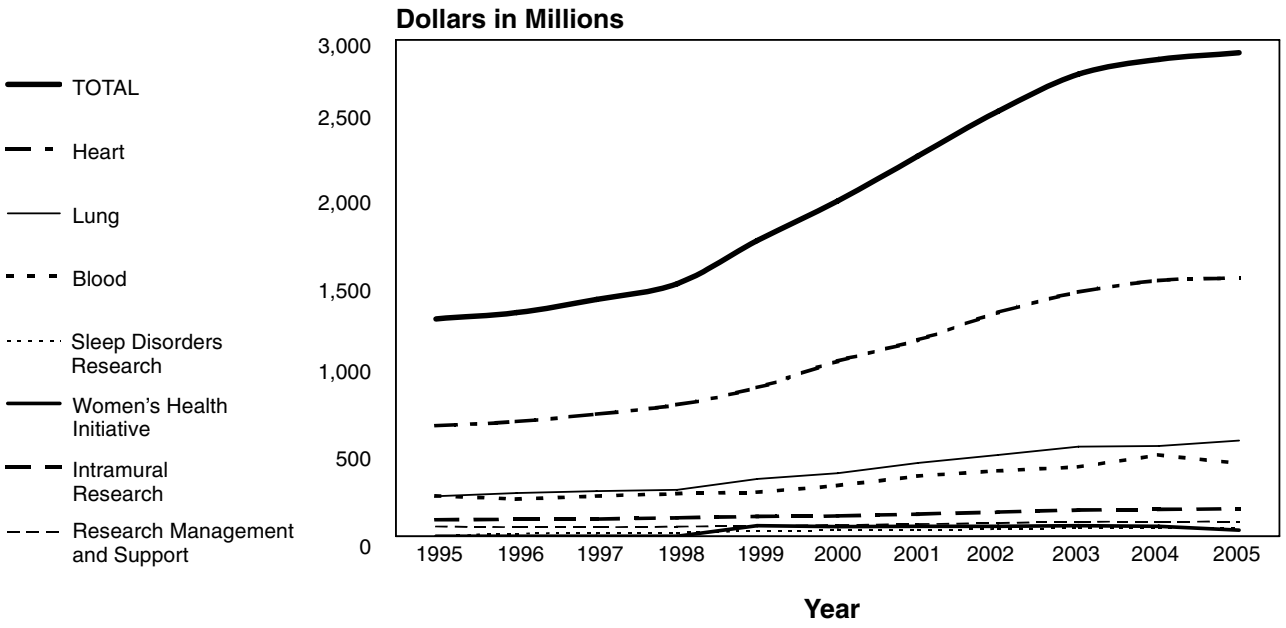
Budget History of the NHLBI: Fiscal Years 1950–2005

Dollars (Thousands)

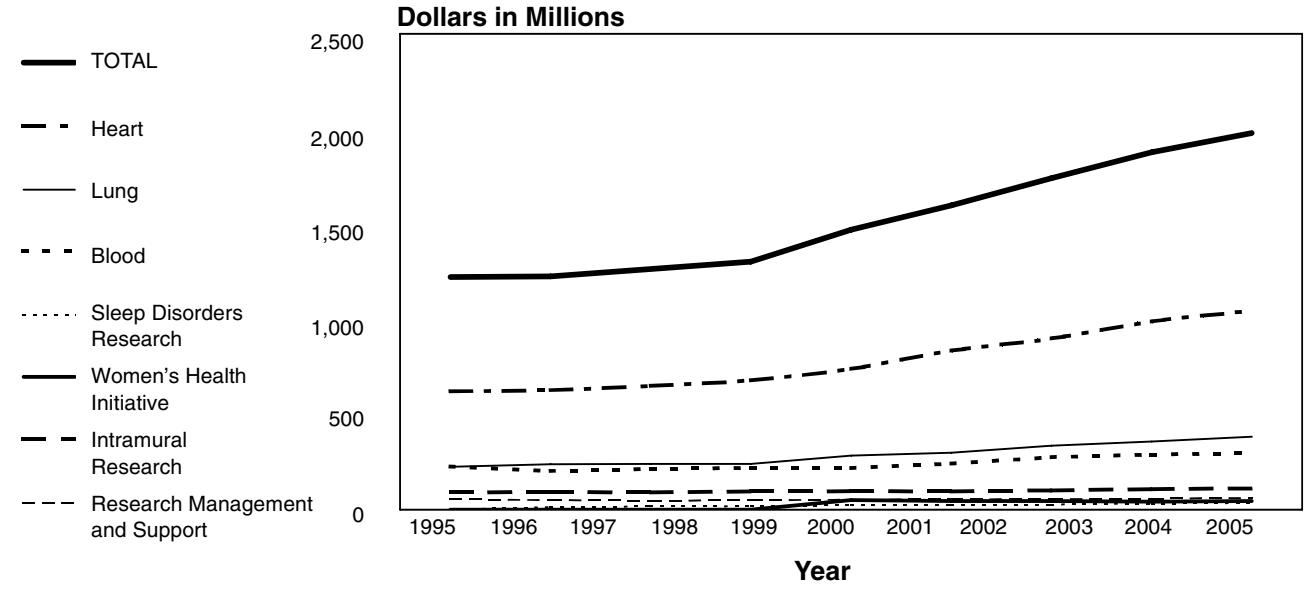
Fiscal Year	Budget Estimate to Congress	House Allowance	Senate Allowance	Appropriation	Obligations	Cumulative Fiscal Year Obligations
1950	$ 34,630	$ 11,575	$ 29,117	$ 16,075	$ 15,768	$ 15,768
1951	8,800	8,800	9,400	9,400	8,497	24,265
1952	10,237	10,074	10,156	10,083	9,850	34,115
1953	9,779	9,623	12,000	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

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 1995–2005
Current Dollars



NHLBI Total Obligations by Budget Category: Fiscal Years 1995–2005
Constant 1995 Dollars



NHLBI Total Obligations by Budget Category: Fiscal Years 1995–2005

Current Dollars (Millions)

	Fiscal Year										
Budget Category	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Extramural Research											
Heart	$ 668.9	$ 692.8	$ 737.9	$ 795.6	$ 898.0	$1,058.0	$1,186.6	$1,353.4	$1,475.6	$1,545.9	$1,561.8
Lung	243.0	261.9	273.4	281.7	346.2	380.4	444.0	490.5	541.1	544.1	578.3
Blood	244.6	224.3	242.7	257.5	266.1	305.9	364.0	396.0	419.3	429.2	439.5
Sleep Disorders Research	—	15.9	18.7	22.3	31.2	35.1	37.0	44.7	49.4	51.9	49.9
Women's Health Initiative	—	—	—	—	63.1	57.7	59.2	59.0	63.2	58.8	37.8
Intramural Research	98.9	101.8	104.4	111.6	119.5	122.3	133.7	146.7	157.8	164.2	166.3
Research Management and Support	59.5	54.8	54.6	57.6	63.9	67.9	73.5	79.4	87.3	88.5	89.0
Total	**$1,314.9**	**$1,351.5**	**$1,431.7**	**$1,526.3**	**$1,788.0**	**$2,027.3**	**$2,298.0**	**$2,569.8**	**$2,793.7**	**$2,882.6**	**$2,922.6**

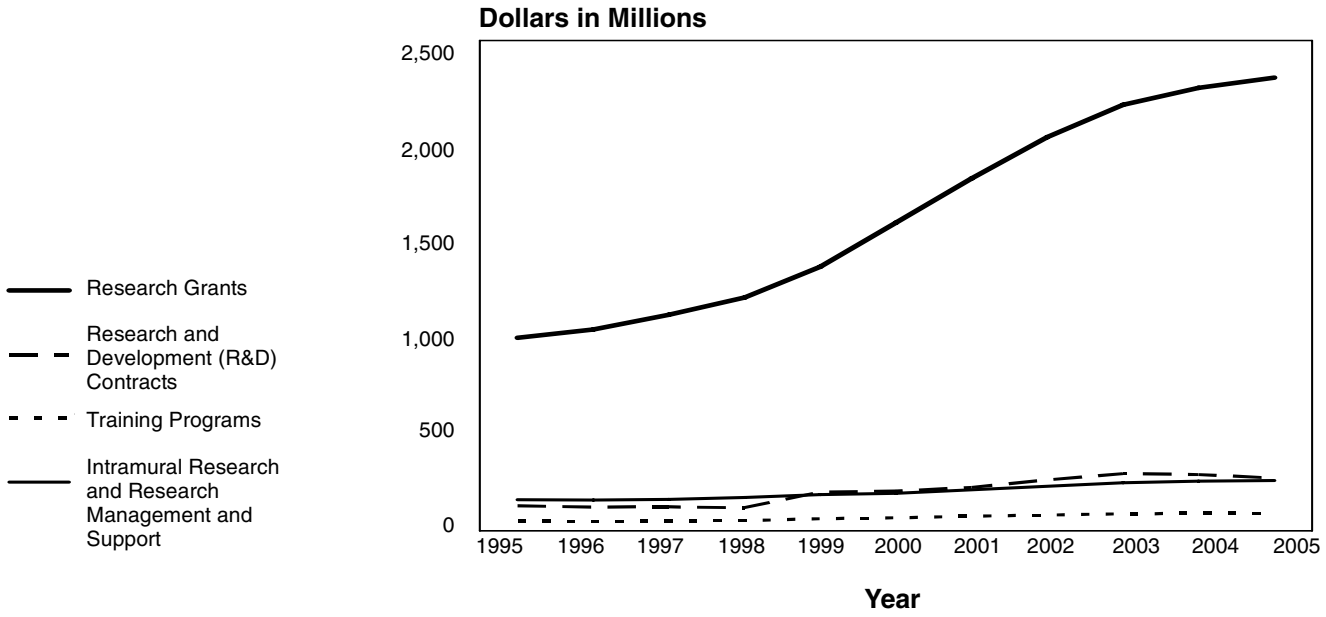
NHLBI Total Obligations by Budget Category: Fiscal Years 1995–2005

Constant 1995 Dollars (Millions)

	Fiscal Year										
Budget Category	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Extramural Research											
Heart	$ 622.2	$ 628.7	$ 651.3	$ 679.4	$ 739.1	$ 835.0	$ 898.9	$ 989.3	$1,045.8	$1,080.6	$1,165.5
Lung	226.0	237.7	241.3	240.6	284.9	300.2	336.4	358.6	383.5	380.3	431.6
Blood	227.5	203.5	214.2	219.9	219.0	241.4	275.8	289.5	297.2	300.0	328.0
Sleep Disorders Research	—	14.4	16.5	19.0	25.7	27.7	28.0	32.7	35.0	36.3	37.2
Women's Health Initiative	—	—	—	—	51.9	45.5	44.8	43.2	44.8	41.1	28.2
Intramural Research	92.0	92.4	92.1	95.3	98.4	96.5	101.3	107.2	111.8	114.8	124.1
Research Management and Support	55.3	49.7	48.2	49.2	52.6	53.6	55.7	58.0	61.9	61.9	66.4
Total	**$1,223.0**	**$1,226.4**	**$1,263.6**	**$1,303.4**	**$1,471.6**	**$1,599.9**	**$1,740.9**	**$1,878.5**	**$1,980.0**	**$2,015.0**	**$2,181.0**

This table is based on the Biomedical Research & Development Price Index through 2005.

NHLBI Total Obligations by Budget Mechanism: Fiscal Years 1995–2005



NHLBI Total Obligations by Budget Mechanism: Fiscal Years 1995–2005

Current Dollars (Millions)

	Fiscal Year										
Funding Mechanism	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Research Grants*	$ 982.6	$1,025.4	$1,100.9	$1,189.8	$1,346.6	$1,570.5	$1,796.9	$2,006.2	$2,172.3	$2,257.3	$2,310.2
Research and Development (R&D) Contracts	125.9	120.9	121.9	116.7	197.2	201.3	220.1	258.3	290.5	285.5	268.6
Training Programs	48.0	48.5	49.8	50.6	60.8	65.4	73.7	79.2	85.8	87.1	88.4
Intramural Research and Research Management and Support†	158.4	156.6	159.1	169.2	183.4	190.1	207.3	226.1	245.1	252.7	255.4
Total	**$1,314.9**	**$1,351.4**	**$1,431.7**	**$1,526.3**	**$1,788.0**	**$2,027.3**	**$2,298.0**	**$2,569.8**	**$2,793.7**	**$2,882.6**	**$2,922.6**

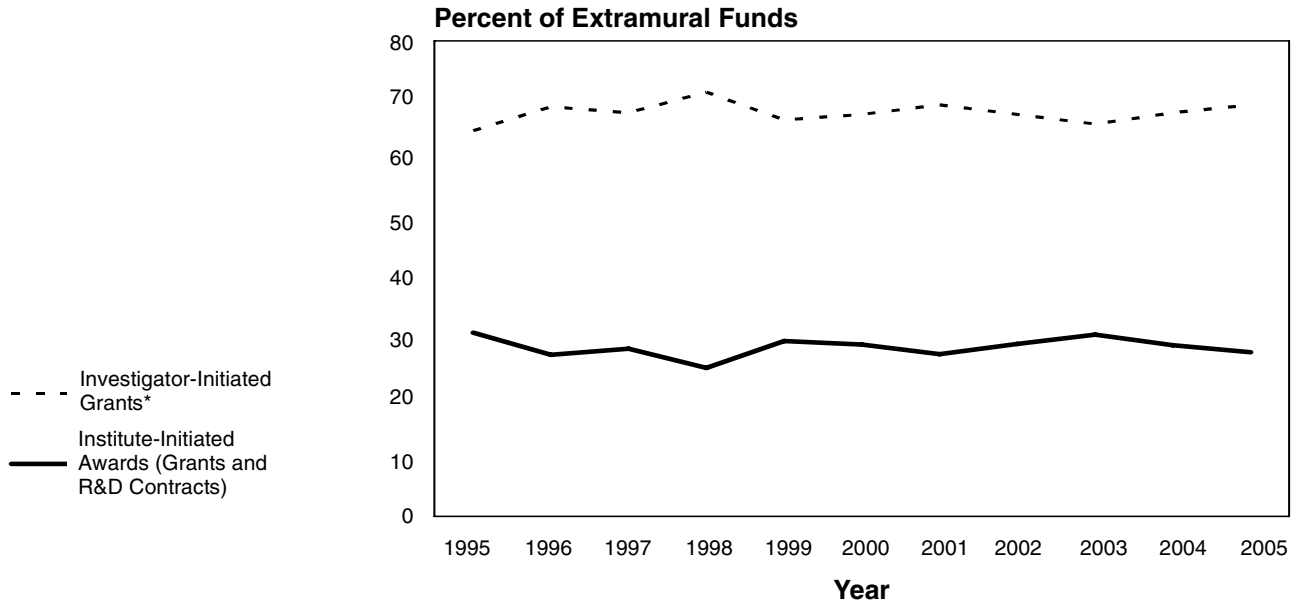
* Includes Research Career Programs.
† Excludes Office of the Director and DIR research contracts, which are included in R&D contracts.

NHLBI Employment: Fiscal Years 1995–2005

	Fiscal Year										
Staff	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
FTEs*	822	834	829	840	847	865	868	880	880	861	796

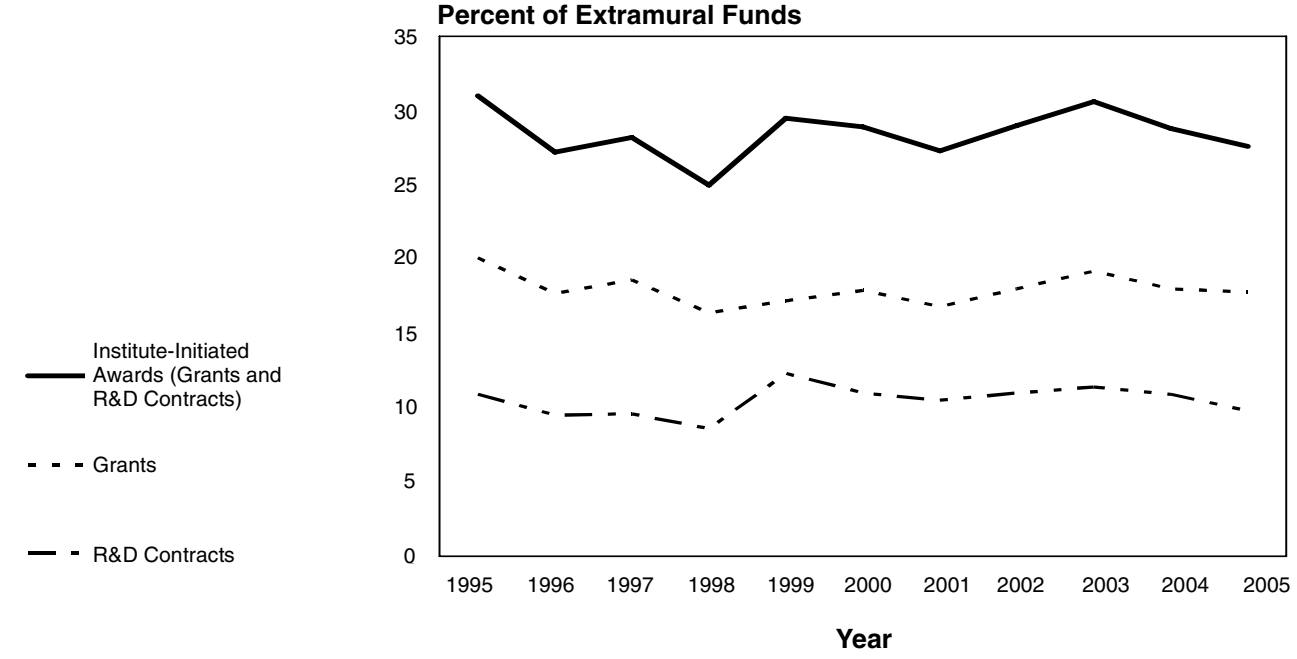
* Full-time equivalents.

NHLBI Institute-Initiated and Investigator-Initiated Awards: Fiscal Years 1995–2005



* Includes Research Career Programs.

NHLBI Grants and Research and Development Contracts as Subsets of Institute-Initiated Awards: Fiscal Years 1995–2005



NHLBI Extramural Programs: Fiscal Years 1995–2005

Dollars (Millions)

	Fiscal Year										
Funding Mechanism	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Investigator-Initiated Awards											
Investigator-Initiated Grants*	$ 719.0	$ 779.0	$ 830.3	$ 930.5	$1,022.2	$1,187.4	$1,388.8	$1,521.4	$1,616.1	$1,716.8	$1,747.2
Research Career Programs	31.7	33.8	33.9	36.1	47.7	54.2	57.5	63.5	65.8	67.8	71.0
Subtotal, Investigator-Initiated Awards	750.7	812.8	864.2	966.6	1,069.9	1,241.6	1,446.3	1,584.9	1,681.9	1,784.6	1,818.2
Institute-Initiated Awards											
Institute-Initiated Grants (RFA)	231.9	216.8	236.8	223.2	276.7	328.9	350.7	421.3	490.4	472.5	492.1
Centers†	*107.0*	*106.7*	*108.7*	*114.4*	*119.9*	*123.8*	*127.2*	*128.2*	*138.9*	*140.6*	*151.5*
R&D Contracts (RFP)	125.9	116.7	121.9	116.7	197.2	201.3	220.1	258.3	290.5	285.5	268.6
Subtotal, Institute-Initiated Awards	357.8	333.5	358.7	339.9	473.9	530.2	570.8	679.6	780.9	758.0	760.7
Training											
Individual Awards	7.1	7.3	6.8	7.6	9.2	8.9	8.9	9.5	8.6	8.8	9.7
Institutional Awards	40.9	41.2	43.0	43.0	51.6	56.5	64.8	69.7	77.2	78.4	78.7
Subtotal, Training	48.0	48.5	49.8	50.6	60.8	65.4	73.7	79.2	85.8	87.2	88.4
Total, Extramural	**$1,156.5**	**$1,194.8**	**$1,272.7**	**$1,357.1**	**$1,604.6**	**$1,837.2**	**$2,090.8**	**$2,343.7**	**$2,548.6**	**$2,629.8**	**$2,667.3**

* 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 1995–2005

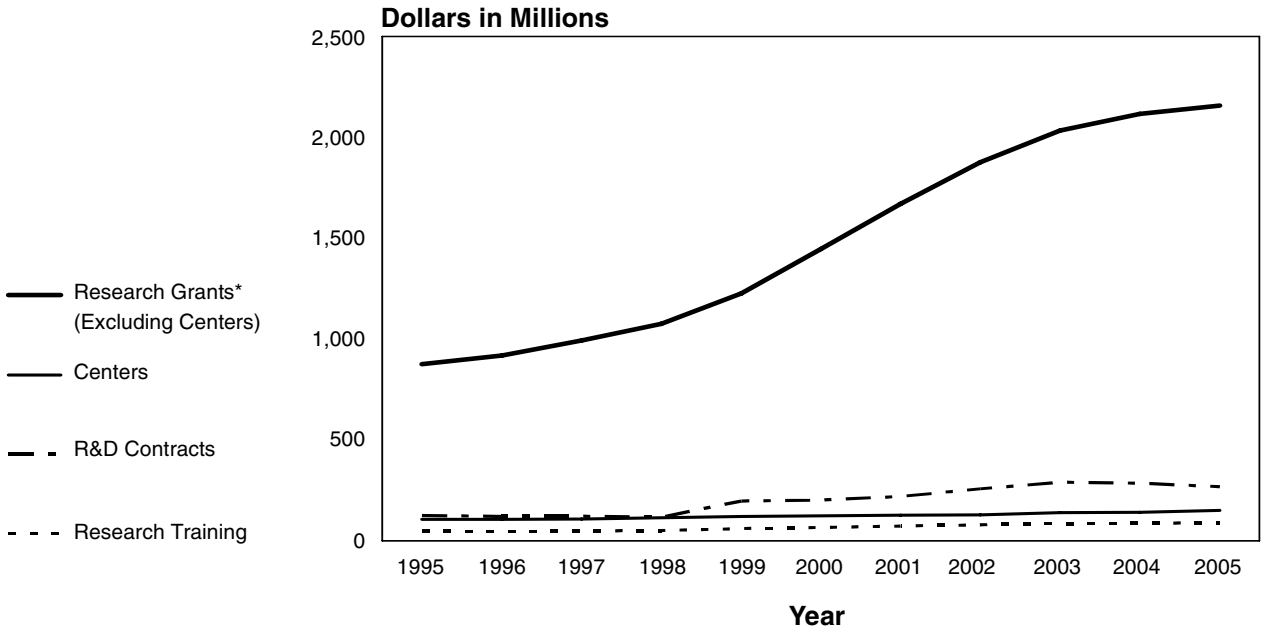
Percent of Total Extramural Budget

	Fiscal Year										
Funding Mechanism	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Investigator-Initiated Awards											
Investigator-Initiated Grants*	62.2%	65.2%	65.2%	68.6%	63.7%	64.6%	66.4%	64.9%	63.4%	65.3%	65.5%
Research Career Programs (K04, K06)	2.7	2.8	2.7	2.7	3.0	3.0	2.8	2.7	2.6	2.6	2.7
Subtotal, Investigator-Initiated Awards	64.9	68.0	67.9	71.2	66.7	67.6	69.2	67.6	66.0	67.9	68.2
Institute-Initiated Awards											
Institute-Initiated Grants (RFA)	20.1	18.1	18.6	16.4	17.2	17.9	16.8	18.0	19.2	18.0	18.4
Centers†	*9.3*	*8.9*	*8.5*	*8.4*	*7.5*	*6.7*	*6.1*	*5.5*	*5.5*	*5.3*	*5.7*
R&D Contracts (RFP)	10.9	9.8	9.6	8.6	12.3	11.0	10.5	11.0	11.4	10.9	10.1
Subtotal, Institute-Initiated Awards	30.9	27.9	28.2	25.0	29.5	28.9	27.3	29.0	30.6	28.8	28.5
Training											
Individual Awards	0.6	0.6	0.5	0.6	0.6	0.5	0.4	0.4	0.4	0.3	0.4
Institutional Awards	3.5	3.4	3.3	3.2	3.2	3.1	3.1	3.0	3.0	3.0	3.0
Subtotal, Training	4.2	4.0	3.9	3.8	3.8	3.6	3.5	3.4	3.4	3.3	3.3
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 1995–2005



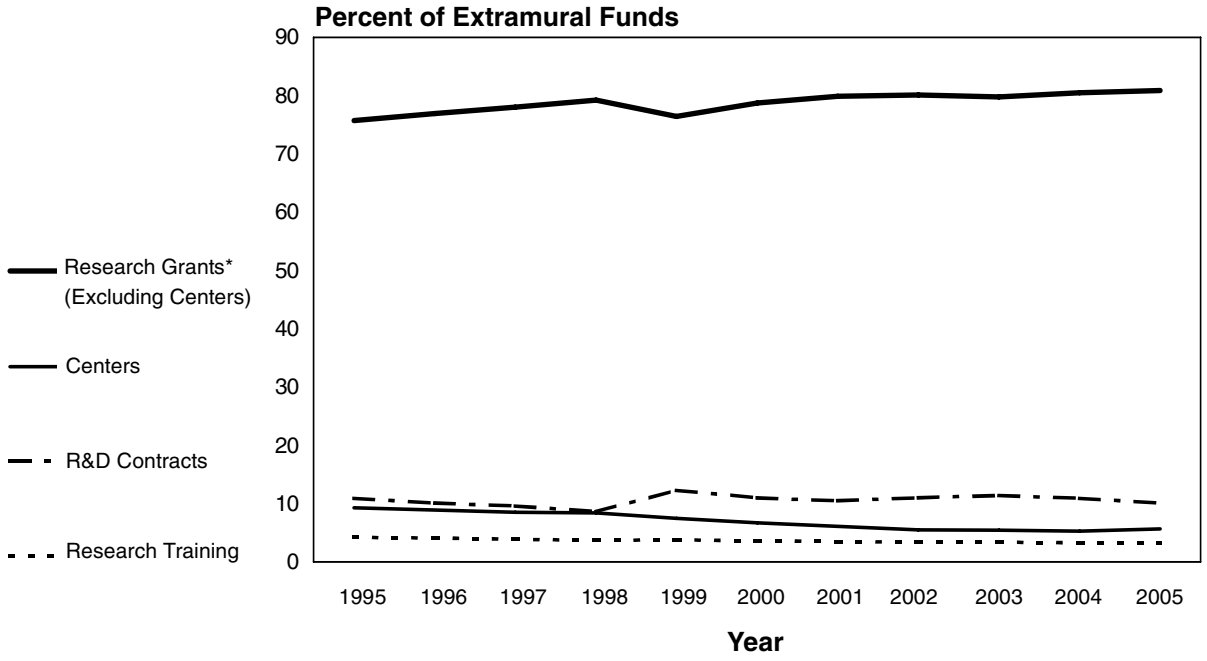
NHLBI Extramural Research Funding Mechanism: Fiscal Years 1995–2005

Dollars (Millions)

	Fiscal Year										
Funding Mechanism	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Research Grants*	$ 875.7	$ 918.7	$ 992.3	$1,075.4	$1,226.7	$1,446.7	$1,669.8	$1,878.0	$2,033.4	$2,116.6	$2,158.8
Centers	107.0	106.7	108.7	114.4	119.9	123.8	127.2	128.2	138.9	140.6	151.5
R&D Contracts	125.9	120.9	121.9	116.7	197.2	201.3	220.1	258.3	290.5	285.5	268.6
Research Training	48.0	48.5	49.8	50.6	60.8	65.4	73.7	79.2	85.8	87.1	88.4
Total, Extramural	**$1,156.6**	**$1,194.8**	**$1,272.7**	**$1,357.1**	**$1,604.6**	**$1,837.2**	**$2,090.8**	**$2,343.7**	**$2,548.6**	**$2,629.8**	**$2,667.3**

* Includes Research Career Programs; does not include Centers.

NHLBI Extramural Research Funding Mechanism: Fiscal Years 1995–2005



NHLBI Extramural Research Funding Mechanism: Fiscal Years 1995–2005

Percent of Total Extramural Budget

	Fiscal Year										
Funding Mechanism	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Research Grants*	75.7%	76.9%	78.0%	79.2%	76.4%	78.7%	79.9%	80.1%	79.8%	80.5%	80.9%
Centers	9.3	8.9	8.5	8.4	7.5	6.7	6.1	5.5	5.5	5.3	5.7
R&D Contracts	10.9	10.1	9.6	8.6	12.3	11.0	10.5	11.0	11.4	10.9	10.1
Research Training	4.2	4.1	3.9	3.7	3.8	3.6	3.5	3.4	3.4	3.3	3.3
Total, Extramural	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

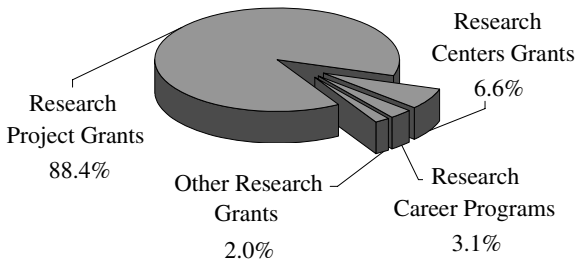
* Includes Research Career Programs; does not include Centers.
Note: Numbers may not add to total due to rounding.

9. Research Grants

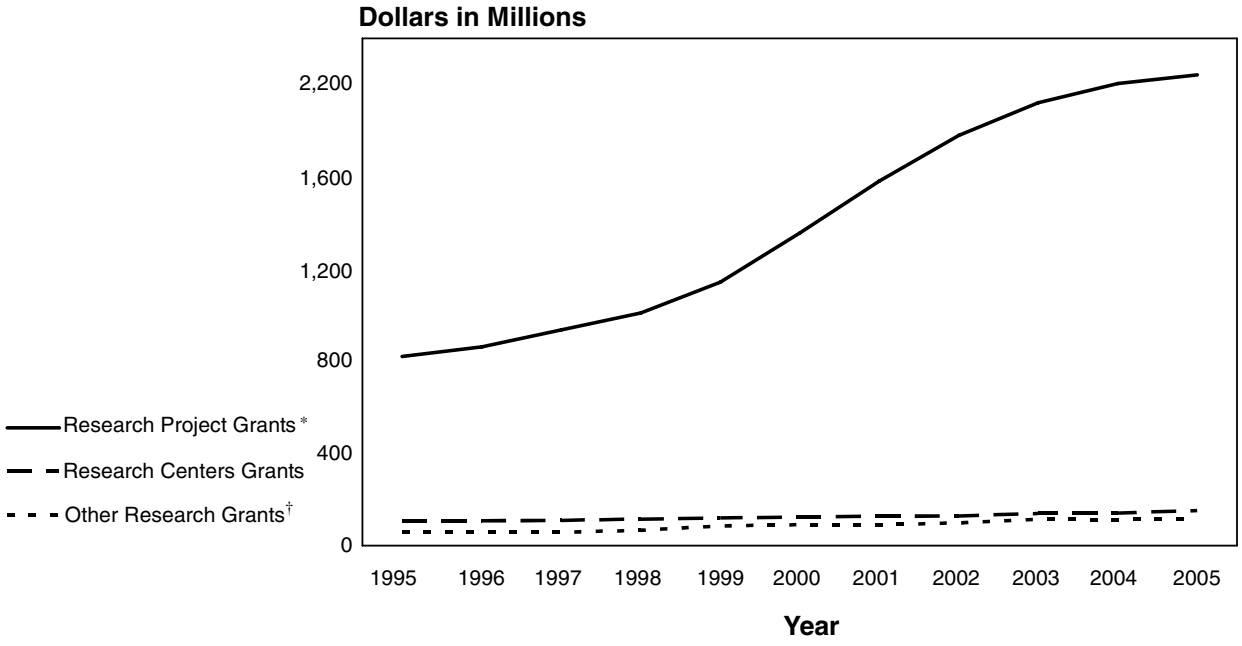
NHLBI Research Grants by Funding Mechanism: Fiscal Year 2005

	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)	3,376	1,328,733	57.51%
Small Research Grants (R03)	1	73	0.00
Program Project Grants (P01)	195	380,358	16.46
Cooperative Agreements (U01)	221	203,546	8.81
Area Grants (R15)	21	4,201	0.18
Explorative Developmental Grant (R21)	107	20,232	0.88
Method to Extend Research in Time (R37)	77	30,667	1.33
Subtotal, Research Project Grants (Excluding Small Business RPGs)	3,998	1,967,810	85.17
Small Business Research Project Grants			
Small Business Technology Transfer (STTR Phase I) (R41)	25	4,212	0.18
Small Business Technology Transfer (STTR Phase II) (R42)	13	5,291	0.23
Small Business Innovation Research (SBIR Phase I) (R43)	90	14,017	0.61
Small Business Innovation Research (SBIR Phase II) (R44)	104	50,220	2.17
Small Business Innovation Research (SBIR) Cooperative Agreements (U44)	—	500	0.02
Subtotal, Small Business Research Project Grants	232	74,240	3.19
Subtotal, Research Project Grants	4,230	2,042,050	88.37
Research Center Grants			
Specialized Centers of Research (SCOR)	52	115,730	5.01
Animal Model and Animal and Biological Material Resource Grants (P40)	—	125	0.01
Sickle Cell Centers (U54)	12	24,314	1.05
Center for AIDS Research (P30)	—	2,815	0.12
Specialized Centers (Cooperative Agreements) (U54)	5	8,186	0.35
National Swine Research and Resource Center (U42)	—	325	0.01
Subtotal, Research Center Grants	69	151,495	6.56
Research Career Programs			
Mentored Research Development Award for Minority Faculty (K01)	45	6,088	0.26
Minority Institution Faculty Mentored Research Scientist Award (K01)	4	588	0.03
Mentored Scientist Development Award in Research Ethics (K01)	3	355	0.02
Independent Scientist Award (K02)	32	3,218	0.14
Research Career Award (K06)	1	34	0.00
Cultural Competence and Health Disparities Academic Award (K07)	14	1,620	0.07
Clinical Investigator Scientist Award (K08)	239	30,429	1.32
Career Enhancement Award for Stem Cell Research (K18)	3	512	0.02
Mentored Patient-Oriented Research Career Development Award (K23)	127	17,086	0.74
Midcareer Investigator Award in Patient-Oriented Research (K24)	32	3,929	0.17
Mentored Quantitative Research Career Development Award (K25)	17	2,206	0.10
Clinical Research Curriculum Award (K30)	—	4,589	0.20
Career Transition Award (K22)	2	364	0.02
Subtotal, Research Career Programs	519	71,018	3.08
Other Research Grants			
Cooperative Clinical Research (U10, R10)	38	26,295	1.14
Minority Biomedical Research Support (S06, S14, R25)	—	2,846	0.12
Other (R09, R13, R18, R24, R25, T15, U09, U24, UH1)	98	16,554	0.72
Subtotal, Other Research Grants	136	45,695	1.98
Total, NHLBI Research Grants	**4,954**	**$2,310,258**	**100%**

NHLBI Total Research Grants by Category



NHLBI Research Project Grant,* Research Centers Grant, and Other Research Grant Obligations: Fiscal Years 1995–2005



NHLBI Research Project Grant,* Research Centers Grant, and Other Research Grant Obligations: Fiscal Years 1995–2005

Dollars (Thousands)

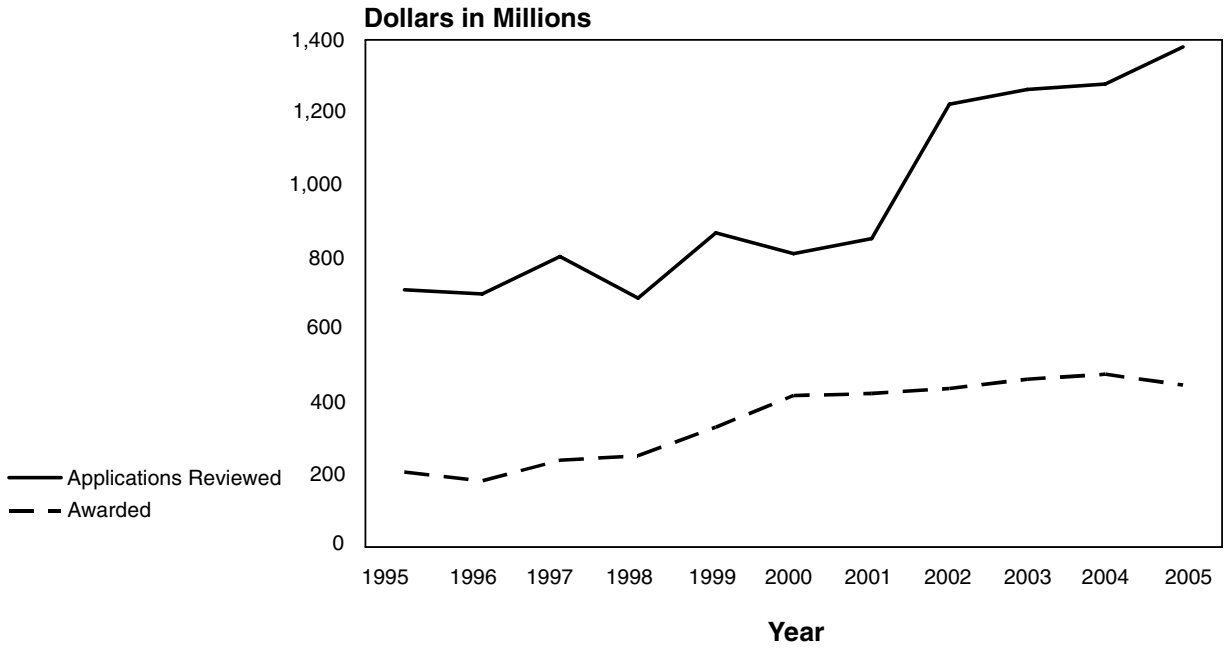
	Fiscal Year										
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Research Project Grants*	$ 819,674	$ 862,027	$ 935,322	$1,009,152	$1,142,473	$1,356,034	$1,580,751	$1,779,573	$1,920,201	$2,003,769	$2,042,050
Research Centers Grants	106,980	106,688	108,665	114,397	119,889	123,803	127,232	128,161	138,941	140,600	151,495
Other Research Grants†	55,974	56,692	56,993	66,234	84,219	90,666	88,958	98,460	113,172	112,785	116,713
Total	**$ 982,628**	**$1,025,407‡**	**$1,100,980**	**$1,189,783**	**$1,346,581**	**$1,570,503**	**$1,796,941**	**$2,006,194**	**$2,172,314**	**$2,257,154**	**$2,310,258**

* Includes R01, R03, U01, P01, R37, R41, R43, and R44; R29 in 1994–2002; R55 in 1995–1996; R15 and R42 beginning in 1996; R21 beginning in 1997; and R33 beginning in 2001.

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

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

NHLBI Competing Research Project Grant Applications*: Fiscal Years 1995–2005
Total Cost Dollars Reviewed and Awarded



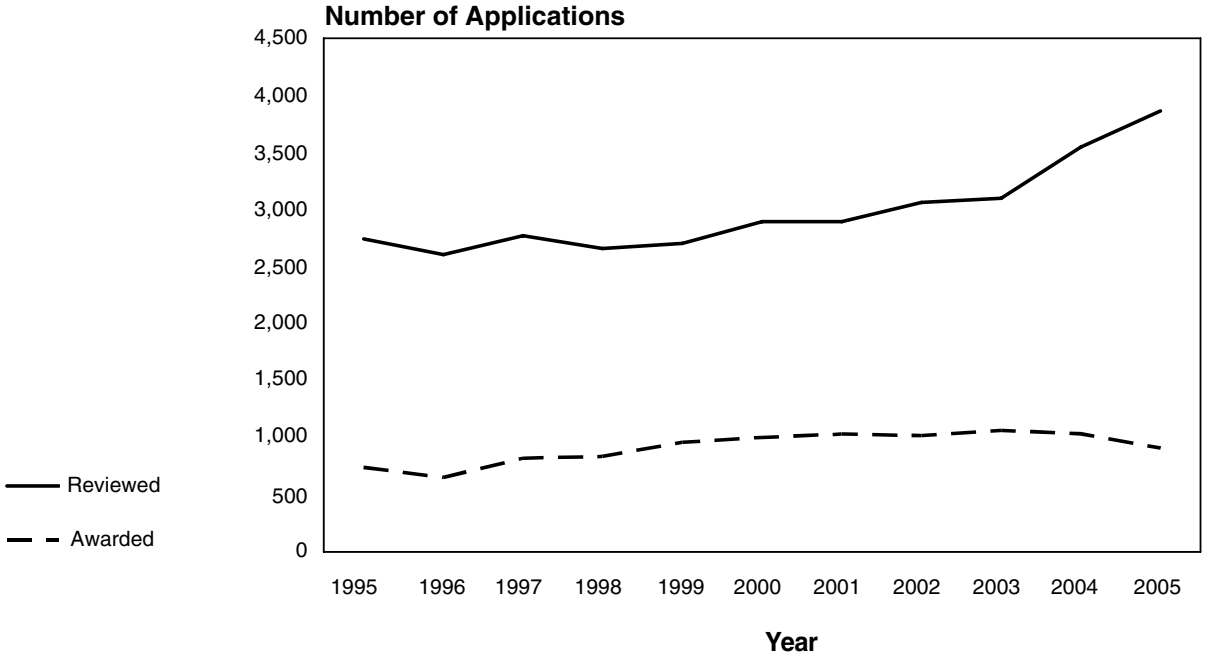
NHLBI Competing Research Project Grant Applications*: Fiscal Years 1995–2005
Total Cost Dollars Reviewed and Awarded

	Dollars (Millions)										
	Fiscal Year										
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005†**
Applications Reviewed	$710.3	$699.2	$802.1	$687.1	$867.1	$809.8	$851.7	$1,221.7	$1,262.5	$1,277.6	$1,381.0
Awarded	207.5	182.1	240.1	252.4	330.4	418.4	424.3	437.4	463.7	477.3	447.8

* Includes R01, R03, U01, P01, and R37; R29 in 1994–2002; R55 in 1995–1996; R15 beginning in 1996; R21 beginning in 1997; and R33 beginning in 2001.
† The number for applications reviewed is based on preliminary data.

NHLBI Competing Research Project Grant Applications*: Fiscal Years 1995–2005

Number Reviewed and Awarded

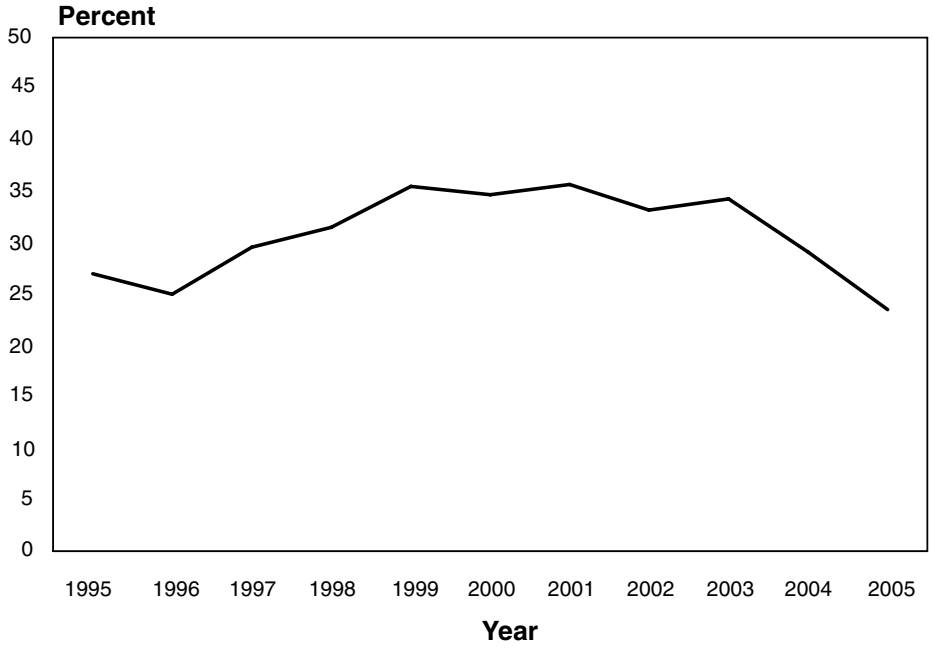


Number Reviewed and Awarded and Percent Funded

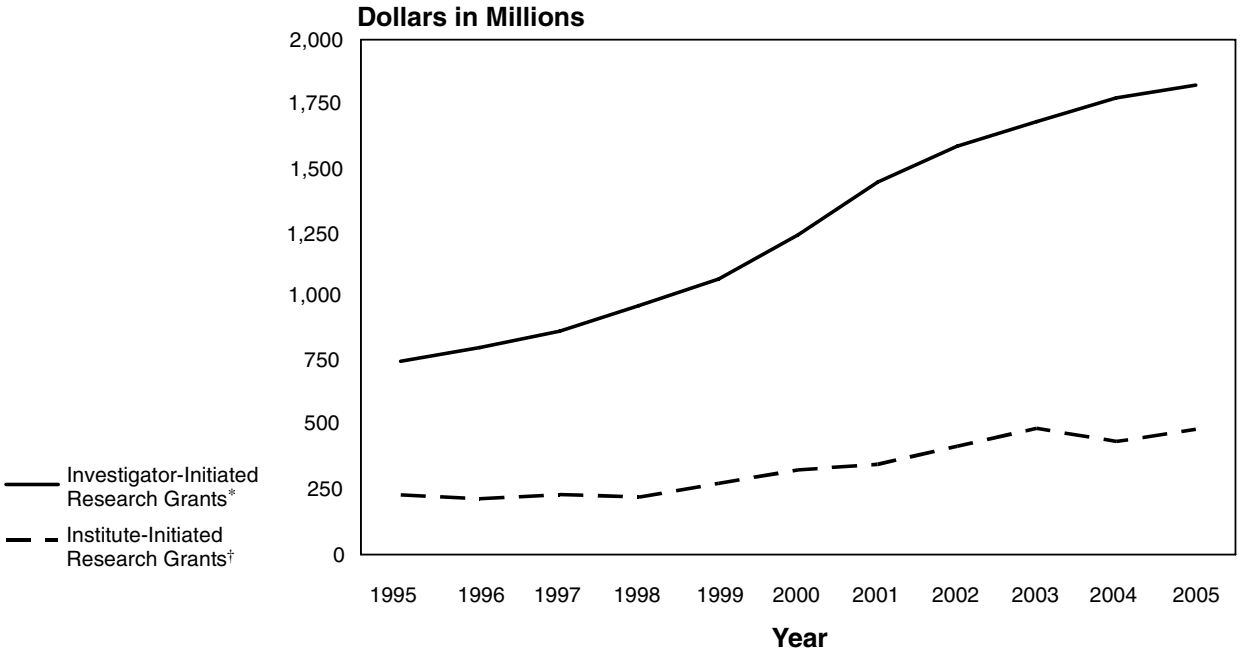
	Fiscal Year										
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005†**
Applications Reviewed	2,744	2,605	2,771	2,657	2,704	2,893	2,895	3,064	3,098	3,548	3,865
RPGs Awarded	740	652	821	837	959	1,003	1,033	1,018	1,064	1,034	909
Success Rate (percent)	27.0	25.0	29.6	31.5	35.5	34.7	35.7	33.2	34.3	29.1	23.5

* Includes R01, R03, U01, P01, and R37; R29 in 1994–2002; R55 in 1995–1996; R15 beginning in 1996; R21 beginning in 1997; and R33 beginning in 2001.
† The number of applications reviewed is based on preliminary data.

Percent of Reviewed Applications Funded (Success Rate)



NHLBI Investigator-Initiated and Institute-Initiated Grant Obligations: Fiscal Years 1995–2005



NHLBI Investigator-Initiated and Institute-Initiated Grant Obligations: Fiscal Years 1995–2005

Dollars (Millions)

	Fiscal Year										
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Investigator-Initiated*	$750.7	$ 804.1	$ 867.9	$ 966.6	$1,069.9	$1,241.6	$1,446.2	$1,584.9	$1,681.9	$1,773.4	$1,822.9
Institute-Initiated†	231.9	216.8	233.0	223.2	276.7	328.9	350.7	421.3	490.4	483.8	487.3
Total	**$982.6**	**$1,020.9‡**	**$1,100.9**	**$1,189.8**	**$1,346.6**	**$1,570.5**	**$1,796.9**	**$2,006.2**	**$2,172.3**	**$2,257.2**	**$2,310.2**

* Includes R01, R03, U01, P01, R37, R41, R43, and R44; R29 in 1994–2002; R55 in 1995–1996; R15 and R42 beginning in 1996; R21 beginning in 1997; and R33 beginning in 2001.

† Includes Centers Grants and Cooperative Agreement RFAs.

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

NHLBI Research Project Grants*: Amount Funded by Type of Award, Fiscal Years 1995–2005

Dollars (Millions)

	Fiscal Year										
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Competing											
New Competing	$111.1	$ 90.5	$135.8	$147.5	$ 202.0	$ 266.4	$ 280.0	$ 291.2	$285.5	$290.5	$270.0
Renewal Competing	94.5	90.4	104.0	103.9	127.2	152.0	143.9	143.9	177.2	185.5	176.1
Competing Supplements	1.9	1.2	0.3	1.0	1.2	0.9	0.4	2.3	1.0	1.3	1.7
Subtotal, Competing	207.5	182.1	240.1	252.4	330.4	419.3	424.3	437.4	463.7	477.3	447.8
Noncompeting											
Subtotal, Noncompeting	588.4	649.9	662.4	721.3	770.6	889.3	1,101.5	1,281.3	1,390.3	1,454.9	1,520.0
Total, Competing and Noncompeting	**$795.9**	**$832.0**	**$902.5**	**$973.7**	**$1,101.0**	**$1,308.6**	**$1,525.8**	**$1,718.7**	**$1,854.0**	**$1,932.2**	**$1,967.8**

* Includes R01, R03, U01, P01, and R37; R29 in 1994–2002; R55 in 1995–1996; R15 beginning in 1996; R21 beginning in 1997; and R33 beginning in 2001.

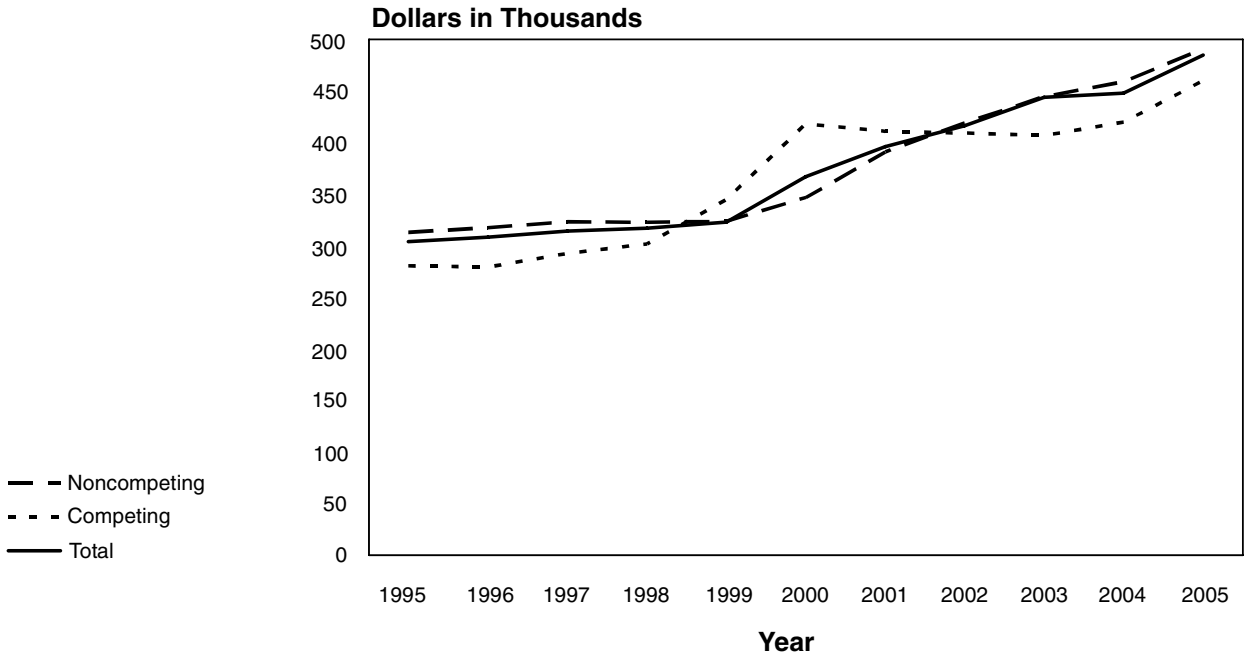
Facility and Administrative (F&A)* Costs of NHLBI Research Project Grants†: Fiscal Years 1995–2005

Dollars (Thousands)

Fiscal Year	Direct Cost	F&A Cost†	Total Cost	F&A Cost as a Percent of Direct Cost
1995	$ 543,502	$ 252,423	$ 795,925	46.4 %
1996	564,219	267,785	832,004	47.5
1997	611,576	290,915	902,491	47.6
1998	660,009	313,765	973,774	47.5
1999	764,198	336,756‡	1,100,954	44.1
2000	891,244	417,312	1,308,556	46.8
2001	1,045,144	480,673	1,525,817	46.0
2002	1,182,408	536,324	1,718,732	45.4
2003	1,276,819	577,131	1,853,950	45.2
2004	1,329,106	603,133	1,932,239	45.4
2005	1,355,803	612,007	1,967,810	45.1

* Previously called Indirect Cost.
† Includes R01, R03, U01, P01, and R37; R29 in 1994–2002; R55 in 1995–1996; R15 beginning in 1996; R21 beginning in 1997; and R33 beginning in 2001.
‡ Excludes Program Evaluation Assessment of $1,216,000.

NHLBI Research Project Grants*: Average Costs, Fiscal Years 1995–2005



NHLBI Research Project Grants*: Average Costs, Fiscal Years 1995–2005

Dollars (Thousands)

	Fiscal Year										
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Noncompeting	$312.8	$317.5	$323.0	$322.6	$323.4	$346.6	$390.7	$418.8	$444.4	$458.7	$490.6
Competing	280.4	279.3	292.5	301.6	344.5	418.0	410.8	409.1	406.7	419.7	459.9
Total	**$303.7**	**$308.3**	**$314.2**	**$316.9**	**$329.4**	**$366.6**	**$396.1**	**$416.2**	**$433.8**	**$447.9**	**$484.8**

* Includes R01, R03, U01, P01, R37, R41, R43, and R44; R29 in 1994–2002; R55 in 1995–1996; R15 and R42 beginning in 1996; R21 beginning in 1997; and R33 beginning in 2001.

NHLBI Cooperative Agreements (U01, U10) Programs

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

	Total Obligations Prior to FY 2005	Total FY 2005 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
AIM HIGH: Niacin Plus Statin To Prevent Vascular Events	$ —	$ 663,376	$ 663,376
Atherosclerosis, Plaque, and CVD in Communities	4,099,685	5,145,549	9,245,234
Bypass Angioplasty Revascularization Investigation in Type 2 Diabetics (BARI 2D)	35,553,973	8,304,235	43,858,208
Cardiovascular Heart Study (CHS) Events Follow-up Study	—	1,007,645	1,007,645
Cardiovascular Outcomes in Renal Atherosclerotic Lesions (CORAL)	4,343,389	5,610,035	9,953,424
Center for Fetal Monkey Gene Transfer for Heart, Lung, and Blood Diseases	2,827,101	596,406	3,423,507
Claudication Exercise vs. Edoluminal Revascularization	—	1,368,413	1,368,413
Coronary Revascularization in Diabetic Patients	3,663,095	4,669,362	8,332,457
Dynamic Evaluation of Percutaneous Coronary Intervention	4,714,221	741,144	5,455,365
Family Blood Pressure Program	84,838,159	3,655,901	88,494,060
Genetics of Coronary Artery Disease in Alaska Natives (GOCADAN)	7,871,675	1,920,380	9,792,055
Girls Health Enrichment Multisite Studies (GEMS)	15,098,492	2,369,517	17,468,009
Heart Failure: A Controlled Trial Investigating Outcomes of Exercise Training (HF-ACTION)	25,044,553	4,483,140	29,527,693
Home Automatic External Defibrillator Trial (HAT)	13,263,642	1,800,742	15,064,384
IMMEDIATE Trial: Immediate Myocardial Metabolic Enhancement During Initial Assessment and Treatment in Emergency Care	5,170,411	9,513,736	14,684,147
Interaction of Genes and Environment in Shaping Risk Factors for Heart, Lung, Blood, and Sleep Disorders	35,525,298	10,547,590	46,072,888
Multidisciplinary Study of Right Ventricular Dysplasia	6,252,319	1,195,224	7,447,543
NHLBI Clinical Proteomics Program	—	5,103,660	5,103,660
Partnership Programs To Reduce Cardiovascular Health Disparities	6,468,544	7,202,208	13,670,752
Pediatric Cardiovascular Clinical Research Network	18,598,211	3,992,212	22,590,423
Pharmacogenetics Research Network	33,206,897	6,334,303	39,541,200
Preventing Overweight Using Novel Dietary Strategies (POUNDS LOST)	2,899,312	2,017,478	4,916,790
Primordial Prevention of Overweight in American Indian Children	—	354,427	354,427
Programs of Excellence in Gene Therapy	61,140,050	10,803,812	71,943,862
Programs of Excellence in Nanotechnology	—	6,322,873	6,322,873
Programs of Genomic Applications (PGAs) for Heart, Lung, and Blood Diseases	165,782,192	14,858,305	180,640,497
Resuscitation Outcome Improvement Consortium	6,886,109	9,338,606	16,224,715
Stop Atherosclerosis in Native Diabetics Study (SANDS)	6,681,337	2,323,642	9,004,979
Strong Heart Study	46,438,304	5,300,000	51,738,304
Surgical Treatment for Ischemic Heart Failure (STICH)	13,864,647	6,082,190	19,946,837
Trial of Activity for Adolescent Girls (TAAG)	28,202,937	5,102,829	33,305,766
Weight Loss Maintenance (WLM)	8,054,488	3,098,894	11,153,382
Women's Ischemia Syndrome Evaluation (WISE)	5,617,360	995,753	6,613,113
Subtotal, Heart and Vascular Diseases	652,106,401	152,823,587	804,929,988
Lung Diseases			
Asthma Clinical Research Network (ACRN), Phase II	16,605,558	8,667,026	25,272,584
Centers for Reducing Asthma Disparities	17,269,191	5,135,604	22,404,795
Childhood Asthma Management Program–Continuation Study (CAMP–CS)/Phase 2	3,532,802	2,622,721	6,155,523
Childhood Asthma Research and Education (CARE) Network	31,398,337	5,704,202	37,102,539
Collaborative Program in Bronchopulmonary Dysplasia	26,302,593	5,353,412	31,656,005
COPD Clinical Research Network	13,691,750	8,437,795	22,129,545
Early Antipseudomonal Therapy in Cystic Fibrosis	1,064,237	1,047,381	2,111,618

	Total Obligations Prior to FY 2005	Total FY 2005 Obligations	Total Obligations to Date
Idiopathic Pulmonary Fibrosis Clinical Research Network	—	3,486,226	3,486,226
Pharmacogenetics of Asthma Treatment	10,847,376	3,361,644	14,209,020
Prospective Investigation of Pulmonary Embolism Diagnosis-III (PIOPED III)	—	2,301,770	2,301,770
Subtotal, Lung Diseases	120,711,844	46,117,781	166,829,625
Blood Diseases and Resources			
Blood and Marrow Transplant Clinical Research Network	23,181,808	6,459,743	29,641,551
Center for Human Cell Therapy	2,837,171	2,352,572	5,179,743
Functional Outcomes in Cardiovascular Patients Undergoing Surgical Hip Fracture Repair (FOCUS)	3,435,202	2,922,730	6,357,932
Stroke With Transfusions Changing to Hydroxyurea (SWITCH)	—	3,345,345	3,345,345
Thalassemia (Cooley's Anemia) Clinical Research Network	11,374,688	2,729,989	14,104,677
Transfusion Medicine/Hemostasis Clinical Research Network	18,386,476	6,221,140	24,607,616
Subtotal, Blood Diseases and Resources	59,215,345	24,031,519	83,236,864
National Center on Sleep Disorders Research			
Apnea Positive Pressure Long-Term Efficacy Study (APPLES)	9,354,009	3,188,172	12,542,181
Sleep Heart Health Study	18,109,357	1,494,336	19,603,693
Subtotal, National Center on Sleep Disorders Research	27,463,366	4,682,508	32,145,874
Total, NHLBI Cooperative Agreements	**$859,496,956**	**$227,655,395**	**$1,087,142,351**

Heart and Vascular Diseases Program

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

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

Obligations

Funding History:
Fiscal Year 2005—$663,376
Total Funding to Date—$663,376

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 coronary heart disease and stroke.

Obligations

Funding History:
Fiscal Year 2005—$5,145,549
Fiscal Year 2004—$4,099,685
Total Funding to Date—$9,245,234

Current Active Organization and Grant Number

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

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

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

Obligations

Funding History:
Fiscal Year 2005—$8,304,235
Fiscal Years 2000–2004—$35,553,973
Total Funding to Date—$43,854,208

Current Active Organizations and Grant Numbers

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

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

The purpose of this project is to enhance the use of data and samples from the CHS during a transition period from the current contract-funded, NHLBI-directed program to one directed by a steering committee of investigators with independently acquired grants. During the follow-up, many of the initial exam components will be repeated and CVD events will be recorded. The data and specimens collected in CHS represent a major national resource for the study of health, aging, and CVD in older adults. Seventeen percent of the participants are from minority populations.

Obligations

Funding History:
Fiscal Year 2005—$1,007,645
Total Funding to Date—$1,007,645

Current Active Organization and Grant Number

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

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

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

Obligations

Funding History:
Fiscal Year 2005—$5,610,035
Fiscal Year 2004—$4,343,389
Total Funding to Date—$9,953,424

Current Active Organizations and Grant Numbers

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

Center for Fetal Monkey Gene Transfer for Heart, Lung, and Blood Diseases, Initiated in Fiscal Year 2001

The purpose of this Center is to provide expertise, sources, and resources to NHLBI-supported investigators who wish to evaluate viral and nonviral gene transfer strategies in nonhuman primates.

Obligations

Funding History:
Fiscal Year 2005—$596,406
Fiscal Years 2001–2004—$2,827,101
Total Funding to Date—$3,423,507

Current Active Organization and Grant Number

1. University of California, Davis
Davis, California —HL-069748

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 2005—$1,368,413
Total Funding to Date—$1,368,413

Current Active Organizations and Grant Numbers

1. Rhode Island Hospital
Providence, Rhode Island —HL-077221
2. Brigham and Women's Hospital
Boston, Massachusetts —HL-081658

Coronary Revascularization in Diabetic Patients, Initiated in Fiscal Year 2004

The purpose of this clinical trial is to compare a multivessel stenting strategy using the Sirolimus-eluting stents with CABG in diabetic patients with multivessel disease. The primary outcome is the difference in mortality rates between the stent group and the CABG group during a 5-year period.

Obligations

Funding History:
Fiscal Year 2005—$4,669,362
Fiscal Year 2004—$3,663,095
Total Funding to Date—$8,332,457

Current Active Organization and Grant Number

1. Mount Sinai School of Medicine
New York, New York —HL-071988

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 2005—$741,144
Fiscal Years 1997–2004—$4,714,221
Total Funding to Date—$5,455,365

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 2005—$3,655,901
Fiscal Years 1995–2004—$84,838,159
Total Funding to Date—$88,494,060

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. Staub Pacific Health Foundation
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 2005—$1,920,380
Fiscal Years 2000–2004—$7,871,675
Total Funding to Date—$9,792,055

Current Active Organizations and Grant Numbers

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

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

The objective of this project is to develop and test interventions to prevent obesity by decreasing weight gain during the high-risk transitional period from prepuberty to puberty in black girls who are at risk for developing obesity. Phase 1 (developmental and pilot studies) was completed in FY 2002. Two sites began Phase 2 trials in FY 2003.

Obligations

Funding History:
Fiscal Year 2005—$2,369,517
Fiscal Years 1999–2004—$15,098,492
Total Funding to Date—$17,468,009

Current Active Organizations and Grant Numbers

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

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

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

Obligations

Funding History:
Fiscal Year 2005—$4,483,140
Fiscal Years 2002–2004—$25,044,553
Total Funding to Date—$29,527,693

Current Active Organizations and Grant Numbers

1. Duke University
   Durham, North Carolina —HL-063747
2. Case Western Reserve University
   Henry Ford Health System
   Detroit, Michigan —HL-064250
3. Oregon Health & Science University
   Portland, Oregon —HL-064257
4. Washington University
   St. Louis, Missouri —HL-064264
5. University of Colorado
   Health Sciences Center
   Denver, Colorado —HL-064265
6. Duke University
   Durham, North Carolina —HL-066461
7. Emory University
   Atlanta, Georgia —HL-066482
8. Wake Forest University
   Winston-Salem, North Carolina —HL-066491
9. Ohio State University
   Columbus, Ohio —HL-066494
10. University of Alabama at Birmingham
    Birmingham, Alabama —HL-066497
11. Case Western Reserve University
    Cleveland, Ohio —HL-066501
12. Boston Medical Center
    Boston, Massachusetts —HL-068973
13. University of California, Los Angeles
    Los Angeles, California —HL-068980

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 2005—$1,800,742
Fiscal Years 2002–2004—$13,263,642
Total Funding to Date—$15,064,384

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 acute MI 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 2005—$9,513,736
Fiscal Year 2004—$5,170,411
Total Funding to Date—$14,684,147

Current Active Organizations and Grant Numbers

1. New England Medical Center Hospitals
   Boston, Massachusetts —HL-077821
2. New England Medical Center Hospitals
   Boston, Massachusetts —HL-077822
3. New England Medical Center Hospitals
   Boston, Massachusetts —HL-077823
4. New England Medical Center Hospitals
   Boston, Massachusetts —HL-077826

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

The purpose of this study is to identify novel genes that interact with specific environmental exposures to modify risk factors for heart, lung, and blood diseases and sleep disorders. The genetic aspects of response to environmental change and related biological mechanisms will be studied using short-term, focused interventions in families. Subgroups will be identified based on genotypes that are most likely to benefit from targeted environmental changes designed to reduce the development or progression of heart, lung, and blood diseases or sleep disorders.

Obligations

Funding History:
Fiscal Year 2005—$10,547,590
Fiscal Years 2002–2004—$35,525,298
Total Funding to Date—$46,072,888

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. Johns Hopkins University
Baltimore, Maryland —HL-072518
4. University of Minnesota, Twin Cities
Minneapolis, Minnesota —HL-072524
5. University of Maryland Baltimore Professional School
Baltimore, Maryland —HL-072525

Multidisciplinary Study of Right Ventricular Dysplasia, Initiated in Fiscal Year 2001

The purpose of this multidisciplinary, multicenter study is to investigate the cardiac, clinical, and genetic aspects of arrhythmogenic right ventricular dysplasia (ARVD). A North American ARVD registry of patients and their families will be established. Researchers seek to identify chromosomal loci and specific genetic mutations associated with this disorder.

Obligations

Funding History:
Fiscal Year 2005—$1,195,224
Fiscal Years 2001–2004—$6,252,319
Total Funding to Date—$7,447,543

Current Active Organizations and Grant Numbers

1. University of Arizona
Tucson, Arizona —HL-065594
2. Baylor College of Medicine
Houston, Texas —HL-065652
3. University of Rochester
Rochester, New York —HL-065691

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 2005—$5,103,660
Total Funding to Date—$5,103,660

Current Active Organizations and Grant Numbers

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

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

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

Obligations

Funding History:
Fiscal Year 2005—$7,202,208
Fiscal Year 2004—$6,468,544
Total Funding to Date—$13,670,752

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)
   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 Cardiovascular Clinical Research Network, Initiated in Fiscal Year 2001

See Chapter 11. Clinical Trials.

Pharmacogenetics Research Network, Initiated in Fiscal Year 2001

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

Obligations

Funding History:
Fiscal Year 2005—$6,334,303
Fiscal Years 2001–2004—$33,206,897
Total Funding to Date—$39,541,200

Current Active Organizations and Grant Numbers

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

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

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

Obligations

Funding History:
Fiscal Year 2005—$2,017,478
Fiscal Years 2003–2004—$2,899,312
Total Funding to Date—$4,916,790

Current Active Organization and Grant Number

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

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

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

Obligations

Funding History:
Fiscal Year 2005—$354,427
Total Funding to Date—$354,427

Current Active Organization and Grant Number

1. Kaiser Foundation Research Institutes
Oakland, California —HL-081624

Programs of Excellence in Gene Therapy, Initiated in Fiscal Year 2000

The objective of these programs is to create an environment that will enable rapid translation of preclinical studies in cardiovascular, pulmonary, and hematologic diseases into human pilot experiments. In addition, the programs are offering training at the interface between basic science and clinical application. Six national cores provide access to specialized services, such as generating vectors for clinical use, performing morphologically based studies, producing and processing hematopoietic stem cells, and performing primate transplantation studies.

Obligations

Funding History:
Fiscal Year 2005—$10,803,812
Fiscal Years 2000–2004—$61,140,050
Total Funding to Date—$71,943,862

Current Active Organizations and Grant Numbers

1. University of Washington
Seattle, Washington —HL-066947
2. Stanford University
Stanford, California —HL-066948
3. University of Pittsburgh
Pittsburgh, Pennsylvania —HL-066949
4. Weill Medical College
of Cornell University
New York, New York —HL-066952
5. Weill Medical College
of Cornell University
New York, New York —HL-067738

Programs of Excellence in Nanotechnology, Initiated in Fiscal Year 2005

The purpose of this program is to establish multidisciplinary teams to develp nanotechnology and biomolecular engineering tools and methodologies to detect and analyze atherosclerotic plaque formation. The program presents an unique opportunity for research collaboration and skills training by bring bioengineering and nanotechnology solutions into medicine and vice versa.

Obligations

Funding History:
Fiscal Year 2005—$6,322,873
Total Funding to Date—$6,322,873

Current Active Organization and Grant Number

1. Emory University
Atlanta, Georgia —HL-080711

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 2005—$14,858,305
Fiscal Years 2000–2004—$165,782,192
Total Funding to Date—$180,640,497

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, California —HL-066621
5. University of Washington
Seattle, Washington —HL-066642
6. University of California
Lawrence Berkeley Laboratory
Berkeley, California —HL-066681
7. University of Washington
Seattle, Washington —HL-066682

Resuscitation Outcome Improvement Consortium, Initiated in Fiscal Year 2004

The purpose of this program is to establish a resuscitation research consortium to conduct clinical research in the areas of cardiopulmonary arrest and traumatic injury leading to arrest. The consortium will enable investigators to conduct multiple collaborative trials to expedite

the translation of promising scientific and clinical advances to improve resuscitation outcomes.

Obligations

Funding History:
Fiscal Year 2005—$9,338,606
Fiscal Year 2004—$6,886,109
Total Funding to Date—$16,224,715

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 & 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

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

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

Obligations

Funding History:
Fiscal Year 2005—$2,323,642
Fiscal Years 2002–2004—$6,681,337
Total Funding to Date—$9,004,979

Current Active Organization and Grant Number

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

Strong Heart Study, Initiated in Fiscal Year 1988

The objectives of this study are to survey CVD morbidity and mortality rates among three geographically diverse groups of American Indians and to estimate their levels of CVD risk factors. Phases II and III of the cohort study extended surveillance of community mortality and assessed development of CVD and changes in CVD risk factors. In Phase III, investigators added a substudy of asthma and a pilot family study. The purpose of Phase IV is to enlarge the family study to 120 families comprising 3,600 members to investigate genetic and environmental contributors of CVD.

Obligations

Funding History:
Fiscal Year 2005—$5,300,000
Fiscal Years 1988–2004—$46,438,304
Total Funding to Date—$51,738,304

Current Active Organizations and Grant Numbers

1. MedStar Research Institute
Washington, DC —HL-041642
2. Missouri Breaks Research, Inc.
Timberlake, South Dakota —HL-041652
3. University of Oklahoma
Health Sciences Center
Oklahoma City, Oklahoma —HL-041654
4. Southwest Foundation for
Biomedical Research
San Antonio, Texas —HL-065520
5. Weill Medical College of
Cornell University
New York, New York —HL-065521

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

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

Obligations:

Funding History:
Fiscal Year 2005—$6,082,190
Fiscal Years 2002–2004—$13,864,647
Total Funding to Date—$19,946,837

Current Active Organizations and Grant Numbers

1. Thomas Jefferson University
   Philadelphia, Pennsylvania —HL-069009
2. Mayo Clinic
   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 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 2005—$3,098,894
Fiscal Years 2003–2004—$8,054,488
Total Funding to Date—$11,153,382

Current Active Organizations and Grant Numbers

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

Women's Ischemia Syndrome Evaluation (WISE), Initiated in Fiscal Year 2001

The purpose of this study is to extend the follow-up of WISE patients to determine the incremental long-term prognostic value of novel testing developed in WISE, develop sex-specific incremental outcome models to evaluate the prognostic value of female reproductive variables, and maintain a WISE database and infrastructure to facilitate further investigations into the mechanisms underlying ischemic syndromes in women.

Obligations

Funding History:
Fiscal Year 2005—$995,753
Fiscal Years 2001–2004—$5,617,360
Total Funding to Date—$6,613,113

Current Active Organizations and Grant Numbers

1. University of Pittsburgh
   Pittsburgh, Pennsylvania —HL-064829
2. University of Florida
   Gainesville, Florida —HL-064924

Lung Diseases Program

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

See Chapter 11. Clinical Trials.

Centers for Reducing Asthma Disparities, Initiated in Fiscal Year 2002

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

Obligations

Funding History:
Fiscal Year 2005—$5,135,604
Fiscal Years 2002–2004—$17,269,191
Total Funding to Date—$22,404,795

Current Active Organizations and Grant Numbers

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

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

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

Obligations

Funding History:
Fiscal Year 2005—$2,622,721
Fiscal Years 2003–2004—$3,532,802
Total Funding to Date—$6,155,523

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.

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 2005—$5,353,412
Fiscal Years 1999–2004—$26,302,593
Total Funding to Date—$31,656,005

Current Active Organizations and Grant Numbers

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

9. Children's Hospital of Philadelphia
Philadelphia, Pennsylvania —HL-075900
10. Children's Hospital
Boston, Massachusetts —HL-075904

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 2005—$1,047,381
Fiscal Year 2004—$1,064,237
Total Funding to Date—$2,111,618

Current Active Organization and Grant Number

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

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

See Chapter 11. Clinical Trials.

Pharmacogenetics of Asthma Treatment, Initiated in Fiscal Year 2000

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

Obligations

Funding History:
Fiscal Year 2005—$3,361,644
Fiscal Years 2000–2004—$10,847,376
Total Funding to Date—$14,209,020

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 2005—$2,301,770
Total Funding to Date—$2,301,770

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, D.C. —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

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 2005—$2,352,572
Fiscal Year 2004—$2,827,171
Total Funding to Date—$5,179,743

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 2005—$2,922,730
Fiscal Years 2003–2004—$3,435,202
Total Funding to Date—$6,357,932

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

Genotypic Determinants of Aspirin Response in High Risk Families, Initiated in Fiscal Year 2002

The purpose of this study is to identify genes that may modify aspirin's effect on platelet function and inflammatory biomarker levels in families at increased risk for premature coronary artery disease.

Obligations

Funding History:
Fiscal Year 2005—$3,307,112
Fiscal Years 2002–2004—$8,751,227
Total Funding to Date—$12,058,339

Current Active Organization and Grant Number

1. Johns Hopkins University
Baltimore, Maryland —HL-072518

Stroke With Transfusions Changing to Hydroxyurea, 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 2005—$3,345,345
Total Funding to Date—$3,345,345

Current Active Organizations and Grant Numbers

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

Thalassemia (Cooley's Anemia) Clinical Research Network

See Chapter 11. Clinical Trials.

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

See Chapter 11. Clinical Trials.

National Center on Sleep Disorders Research

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

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

Obligations

Funding History:
Fiscal Year 2005—$3,188,172
Fiscal Years 2002–2004—$9,354,009
Total Funding to Date—$12,542,181

Current Active Organization and Grant Number

1. Stanford University
   Stanford, California —HL-068060

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 2005—$1,494,336
Fiscal Years 1999–2004—$18,109,357
Total Funding to Date—$19,603,693

Current Active Organizations and Grant Numbers

1. University of California, Davis
   Davis, California —HL-053916
2. New York University Medical Center
   New York, New York —HL-053931
3. University of Minnesota, Twin Cities
   Minneapolis, Minnesota —HL-053934
4. Johns Hopkins University
   Baltimore, Maryland —HL-053937
5. University of Arizona
   Tucson, Arizona —HL-053938
6. Boston University
   Boston, Massachusetts —HL-053941
7. Missouri Breaks Research, Inc.
   Timberlake, South Dakota —HL-063429
8. Case Western Reserve University
   Cleveland, Ohio —HL-063463
9. Johns Hopkins University
   Baltimore, Maryland —HL-064360
10. University of Pittsburgh
    Pittsburgh, Pennsylvania —HL-077813

NHLBI Research Centers (P50, U54, P30) Programs

Specialized Centers of Research (P50) and Specialized Centers of Clinically Oriented Research (P50) Programs

The NHLBI initiated the Specialized Centers of Research (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. Listed below is the funding history for the individual SCORs/SCCORs supported by the Institute.

		Obligations (Dollars in Thousands)		
Area of Concentration	**Period of Operation**	**Prior to FY 2005**	**FY 2005**	**Total to Date**
Heart and Vascular Diseases Program				
Cardiac Dysfunction and Disease (SCCOR)	2005–	$ —	$ 16,497	$ 16,497
Molecular Genetics of Hypertension	1996–	82,634	10,285	92,919
Molecular Medicine and Atherosclerosis	1997–	60,235	8,251	68,486
Pediatric Heart Development and Disease (SCCOR)	2004–	13,245	13,283	26,528
Subtotal, Heart and Vascular Diseases Program		156,114	48,316	204,430
Lung Diseases Program				
Airway Biology and Pathogenesis of Cystic Fibrosis	1988–	58,758	3,615	62,373
Cellular and Molecular Mechanisms of Asthma	1996–	102,887	15,501	118,388
Pathobiology of Fibrotic Lung Disease	1997–	39,023	5,428	44,451
Pathobiology of Lung Development	1996–	62,672	7,585	70,257
Translational Research in Acute Lung Injury (SCCOR)	2003–	23,326	12,306	35,632
Subtotal, Lung Diseases Program		286,666	44,435	331,101
Blood Diseases and Resources Program				
Hemostatic and Thrombotic Disorders	1996–	169,832	7,594	177,426
Transfusion Biology and Medicine	1996–	62,095	3,267	65,362
Transfusion Biology and Medicine (SCCOR)	2005–	—	4,400	4,400
Translational Human Stem Cell Research	2005–	—	1,509	1,509
Subtotal, Blood Diseases and Resources Program		231,927	16,770	248,697
National Center on Sleep Disorders Research				
Neurobiology of Sleep and Sleep Apnea	1998–	35,102	6,208	41,310
Subtotal, National Center on Sleep Disorders Research		35,102	6,208	41,310
Total, Specialized Centers of Research (P50)		**$709,809**	**$115,729**	**$825,532**

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 2005—$16,497,136

Current Active Organizations and Grant Numbers

1. Columbia University
   Health Science Center
   New York, New York —HL-077096
2. University of Alabama at Birmingham
   Birmingham, Alabama —HL-077100
3. University of Cincinnati
   Cincinnati, Ohio —HL-077101
4. Cleveland Clinical Lerner College
   Cleveland, Ohio —HL-077107
5. Washington University
   St. Louis, Missouri —HL-077113

Molecular Genetics of Hypertension

The purpose of this SCOR is to elucidate the etiology and pathogenesis of hypertension and to translate the knowledge into improved diagnosis and management of the disease.

Obligations

Fiscal Year 2005—$10,285,182

Current Active Organizations and Grant Numbers

1. Medical College of Wisconsin
   Milwaukee, Wisconsin —HL-054998
2. Brigham and Women's Hospital
   Boston, Massachusetts —HL-055000
3. Boston University Medical Center
   Boston, Massachusetts —HL-055001
4. University of Iowa
   Iowa City, Iowa —HL-055006
5. Yale University
   New Haven, Connecticut —HL-055007

Molecular Medicine and Atherosclerosis

The goal of this SCOR is to advance understanding of the etiology and pathobiology of the atherosclerotic lesion at the molecular level through modern methods and approaches of molecular medicine. Some of the subprojects have a large minority patient population.

Obligations

Fiscal Year 2005—$8,251,334

Current Active Organizations and Grant Numbers

1. Columbia University
   New York, New York —HL-056984
2. Brigham and Women's Hospital
   Boston, Massachusetts —HL-056985
3. University of California, San Diego
   La Jolla, California —HL-056989
4. University of Pennsylvania
   Philadelphia, Pennsylvania —HL-070128

Pediatric Heart Development and Disease

The purpose of this SCCOR is to foster multidisciplinary collaborations so that basic research advances can be translated rapidly to clinical care for children with heart disease. Research focus ranges from the genetic basis of heart valve disease to clinical trials of novel surgical strategies for congenital heart disease repair and immune modulation in pediatric heart transplantation. Two of the centers will have Clinical Research Skills Development Cores to train fellows and junior faculty in clinical research methods.

Obligations

Fiscal Year 2005—$13,282,825

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

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 2005—$3,615,257

Current Active Organizations and Grant Numbers

1. University of North Carolina at Chapel Hill, Chapel Hill, North Carolina —HL-060280
2. University of Iowa, Iowa City, Iowa —HL-061234

Cellular and Molecular Mechanisms of Asthma

The objective of this SCOR is to apply critical science and technology to increase understanding of cellular and molecular mechanisms of asthma, including those mechanisms underlying the biological impact of environmental factors.

Obligations

Fiscal Year 2005—$15,501,156

Current Active Organizations and Grant Numbers

1. University of New Mexico, Albuquerque, New Mexico —HL-056384
2. University of California, San Francisco, San Francisco, California —HL-056385
3. University of Wisconsin, Madison, Wisconsin —HL-056396
4. University of Chicago, Chicago, Illinois —HL-056399
5. Washington University, St. Louis, Missouri —HL-056419
6. University of Pennsylvania, Philadelphia, Pennsylvania —HL-067663
7. Beth Israel Deaconess Medical Center, Boston, Massachusetts —HL-067664
8. University of Arizona, Tucson, Arizona —HL-067672
9. Stanford University, Stanford, California —HL-067674

Pathobiology of Fibrotic Lung Disease

The purpose of this SCOR is to study cellular and molecular mechanisms involved in transition from inflammatory events associated with early fibrotic disease to later processes involving wound healing, repair, and fibrosis.

Obligations

Fiscal Year 2005—$5,427,833

Current Active Organizations and Grant Numbers

1. University of Michigan at Ann Arbor, Ann Arbor, Michigan —HL-056402
2. University of California, Los Angeles, Los Angeles, California —HL-067665
3. National Jewish Center for Immunology and Respiratory Diseases, Denver, Colorado —HL-067671

Pathobiology of Lung Development

The objective of this SCOR is to foster multidisciplinary research enabling basic science findings to be rapidly applied to clinical problems related to lung development. The program focuses on identification of the molecular variables involved in lung development and assessment of the impact of injury during critical periods.

Obligations

Fiscal Year 2005—$7,584,895

Current Active Organizations and Grant Numbers

1. Children's Hospital Medical Center, Cincinnati, Ohio —HL-056387
2. Children's Hospital of Philadelphia, Philadelphia, Pennsylvania —HL-056401
3. University of Colorado Health Sciences Center, Denver, Colorado —HL-057144
4. Children's Hospital, Boston, Massachusetts —HL-067669

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 2005—$12,305,723

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 SCOR is to investigate pathogenic mechanisms involved in human thrombotic disease and to develop improved methods for its diagnosis and treatment. One of the studies has a large minority patient population.

Obligations

Fiscal Year 2005—$7,543,875

Current Active Organizations and Grant Numbers

1. Mount Sinai School of Medicine
   New York, New York —HL-054469
2. University of Pennsylvania
   Philadelphia, Pennsylvania —HL-054500
3. University of Oklahoma
   Oklahoma City, Oklahoma —HL-054502
4. Baylor College of Medicine
   Houston, Texas —HL-065967

Transfusion Biology and Medicine

The purpose of this SCOR is to foster new approaches for improving the availability, efficacy, safety, and quality of blood and blood products for therapeutic uses. One of the centers has a large minority population.

Obligations

Fiscal Year 2005—$3,267,069

Current Active Organizations and Grant Numbers

1. New York Blood Center
   New York, New York —HL-054459
2. University of California, San Francisco
   San Francisco, California —HL-054476

Transfusion Biology and Medicine

The purpose of this SCCOR is to foster multidisciplinary research on clinically relevant questions to enable rapid application of basic science findings to clinical problems associated with improving the availability, efficacy, safety, and quality of blood and blood products for therapeutic uses.

Obligations

Fiscal Year 2005—$4,400,002

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

Translational Human Stem Cell Research

The purpose of this SCCOR 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 hitherto-unexplored 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 2005—$1,509,262

Current Active Organization and Grant Number

1. University of California, Davis
   Davis, California —HL-085036

National Center on Sleep Disorders Research

Neurobiology of Sleep and Sleep Apnea

The objective of this SCOR is to integrate molecular, cellular, and genetic approaches to sleep control with clinical investigations on the etiology and pathogenesis of sleep disorders, particularly sleep apnea.

Obligations

Fiscal Year 2005—$6,208,020

Current Active Organizations and Grant Numbers

1. University of Pennsylvania
   Philadelphia, Pennsylvania —HL-060287
2. Brigham and Women's Hospital
   Boston, Massachusetts —HL-060292
3. University of California, Los Angeles
   Los Angeles, California —HL-060296

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 2005—$24,313,796

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 2005—$6,957,161

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

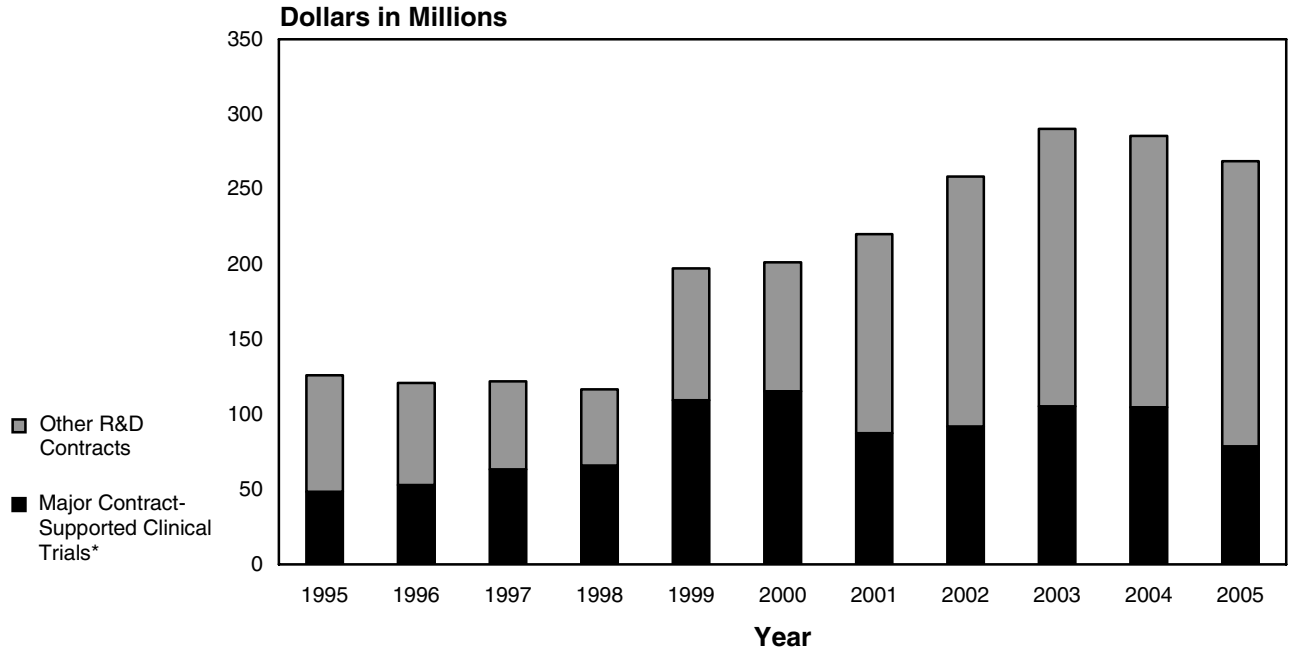
Fiscal Year 2005—$2,829,119

Current Active Organizations and Grant Numbers

1. New York University
   School of Medicine
   New York, New York —AI-27742
2. University of Washington
   Seattle, Washington —AI-27757
3. University of California, San Francisco
   San Francisco, California —AI-27763
4. University of Alabama at Birmingham
   Birmingham, Alabama —AI-27767
5. University of California, Los Angeles
   Los Angeles, California —AI-28697
6. Baylor University
   Houston, Texas —AI-36211
7. University of California, San Diego
   La Jolla, California —AI-36214
8. Case Western Reserve University
   Cleveland, Ohio —AI-36219
9. University of Massachusetts
   Medical School
   Worcester, Massachusetts —AI-42845
10. Miriam Hospital
    Providence, Rhode Island —AI-42853
11. Johns Hopkins University
    Baltimore, Maryland —AI-42855
12. University of Pennsylvania
    Philadelphia, Pennsylvania —AI-45008
13. Emory University
    Atlanta, Georgia —AI-50409
14. University of North Carolina
    at Chapel Hill
    Chapel Hill, North Carolina —AI-50410
15. Yeshiva University
    New York, New York —AI-51519
16. University of Colorado
    Health Sciences Center
    Denver, Colorado —AI-54907
17. Vanderbilt University
    Nashville, Tennessee —AI-54999
18. Harvard Medical School
    Boston, Massachusetts —AI-60354
19. Duke University
    Durham, North Carolina —AI-64518

10. Research and Development Contracts

NHLBI Research and Development Contract Obligations*: Fiscal Years 1995–2005



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

NHLBI Total Research and Development Contract Obligations: Fiscal Years 1995–2005

Dollars (Thousands)

	Fiscal Year										
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Heart	$ 70,178	$ 80,373	$ 84,820	$ 77,886	$ 93,270	$ 98,715	$125,291	$155,971	$195,425	$187,043	$181,970
Lung	15,414	21,032	18,183	13,123	25,432	23,341	10,993	16,578	11,745	14,131	20,946
Blood	40,324	19,522	18,934	25,695	15,436	21,538	24,572	26,751	20,082	25,460	27,831
Women's Health Initiative	—	—	—	—	63,100	57,700	59,200	59,000	63,222	58,838	37,826
Total	**$125,916**	**$120,927[A]**	**$121,937[B]**	**$116,704[C]**	**$197,238[D]**	**$201,294[E]**	**$220,056[F]**	**$258,300[G]**	**$290,474[H]**	**$285,472[I]**	**$268,573[J]**

A Includes Program Evaluation Assessment of $4,250,000.
B Includes Program Evaluation and IMPAC II Assessments of $8,986,000.
C Includes Program Evaluation and IMPAC II Assessments of $12,589,000.
D Includes Program Evaluation and IMPAC II Assessments of $14,904,000.
E Includes Program Evaluation and IMPAC II Assessments of $17,944,000.
F Includes Program Evaluation and IMPAC II Assessments of $24,579,000.
G Includes Program Evaluation and IMPAC II Assessments of $35,827,000.
H Includes Program Evaluation and IMPAC II Assessments of $54,550,000.
I Includes Program Evaluation and IMPAC II Assessments of $57,545,722.
J Includes Program Evaluation and IMPAC II Assessments of $64,399,000.

Major NHLBI Research and Development Contracts by Program

	Total Obligations Prior to FY 2005	Total FY 2005 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Atherosclerosis Risk in Communities (ARIC)	$118,626,131	$3,340,113	$121,966,244
Cardiovascular Health Study (CHS)	74,160,240	1,725,937	75,886,177
Coronary Artery Risk Development in Young Adults (CARDIA)	70,571,397	1,266,999	71,838,396
DNA Resequencing and Genotyping	4,000,000	7,000,000	11,000,000
Framingham Study	62,166,638	—	62,166,638
Jackson Heart Study (JHS)	14,669,854	5,550,135	20,219,989
Mammalian Genotyping Service (MGS)	25,119,750	3,749,999	28,869,749
Multi-Ethnic Study of Atherosclerosis (MESA)	54,269,999	—	54,269,999
Pediatric Circulatory Support	4,808,544	3,772,658	8,581,202
Proteomics Initiative	72,997,890	5,896,000	78,893,890
Translational Behavioral Science Research Consortium	14,312,876	6,117,693	20,430,569
Lung Diseases			
Lung Tissue Research Consortium	3,999,995	6,499,999	10,499,994
Tuberculosis Curriculum Coordinating Center	3,000,000	750,000	3,750,000
Blood Diseases and Resources			
Maintenance of NHLBI Biological Specimen Repository	5,603,820	990,522	6,594,342
Retrovirus Epidemiology Donor Study (REDS)	73,774,125	13,091,000	86,865,125
Sickle Cell Disease Health-Related Quality of Life Questionnaire	—	584,008	584,008
Somatic Cell Therapy Processing Facilities	9,734,266	5,841,943	15,576,209

Heart and Vascular Diseases Program

Atherosclerosis Risk in Communities (ARIC), Initiated in Fiscal Year 1985

The ARIC program is a large-scale, long-term program that is measuring associations of CHD risk factors with atherosclerosis by race, gender, and geographic location. It focuses on early detection of CVD before symptoms, heart attacks, or strokes occur. The project consists of two groups: a community surveillance component and a cohort component from four communities. Three of the cohort components represent the racial mix of their community, whereas the fourth is exclusively black.

Obligations

Funding History:
Fiscal Year 2005—$3,340,113
Fiscal Years 1985–2004—$118,626,131
Total Funding to Date—$121,966,244

Current Active Organizations and Contract Numbers

1. University of North Carolina at Chapel Hill
   Chapel Hill, North Carolina —HC-55015
2. Baylor College of Medicine
   Houston, Texas —HC-55016
3. University of North Carolina at Chapel Hill
   Chapel Hill, North Carolina —HC-55018
4. University of Minnesota, Twin Cities
   Minneapolis, Minnesota —HC-55019
5. Johns Hopkins University
   Baltimore, Maryland —HC-55020
6. Mississippi Medical Center
   Jackson, Mississippi —HC-55021
7. University of Texas Health Science Center
   Houston, Texas —HC-55022

Cardiovascular Health Study (CHS), Initiated in Fiscal Year 1988

The CHS is a population-based, longitudinal study of risk factors for the development and progression of CHD

and stroke in elderly adults. Specific objectives for this phase of the project include identifying risk association with clinical disease by accumulation of events; determining whether presence or progression of subclinical disease (abnormalities detected noninvasively without signs or symptoms) are better predictors of clinical disease than traditional risk factors; identifying determinants of change in subclinical disease; and identifying characteristics of subgroups at low risk for developing CVD (in whom preventive measures may be unnecessary). Minority representation is sufficient to assess black–white differences.

Obligations

Funding History:
Fiscal Year 2005—$1,725,937
Fiscal Years 1988–2004—$74,160,240
Total Funding to Date—$75,886,177

Current Active Organizations and Contract Numbers

1. Johns Hopkins University
Baltimore, Maryland —HC-15103
2. University of Washington
Seattle, Washington —HC-55222
3. University of Washington
Seattle, Washington —HC-85079
4. Wake Forest University
Winston-Salem, North Carolina —HC-85080
5. Johns Hopkins University
Baltimore, Maryland —HC-85081
6. University of Pittsburgh
Pittsburgh, Pennsylvania —HC-85082
7. University of California, Davis
Davis, California —HC-85083
8. University of Vermont
Burlington, Vermont —HC-85086

Coronary Artery Risk Development in Young Adults (CARDIA), Initiated in Fiscal Year 1984

The purpose of this study is to increase understanding of contributors to changes in CVD risk factors that occur during the critical years of transition from adolescence through young adulthood to middle age in a cohort of black and white young adults, aged 18 to 30 years in 1985–1986. Currently, CARDIA is addressing questions about lifestyle/psychosocial/socioeconomic risk factors, race, genes, and inflammation in relation to subclinical CVD.

Obligations

Funding History:
Fiscal Year 2005—$1,266,999
Fiscal Years 1984–2004—$70,571,397
Total Funding to Date—$71,838,396

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 2005—$7,000,000
Fiscal Year 2004—$4,000,000
Total Funding to Date—$11,000,000

Current Active Organizations and Contract Numbers

1. Constella Group, Inc.
Bethesda, Maryland —HV-48193
2. University of Washington
Seattle, Washington —HV-48194
3. Johns Hopkins University
Baltimore, Maryland —HV-48195
4. Center for the Advancement of Genetics, Inc.
Rockville, Maryland —HV-48196

Framingham Study

The orginal Framingham 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 familial clustering of 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 2005—$0
Fiscal Years 1983–2004—$62,166,638
Total Funding to Date—$62,166,638

Current Active Organization and Contract Number

1. Boston University Medical Center
   Boston, Massachusetts —HC-25195

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 2005—$5,550,135*
Fiscal Years 1998–2004—$14,669,854
Total Funding to Date—$20,219,989

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

Mammalian Genotyping Service (MGS), Initiated in Fiscal Year 1994

The MGS provides genotyping to meritorious projects involving humans, mice, rats, zebrafish, and dogs in all disease areas. It provides genome-wide screens, using short tandem repeat polymorphisms, to assist in finding genes associated with health and disease. Currently, the capacity of the MGS is 7.7 million genotypes per year.

Obligations

Funding History:
Fiscal Year 2005—$3,749,999
Fiscal Years 1994–2004—$25,119,750
Total Funding to Date—$28,869,749

Current Active Organization and Contract Number

1. Marshfield Medical Research and
   Educational Foundation
   Marshfield, Wisconsin —HV-48141

Multi-Ethnic Study of Atherosclerosis (MESA), Initiated in Fiscal Year 1999

The purpose of this study is to investigate the prevalence, correlates, and progression of subclinical CVD, i.e., disease detected noninvasively before it has produced clinical signs and symptoms, in a population that is 38 percent white, 28 percent black, 22 percent Hispanic, and 12 percent Asian.

Obligations

Funding History:
Fiscal Year 2005—$0
Fiscal Years 1999–2004—$54,269,999
Total Funding to Date—$54,269,999

Current Active Organizations and Contract Numbers

1. University of Washington
   Seattle, Washington —HC-95159

* Additional funding is provided by the National Center on Minority Health and Health Disparities (NCMHD).

2. University of California, Los Angeles
Los Angeles, California —HC-95160
3. Columbia University
New York, New York —HC-95161
4. Johns Hopkins University
Baltimore, Maryland —HC-95162
5. University of Minnesota, Twin Cities
Minneapolis, Minnesota —HC-95163
6. Northwestern University
Chicago, Illinois —HC-95164
7. Wake Forest University
Winston-Salem, North Carolina —HC-95165
8. University of Vermont
Colchester, Vermont —HC-95166
9. New England Medical Center
Boston, Massachusetts —HC-95167
10. Johns Hopkins University
Baltimore, Maryland —HC-95168
11. Harbor-UCLA Research and Education Institute
Los Angeles, California —HC-95169

Pediatric Circulatory Support, Initiated in Fiscal Year 2004

The purpose of this program is to establish multidisciplinary teams to develop innovative circulatory assist devices or other bioengineered systems for infants and children with congenital and acquired CVD who experience cardiopulmonary failure and circulatory collapse.

Obligations

Funding History:
Fiscal Year 2005—$3,772,658
Fiscal Year 2004—$4,808,544
Total Funding to Date—$8,581,202

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 2005—$5,896,000
Fiscal Years 2002–2004—$72,997,890
Total Funding to Date—$78,893,890

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

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 2005—$6,117,693
Fiscal Years 2002–2004—$14,312,876
Total Funding to Date—$20,430,569

Current Active Organizations and Contract Numbers

1. Weill Medical College of Cornell University
New York, New York —HC-25196
2. Mount Sinai School of Medicine
New York, New York —HC-25197

Lung Diseases Program

Lung Tissue Research Consortium, Initiated in Fiscal Year 2004

The purpose of this program is to establish a consortium for collecting lung tissues and preparing and distributing them for research. Scientists seek to improve management of lung diseases by increasing understanding of the pathogenetic mechanisms of lung diseases through molecular histopathological studies on tissues with and without disease. Primary emphases are on COPD and idiopathic pulmonary fibrosis.

Obligations

Funding History:
Fiscal Year 2005—$6,499,999
Fiscal Year 2004—$3,999,995
Total Funding to Date—$10,499,994

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 2005—$750,000
Fiscal Years 2003–2004—$3,000,000
Total Funding to Date—$3,750,000

Current Active Organization and Contract Number

1. University of California, San Diego
La Jolla, California —HR-36157

Blood Diseases and Resources Program

Maintenance of 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 2005—$990,522
Fiscal Years 1998–2004—$5,603,820
Total Funding to Date—$6,594,342

Current Active Organization and Contract Number

1. BBI-Biotech Research Laboratories, Inc.
Gaithersburg, Maryland —HB-87144

Retrovirus Epidemiology Donor Study (REDS), Initiated in Fiscal Year 1989

This program was established to determine the prevalence of retrovirus positivity in blood donors, a majority of whom are minority. Researchers are evaluating the demographic, risk factor, and behavioral characteristics

of blood donors with high risks who continue to donate. A blood specimen repository also is being established as a mechanism for evaluating new tests for known viruses and as a sentinel for as-yet-unrecognized viruses.

Obligations

Funding History:
Fiscal Year 2005—$13,091,000
Fiscal Years 1989–2004—$73,774,125
Total Funding to Date—$86,865,125

Current Active Organizations and Contract Numbers

1. University of California, San Francisco
   San Francisco, California —HB-47114
2. Blood Center of Southeastern Wisconsin
   Milwaukee, Wisconsin —HB-47168
3. American Red Cross Blood Services
   Dedham, Massachusetts —HB-47169
4. Emory University
   Atlanta, Georgia —HB-47170
5. University of Cincinnati
   Cincinnati, Ohio —HB-47171
6. Institute for Transfusion Medicine
   Pittsburgh, Pennsylvania —HB-47172
7. University of California, San Francisco
   San Francisco, California —HB-47174
8. Westat, Inc.
   Rockville, Maryland —HB-47175
9. Oklahoma Blood Institute
   Oklahoma City, Oklahoma —HB-97078
10. Westat, Inc.
    Rockville, Maryland —HB-97082

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 2005—$584,008
Total Funding To Date—$584,008

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 2005—$5,841,943
Fiscal Years 2003–2004—$9,734,266
Total Funding to Date—$15,576,209

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 1995–2005

Research Grants and Cooperative Agreements (Dollars in Thousands)

	Fiscal Year										
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Heart and Vascular Diseases											
Program on Surgical Control of Hyperlipidemias (POSCH)	$ 538	$ 566	$ 294	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Emory Angioplasty Versus Surgery Trial (EAST)	296	296	—	—	—	—	—	—	—	—	—
Asymptomatic Carotid Artery Plaque Study (ACAPS)	66	70	—	—	—	—	—	—	—	—	—
Infant Heart Surgery: Central Nervous System Sequelae of Circulatory Arrest	598	699	685	582	584	392	75	—	—	—	—
Multicenter Unsustained Tachycardia Trial*	1,958	504	—	—	—	—	—	—	—	—	—
Women's Health Study (WHS)	1,426	1,434	1,473	1,536	1,530	1,594	—	—	—	—	889
Cardiovascular Risk Factors and the Menopause	451	478	494	528	186	—	—	—	—	—	—
Sodium Sensitivity in African Americans	249	—	—	—	—	—	—	—	—	—	—
Stress Reduction in Elderly Blacks With Hypertension	321	—	—	—	—	—	—	—	—	—	—
Trial of Nonpharmacologic Intervention in the Elderly (TONE)	729	—	—	—	—	—	—	—	—	—	—
CABG Patch Trial*	1,344	988	1,171	—	—	—	—	—	—	—	—
Women's Antioxidant and Cardiovascular Study (WACS)	620	643	501	525	540	556	572	598	592	599	670
Oral Calcium in Pregnant Women With Hypertension	306	320	332	—	—	—	—	—	—	—	—
Stress Reduction and Atherosclerotic CVD in Blacks	330	403	407	40	326	339	360	376	394	—	—
Enalapril After Anthracycline Cardiotoxicity	647	707	724	789	—	—	—	—	—	—	—
Stress and Anger Management for Blacks With Hypertension	232	241	250	—	—	—	—	—	—	—	—
Estrogen Replacement and Atherosclerosis (ERA) Trial*	260	1,213	965	1,668	1,017	—	—	—	—	—	—
Shock Trial: Should We Emergently Revascularize Occluded Coronaries for Cardiogenic Shock?	1,022	1,008	826	874	—	440	362	298	291	296	—
HDL-Atherosclerosis Treatment Study	480	427	445	340	—	326	—	—	—	—	—
Influence of Cardiopulmonary Bypass (CPB) Temperature on CABG Morbidity	107	118	—	—	—	—	—	—	—	—	—
Women's Estrogen/Progestin Lipid Lowering Hormone Atherosclerosis Regression Trial (WELL-HART)*	798	508	1,196	1,269	1,131	—	32	—	—	—	—
Mode Selection Trial in Sinus Node Dysfunction (MOST)*	2,163	1,857	2,096	1,700	2,879	1,136	154	—	—	—	—
Antioxidants and Prevention of Early Atherosclerosis*	793	240	603	—	—	—	—	—	—	—	—
Postmenopausal Hormone Therapy in Unstable Angina	253	258	264	271	276	—	—	—	—	—	—

* Paid by U01/U10.

NHLBI Investigator-Initiated Clinical Trials: Fiscal Years 1995–2005 (continued)

Research Grants and Cooperative Agreements (Dollars in Thousands)

	Fiscal Year										
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Heart and Vascular Diseases (continued)											
Estrogen and Graft Atherosclerosis Research Trial (EAGER)*	—	476	488	305	—	361	371	—	—	—	—
Soy Estrogen Alternative Study (SEA)	—	219	217	221	—	—	—	—	—	—	—
REMATCH Trial*	—	—	1,258	1,798	1,333	825	750	—	—	—	—
Dietary Patterns, Sodium Intake, and Blood Pressure (DASH Sodium)*†	—	—	2,233	3,693	3,646	1,247	151	387	376	395	—
Sudden Cardiac Death in Heart Failure Trial (SCD-HeFT)*	—	—	1,571	1,667	1,709	1,698	1,798	1,412	1,930	—	—
CVD Risk and Health in Post-Menopausal Phytoestrogen Users	—	—	631	662	574	244	—	304	152	—	—
Treatment of Hypertension With Two Exercise Intensities	—	—	359	474	473	481	420	—	—	—	—
Prevention of Recurrent Venous Thromboembolism (PREVENT)	—	—	—	1,242	894	521	543	1,272	—	—	—
PREMIER: Lifestyle Interventions for Blood Pressure Control*	—	—	—	2,234	3,425	3,595	2,925	1,505	—	—	—
Azithromycin and Coronary Events Study (ACES)*	—	—	—	847	2,663	2,182	720	1,254	1,137	—	—
Antiarrhythmic Effects of N-3 Fatty Acids	—	—	—	—	514	542	529	647	—	—	—
Fatty Acid Antiarrhythmia Trial (FAAT)	—	—	—	—	519	605	—	—	—	—	—
Occluded Artery Trial (OAT)*	—	—	—	—	4,892	5,079	2,604	1,724	1,963	—	—
Bypass Angioplasty Revascularization Investigation in Type 2 Diabetics (BARI 2D)*	—	—	—	—	—	3,942	6,515	9,342	8,189	8,265	8,304
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
Reduction of Triglycerides in Women on HRT	—	—	—	—	—	—	708	746	555	544	721
Women's Ischemia Syndrome Evaluation (WISE)*†	—	—	—	—	—	—	1,502	1,506	1,306	1,303	996
ACE Inhibition and Novel Cardiovascular Risk Factors	—	—	—	—	—	—	—	694	656	602	—
Heart Failure: A Controlled Trial Investigating Outcomes of Exercise (HF-ACTION)*	—	—	—	—	—	—	—	7,471	9,582	7,973	4,483
Clinical Trial of Dietary Protein on Blood Pressure	—	—	—	—	—	—	—	655	610	612	504
Home Automatic External Defibrillator Trial (HAT)*	—	—	—	—	—	—	—	3,567	5,433	4,264	1,801
Perioperative Interventional Neuroprotection Trial (POINT)	—	—	—	—	—	—	—	553	553	562	572
Stop Atherosclerosis in Native Diabetics Study (SANDS)*	—	—	—	—	—	—	—	2,410	2,165	2,107	2,324
Surgical Treatment for Ischemic Heart Failure (STICH)*	—	—	—	—	—	—	—	5,709	4,495	1,613	6,082
Girls Health Enrichment Multisite Studies (GEMS)*	—	—	—	—	—	—	—	—	2,461	2,400	2,370
Treatment of Depression Following Bypass Surgery	—	—	—	—	—	—	—	—	964	1,132	1,181
Weight Loss Maintenance (WLM)*	—	—	—	—	—	—	—	—	3,687	4,368	3,099
Cardiovascular Outcomes in Renal Atherosclerotic Lesions (CORAL)*	—	—	—	—	—	—	—	—	—	4,343	5,610

* Paid by U01/U10

† Previously an Institute-Initiated Clinical Trial.

NHLBI Investigator-Initiated Clinical Trials: Fiscal Years 1995–2005 (continued)

Research Grants and Cooperative Agreements (Dollars in Thousands)

	Fiscal Year										
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Heart and Vascular Diseases (continued)											
FREEDOM Trial: Future Revascularization Evaluation in Patients with Diabetes Mellitus: Optional Management of Multivessel Disease	—	—	—	—	—	—	—	—	—	3,663	4,669
IMMEDIATE Trial: Immediate Myocardial Metabolic Enhancement During Initial Assessment and Treatment in Emergency Care*	—	—	—	—	—	—	—	—	—	5,170	9,514
AIM HIGH: Niacin Plus Statin To Prevent Vascular Events*	—	—	—	—	—	—	—	—	—	—	663
Claudication: Exercise Versus Endoluminal Revascularization (CLEVER)*	—	—	—	—	—	—	—	—	—	—	1,368
Subtotal, Heart and Vascular Diseases	15,987	13,673	19,483	23,265	29,111	26,578	22,996	45,253	50,163	52,377	56,681
Lung Diseases											
Cardiopulmonary Effects of Ibuprofen in Human Sepsis*	—	—	—	—	—	—	—	—	—	—	—
Inhaled Beclomethasone To Prevent Chronic Lung Disease*	738	551	436	—	—	—	—	—	—	—	—
Lung Health Study II*†	4,434	3,183	3,508	980	—	—	—	—	—	—	—
Lung Health Study III*†	—	—	—	1,997	1,986	1,616	1,672	927	—	—	—
Asthma Clinical Research Network (ACRN)*†	—	—	—	4,934	5,399	5,686	5,705	5,863	—	—	—
Fetal Tracheal Occlusion for Severe Diaphragmatic Hernia*	—	—	—	—	419	429	181	—	—	—	—
Scleroderma Lung Study*	—	—	—	—	1,040	1,501	1,761	1,501	1,055	—	—
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	—	—
Apnea Positive Pressure Long-Term Efficacy Study (APPLES)*	—	—	—	—	—	—	—	3,224	3,021	3,110	3,188
Childhood Asthma Management Program–Continuation Study (CAMP–CS)/Phase 2*†	—	—	—	—	—	—	—	—	1,489	2,043	2,623
Clinical Trial of Acid Reflux Therapy in Asthma*	—	—	—	—	—	—	—	—	736	783	791
Impact of CPAP on Functional Outcomes in Milder Obstructive Sleep Apnea (CATNAP)	—	—	—	—	—	—	—	—	682	612	608
Outcomes of Sleep Disorders in Older Men	—	—	—	—	—	—	—	—	4,163	4,262	1,390
Supplemental Selenium and Vitamin E and Pulmonary Function	—	—	—	—	—	—	—	—	698	610	630
Improving Asthma Care in Minority Children in Head Start	—	—	—	—	—	—	—	—	—	721	826
Subtotal, Lung Diseases	5,172	3,734	3,944	7,911	8,844	15,484	17,076	18,974	15,639	14,289	10,056
Blood Diseases and Resources											
Multicenter Study of Hydroxyurea in Patients With Sickle Cell Anemia—Phase II*	1,238	—	—	—	—	—	—	—	—	—	—
Trial To Reduce Alloimmunization to Platelets (TRAP)—Extension†	1,246	263	—	—	—	—	—	—	—	—	—

* Paid by U01/U10

† Previously an Institute-Initiated Clinical Trial.

NHLBI Investigator-Initiated Clinical Trials: Fiscal Years 1995–2005 (continued)

Research Grants and Cooperative Agreements (Dollars in Thousands)

	Fiscal Year										
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Blood Diseases and Resources (continued)											
Stroke Prevention in Sickle Cell Anemia (STOP)*	3,257	2,435	2,584	2,036	—	293	—	—	—	—	—
Pediatric Hydroxyurea in Sickle Cell Anemia (PED HUG)	250	260	270	—	—	—	—	—	—	—	—
Stroke Prevention in Sickle Cell Anemia (STOP 2)*	—	—	—	—	—	4,200	3,166	3,168	2,320	2,366	—
Induction of Stable Chimerism for Sickle Cell Anemia	—	—	—	—	—	—	489	525	527	551	—
Sibling Donor Cord Blood Banking and Transplantation	—	—	—	—	—	—	1,222	1,224	1,286	1,353	—
FOCUS	—	—	—	—	—	—	—	—	1,639	1,796	2,923
Stroke With Transfusions Changing to Hydroxyurea (SWITCH)*	—	—	—	—	—	—	—	—	—	—	3,345
Subtotal, Blood Diseases and Resources	5,991	2,958	2,854	2,036	—	4,493	4,877	4,917	5,772	6,066	6,268
Total, NHLBI	**$27,150**	**$20,365**	**$26,281**	**$33,212**	**$37,955**	**$46,555**	**$44,949**	**$69,144**	**$71,574**	**$82,220**	**$73,005**

* Paid by U01/U10

† Previously an Institute-Initiated Clinical Trial.

NHLBI Investigator-Initiated Clinical Trials: Fiscal Years 1995–2005 (continued)

NHLBI Investigator-Initiated Clinical Trials, Fiscal Year 2005: Summary by Program

	Total Obligations Prior to FY 2005	FY 2005 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
AIM HIGH: Niacin Plus Statin To Prevent Vascular Events*	—	663,376	663,376
Bypass Angioplasty Revascularization Investigation in Type 2 Diabetics (BARI 2D)*	36,253,973	8,304,235	44,558,208
Cardiovascular Outcomes in Renal Atherosclerotic Lesions (CORAL)*	4,343,389	5,610,035	9,953,424
Claudication: Exercise Versus Endoluminal Revascularization (CLEVER)	—	1,368,413	1,368,413
Clinical Trial of Dietary Protein on Blood Pressure	1,877,176	504,047	2,381,223
FREEDOM Trial: Future Revascularization Evaluation in Patients with Diabetes Mellitus: Optimal Management of Multivessel Disease	3,663,095	4,669,362	8,332,457
Girls Health Enrichment Multisite Studies*	4,861,435	2,369,517	7,230,952
Heart Failure: A Controlled Trial Investigating Outcomes of Exercise Training (HF-ACTION)*	25,025,952	4,483,140	29,509,092
Heart Failure Adherence and Retention Trial (HART)	5,038,583	861,475	5,900,058
Home Automatic External Defibrillator Trial (HAT)*	13,263,642	1,800,742	15,064,384
IMMEDIATE Trial: Immediate Myocardial Metabolic Enhancement During Initial Assessment and Treatment in Emergency Care*	5,170,411	9,513,736	14,684,147
Perioperative Interventional Neuroprotection Trial (POINT)	1,668,047	571,974	2,240,021
Reduction of Triglycerides in Women on HRT	2,554,495	720,614	3,275,109
Stop Atherosclerosis in Native Diabetics Study (SANDS)*	6,681,337	2,323,642	9,004,979
Surgical Treatment for Ischemic Heart Failure (STICH)*	11,817,086	6,082,190	17,899,276
Treatment of Depression Following Bypass Surgery	2,096,012	1,180,897	3,276,909
Weight Loss Maintenance (WLM)*	8,054,488	3,098,894	11,153,382
Women's Antioxident and Cardiovasular Study (WACS)	6,94,2751	669,855	7,612,606
Women's Health Study (WHS)	16,033,881	888,766	16,922,647
Women's Ischemia Syndrome Evaluation (WISE)*†	5,617,360	995,753	6,613,113
Subtotal, Heart and Vascular Diseases	160,963,113	56,680,663	217,643,776
Lung Diseases			
Acid Reflux Therapy in Asthma*	1,519,544	791,142	2,310,686
APPLES: Apnea Positive Pressure Long-Term Efficacy Study*	9,354,009	3,188,172	12,542,181
Childhood Asthma Management Program II (CAMP II)*	3,532,802	2,622,721	6,155,523
Impact of CPAP on Functional Outcomes in Milder Obstructive Sleep Apnea (CATNAP)	1,294,011	608,093	1,902,104
Improving Asthma Care for Minority Children in Head Start	721,025	826,110	1,547,135
Outcomes of Sleep Disorders in Older Men	8,424,494	1,389,672	9,814,166
Supplemental Selenium and Vitamin E and Pulmonary Function	1,308,074	630,237	1,938,311
Subtotal, Lung Diseases	26,153,959	10,056,147	36,210,106
Blood Diseases and Resources			
FOCUS*	3,435,202	2,922,730	6,357,932
Stroke With Transfusions Changing to Hydroxyurea (SWITCH)*	—	3,345,345	3,345,345
Subtotal, Blood Diseases and Resources	3,435,202	6,268,075	9,703,277
Total, NHLBI	**$190,552,274**	**$73,004,885**	**$263,557,159**

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

Institute-Initiated Clinical Trials: Fiscal Years 1995–2005

Contracts

Dollars (Thousands)

	Fiscal Year										
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Heart and Vascular Diseases											
Lipid Research Clinics	$ 583	$ 660	$ 650	$ 685	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Effects of Digitalis on Survival in Patients With Congestive Heart Failure	2,235	—	—	—	—	—	—	—	—	—	—
Asymptomatic Cardiac Ischemia Pilot Study (ACIP)	7	—	—	—	—	—	—	—	—	—	—
Psychophysiological Investigations of Myocardial Ischemia (PIMI)	165	—	—	—	—	—	—	—	—	—	—
Arterial Disease Multifactorial Intervention Trial (ADMIT)	395	—	—	—	—	—	—	—	—	—	—
Raynaud's Treatment Study	1,664	221	19	—	—	—	—	—	—	—	—
Antiarrhythmic vs. Implantable Defibrillator (AVID)	5,348	2,475	—	871	548	—	—	—	—	—	—
Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT)	3,412	9,676	15,943	17,119	—	6,259	7,000	3,980	2,761	3,346	—
Activity Counseling Trial (ACT)	5,000	—	2,167	2,439	—	—	—	—	—	—	—
Postmenopausal Estrogen/Progestin Interventions (PEPI)	1,305	—	3	170	—	—	—	—	—	—	—
Enhancing Recovery in Coronary Heart Disease Patients (ENRICHD)	1,871	6,993	6,837	5,904	3,303	3,487	596	425	70	—	—
Atrial Fibrillation Follow-up: Investigation in Rhythm Management (AFFIRM)	883	2,510	6,330	—	3,785	1,239	2,401	802	—	—	—
Beta-Blocker Evaluation Survival Trial (BEST)	2,500	1,435	2,300	2,448	—	—	—	—	—	—	—
Women's Angiographic Vitamin and Estrogen Trial (WAVE)	—	731	2,891	1,917	3,878	886	756	—	32	—	—
Women's Ischemia Syndrome Evaluation (WISE)	—	1,577	133	2,932	856	1,424	10	50	—	—	—
Prevention of Events With Angiotensin Converting Enzyme Inhibitor Therapy (PEACE)	—	3,632	2,838	2,836	2,850	5,988	—	2,849	558	—	—
Magnesium in Coronaries (MAGIC)	—	—	—	1,169	2,009	1,243	—	238	—	—	—
Evaluation Study of Congestive Heart Failure and Pulmonary Artery Catheterization Effectiveness (ESCAPE)	—	—	—	—	1,750	1,820	—	1,129	—	—	—
Action to Control Cardiovascular Risk in Diabetes (ACCORD)	—	—	—	—	4,130	6,590	—	1,750	18,521	33,779	26,126
Public Access Defibrillation (PAD) Community Trial	—	—	—	—	2,923	2,414	3,058	1,101	—	—	—
Trial of Aldosterone Antagonist Therapy in Adults With Preserved Ejection Fraction Congestive Heart Failure (TOPCAT)	—	—	—	—	—	—	—	—	—	837	5,126
Subtotal, Heart and Vascular Diseases	25,368	29,910	40,111	38,490	26,032	31,350	13,821	12,324	21,942	37,962	31,288
Lung Diseases											
Lung Health Study I	650	350	—	—	—	—	—	—	—	—	—
Pediatric Pulmonary and Cardiac Complications of HIV Infection (P2C2)	2,627	4,033	668	1,979	—	315	—	113	—	—	—

Institute-Initiated Clinical Trials: Fiscal Years 1995–2005

Contracts (continued)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Lung Diseases (continued)											
Childhood Asthma Management Program (CAMP)	5,096	7,977	5,695	—	6,551	729	1,330	2,786	2,287	1,475	599
Acute Respiratory Distress Syndrome Clinical Network (ARDSNet)	4,170	4,337	4,510	4,880	6,837	5,587	2,667	1,502	4,402	5,517	4,707
National Emphysema Treatment Trial (NETT)	—	—	2,710	3,367	7,545	4,047	6,989	7,910	1,630	1,648	357
Feasibility of Retinoid Treatment in Emphysema (FORTE)	—	—	—	—	884	7,711	—	2,429	725	507	185
Subtotal, Lung Diseases	12,543	16,697	13,583	10,226	21,817	18,389	10,986	14,740	9,044	9,147	5,848
Blood Diseases and Resources											
Clinical Course of Sickle Cell Disease	4,375	376	205	2,144	350	106	—	—	—	—	—
Anti-HIV Immunoglobulin (HIVIG) in Prevention of Maternal-Fetal HIV Transmission	1,819	706	—	—	—	—	—	—	—	—	—
T-Cell Depletion in Unrelated Donor Marrow Transplantation	1,917	1,461	639	2,228	690	1,085	1,144	557	774	164	—
Viral Activation Transfusion Study (VATS)	5,000	5,647	2,353	1,668	—	339	—	—	—	—	—
Cord Blood Stem Cell Transplantation Study (COBLT)	—	1,419	6,573	12,530	1,456	5,122	1,846	2,166	588	707	822
Multicenter Study of Hydroxyurea (MSH) in Sickle Cell Anemia Adult Follow-up	—	703	472	475	469	—	—	588	994	1,136	1,340
Pediatric Hydroxyurea Phase III Clinical Trial (BABY HUG)	—	—	—	—	—	1,606	405	3,100	1,112	1,964	1,526
Subtotal, Blood Diseases and Resources	13,111	10,312	10,242	19,045	2,965	8,258	3,395	6,411	3,468	3,971	3,688
Women's Health Initiative											
Subtotal, Women's Health Initiative	—	—	—	—	59,100	57,700	59,200	59,010	63,222	57,483	37,826
Total, NHLBI Clinical Trials Contracts	**$51,022**	**$56,919**	**$63,936**	**$67,761**	**$109,914**	**$115,697**	**$87,402**	**$92,485**	**$97,676**	**$108,563**	**$78,650**

Institute-Initiated Clinical Trials: Fiscal Years 1995–2005 (continued)

Cooperative Agreements

Dollars (Thousands)

	Fiscal Year										
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Heart and Vascular Diseases											
Trials of Hypertension Prevention (TOHP)	$1,240	$ 649	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Dietary Intervention Study in Children (DISC)	1,625	1,625	746	—	—	—	—	—	—	—	—
Bypass Angioplasty Revascularization Investigation (BARI)	3,882	2,757	2,894	1,360	1,609	1,634	1,549	1,456	—	—	—
Postmenopausal Estrogen/ Progestin Interventions (PEPI)	584	331	—	—	—	—	—	—	—	—	—
Child and Adolescent Trial for Cardiovascular Health (CATCH)	2,342	2,682	3,956	572	210	—	—	—	—	—	—
Dietary Effects on Lipoproteins and Thrombogenic Activity (DELTA)	2,485	132	290	—	—	—	—	—	—	—	—
Obesity Prevention in Young American Indians (PATHWAYS)	2,150	3,432	4,119	3,945	4,196	2,459	—	—	—	—	—
Dietary Approaches To Stop Hypertension (DASH)	2,513	899	—	—	—	—	—	—	—	—	—
Rapid Early Action for Coronary Treatment (REACT)	5,091	4,992	2,866	496	—	—	—	—	—	—	—
Girls Health Enrichment Multisite Studies (GEMS)	—	—	—	—	2,282	2,365	2,877	2,713	—	—	—
Trial of Activity for Adolescent Girls (TAAG)	—	—	—	—	—	5,274	4,831	5,919	5,828	6,350	5,103
Pediatric Cardiovascular Clinical Research Network	—	—	—	—	—	—	3,447	4,822	5,381	4,948	3,992
Clinical Research Consortium To Improve Resuscitation Outcome	—	—	—	—	—	—	—	—	—	6,886	9,339
Dynamic Assessment of Patient-Reported Chronic Disease Outcomes	—	—	—	—	—	—	—	—	—	1,010	—
Clinical Trials in Organ Transplantation (CTOT)	—	—	—	—	—	—	—	—	—	—	1,900
Subtotal, Heart and Vascular Diseases	21,912	17,499	14,871	6,373	8,297	11,732	12,704	14,910	11,209	19,194	20,334
Lung Diseases											
Asthma Clinical Research Network (ACRN)*	3,640	4,526	4,479	—	—	—	—	—	8,181	8,424	8,667

* Investigator-Initiated from 1998 to 2002.

Institute-Initiated Clinical Trials: Fiscal Years 1995–2005 (continued)

Cooperative Agreements (continued)

Dollars (Thousands)

	Fiscal Year										
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Lung Diseases (continued)											
Asthma and Pregnancy Studies	991	1,000	913	—	—	—	—	—	—	—	—
Childhood Asthma Research and Education (CARE) Network	—	—	—	—	4,175	5,002	5,314	6,005	5,610	5,292	5,704
COPD Clinical Research Network	—	—	—	—	—	—	—	—	6,843	6,848	8,438
Idiopathic Pulmonary Fibrosis Clinical Research	—	—	—	—	—	—	—	—	—	—	3,486
Subtotal, Lung Diseases	4,631	5,526	5,392	—	4,175	5,002	5,314	6,005	20,634	20,564	26,295
Blood Diseases and Resources											
Thalassemia (Cooley's Anemia) Clinical Research Network	—	—	—	—	—	2,192	2,219	2,269	2,320	2,375	2,730
Blood and Marrow Transplant Clinical Research Network	—	—	—	—	—	—	5,360	5,899	5,950	5,292	6,460
Transfusion Medicine/ Hemostasis Clinical Research Network	—	—	—	—	—	—	—	6,053	6,241	6,093	6,221
Subtotal, Blood Diseases and Resources	—	—	—	—	—	2,192	7,579	14,221	14,511	14,440	15,411
Total, NHLBI-Initiated Clinical Trials, Cooperative Agreements	**$26,543**	**$23,025**	**$20,263**	**$6,373**	**$12,472**	**$18,926**	**$25,597**	**$35,136**	**$46,354**	**$54,198**	**$62,040**
Total, NHLBI-Initiated Clinical Trials	**$77,565**	**$79,944**	**$84,199**	**$74,134**	**$122,386**	**$134,623**	**$112,999**	**$127,621**	**$144,030**	**$162,761**	**$140,690**

Institute-Initiated Clinical Trials, Fiscal Year 2005: Summary by Program

Contracts

	Total Obligations Prior to FY 2005	Total FY 2005 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Action To Control Cardiovascular Risk in Diabetes (ACCORD)	$ 64,769,478	$ 26,126,324	$90,895,802
Antihypertensive and Lipid-Lowering Treatment To Prevent Heart Attack Trial (ALLHAT)	83,170,059	—	83,170,059
Trial of Aldosterone Antagonists Therapy in Adults With Ejection Fraction Congestive Heart Failure (TOPCAT)	837,227	5,161,746	5,998,973
Subtotal, Heart and Vascular Diseases	148,776,764	31,288,070	180,064,834
Lung Diseases			
Acute Respiratory Distress Syndrome Clinical Network (ARDSNet)	46,208,966	4,706,675	50,915,641
Childhood Asthma Management Program (CAMP)	56,320,611	599,206	56,919,817
Feasibility of Retinoid Treatment in Emphysema (FORTE)	12,256,041	185,012	12,441,053
National Emphysema Treatment Trial (NETT)	35,846,310	357,270	36,203,580
Subtotal, Lung Diseases	150,631,928	5,848,163	156,480,091
Blood Diseases and Resources			
Cord Blood Stem Cell Transplantation Study (COBLT)	32,406,365	822,243	33,228,608
Multicenter Study of Hydroxyurea (MSH) in Sickle Cell Anemia Adult Follow-up	4,836,836	1,340,090	6,176,926
Pediatric Hydroxyurea Phase III Clinical Trial (BABY HUG)	8,187,198	1,526,201	9,713,399
Subtotal, Blood Diseases and Resources	45,430,399	3,688,534	49,118,933
Women's Health Initiative			
Subtotal, Women's Health Initiative	672,615,477	37,826,017	710,441,494
Total, NHLBI-Initiated Clinical Trials, Contracts	**$1,017,454,468**	**$78,650,784**	**$1,096,105,352**

Cooperative Agreements

	Total Obligations Prior to FY 2005	Total FY 2005 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Clinical Research Consortium To Improve Resuscitation Outcome	$6,886,109	$9,338,606	$16,224,715
Clinical Trials in Organ Transplantation (CTOT)	—	1,900,000	1,900,000
Dynamic Assessment of Patient-Reported Chronic Disease Outcomes	1,009,694	—	1,009,694
Pediatric Cardiovascular Clinical Research Network	18,598,211	3,992,212	22,590,423
Trial of Activity for Adolescent Girls (TAAG)	28,202,937	5,102,829	33,305,766
Subtotal, Heart and Vascular Diseases	54,696,951	20,333,647	75,030,598
Lung Diseases			
Asthma Clinical Research Network	16,605,558	8,667,026	25,272,584
Childhood Asthma Research and Education (CARE) Network	31,398,337	5,704,202	37,102,539
COPD Clinical Research Network	13,691,750	8,437,795	22,129,545
Idiopathic Pulmonary Fibrosis Clinical Research Network	—	3,486,226	3,486,226
Subtotal, Lung Diseases	61,695,645	26,295,249	87,990,894
Blood Diseases and Resources			
Blood and Marrow Transplant Clinical Research Network	23,181,808	6,459,743	29,641,551
Thalassemia (Cooley's Anemia) Clinical Research Network	11,374,688	2,729,989	14,104,677
Transfusion Medicine/Hemostasis Clinical Research Network	18,386,476	6,221,140	24,607,616
Subtotal, Blood Diseases and Resources	52,942,972	15,410,872	68,353,844
Total, NHLBI-Initiated Clinical Trials, Cooperative Agreements	**$169,335,568**	**$62,039,768**	**$231,375,336**
Total, NHLBI-Initiated Clinical Trials	**$1,186,790,163**	**$140,690,552**	**$1,327,480,688**

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 2005—$26,126,324
Fiscal Years 1999–2004—$64,769,478
Total Funding to Date—$90,895,802

Current Active Organizations and Contract Numbers

1. Veterans Affairs Medical Center, Albuquerque
   Albuquerque, New Mexico —HC-10100
2. Veterans Affairs Medical Center, Memphis
   Memphis, Tennessee —HC-90350
3. Wake Forest University
   Winston-Salem, North Carolina —HC-95178
4. McMaster University
   Hamilton, Ontario —HC-95179
5. University of Washington
   Seattle, Washington —HC-95180
6. Case Western Reserve University
   Cleveland, Ohio —HC-95181
7. Wake Forest University
   Winston-Salem, North Carolina —HC-95182
8. Minneapolis Medical Research Foundation
   Minneapolis, Minnesota —HC-95183
9. Trustees of Columbia University of New York
   New York, New York —HC-95184

Antihypertensive and Lipid-Lowering Treatment To Prevent Heart Attack Trial (ALLHAT), Initiated in Fiscal Year 1993

The ALLHAT is a practice-based, randomized clinical trial to determine whether combined incidence of fatal CHD and nonfatal MI differs between diuretic-based and newer antihypertensive treatments (ACE inhibitor, calcium channel blocker, alpha blocker) in high-risk hypertensive patients. The objective of the lipid-lowering component of the study is to determine whether lowering serum cholesterol with an HMG CoA reductase inhibitor reduces the total mortality in a subset of hypertensive patients with moderately elevated LDL cholesterol. Because blacks and Hispanics are at high risk for hypertension and CHD, investigators recruited a high percentage of minorities into the study.

In February 2000, the alpha blocker arm of the study was discontinued at the recommendation of the Data Safety Monitoring Committee and an independant expert review committee because the CVD event rate was significantly greater among those patients compared to the control group.

Obligations

Funding History:
Fiscal Year 2005—$0
Fiscal Years 1993–2004—$83,170,059
Total Funding to Date—$83,170,059

Current Active Organization and Contract Number

1. University of Texas Health Science Center
   Houston, Texas —HC-35130

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 2005—$9,338,606
Fiscal Year 2004—$6,886,109
Total Funding to Date—$16,224,715

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 2005—$1,900,000
Total Funding to Date—$1,900,000

Current Active Organizations and Contract Numbers

1. University of Pennsylvania
Philadelphia, Pennsylvania —AI-063589
2. Cleveland Clinic Lerner College of
Medicine-Case Western Reserve University
Cleveland, Ohio —AI-063594
3. Brigham and Women's Hospital
Boston, Massachusetts —AI-063623

Dynamic Assessment of Patient-Reported Chronic Disease Outcomes, Initiated in Fiscal Year 2004

The purpose of this study, which emanates from a NIH Roadmap Initiative, is to develop a computerized system of patient-reported outcomes that will meet the needs of clinical researchers across a wide variety of chronic disorders and diseases. Investigators will develop and test a large bank of items measuring patient-reported outcomes; create a computerized adaptive testing system that will allow for efficient assessment of patient-reported outcomes in clinical research; and create a publicly available system that can be added to and modified periodically for clinical researchers.

Obligations

Funding History:
Fiscal Year 2005—$0
Fiscal Year 2004—$1,009,694
Total Funding to Date—$1,009,694

Current Active Organizations and Grant Numbers

1. University of Pittsburgh
Pittsburgh, Pennsylvania —AR-52155
2. Stanford University
Stanford, California —AR-52158
3. State University New York, Stony Brook
Stony Brook, New York —AR-52170
4. University of Washington
Seattle, Washington —AR-52171
5. Evanston Northwestern Healthcare
Evanston, Illinois —AR-52177
6. University of North Carolina
at Chapel Hill
Chapel Hill, North Carolina —AR-52181
7. Duke University
Durham, North Carolina —AR-52186

Pediatric Cardiovascular Clinical Research 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 2005—$3,992,212
Fiscal Years 2001–2004—$18,598,211
Total Funding to Date—$22,590,423

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

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 2005—$5,102,829
Fiscal Years 2000–2004—$28,202,937
Total Funding to Date—$33,305,766

Current Active Organizations and Grant Numbers

1. University of Minnesota, Twin Cities
Minneapolis, Minnesota —HL-066845
2. University of South Carolina
Columbia, South Carolina —HL-066852
3. University of North Carolina
at Chapel Hill
Chapel Hill, North Carolina —HL-066853
4. Tulane University
New Orleans, Louisiana —HL-066855
5. San Diego State University
San Diego, California —HL-066856
6. Johns Hopkins University
Baltimore, Maryland —HL-066857
7. University of Arizona
Tucson, Arizona —HL-066858

Trial of Aldosterone Antagonists in Adults With Preserved Ejection Fraction Congestive Heart Failure, (TOPCAT) Initiated in Fiscal Year 2004

The purpose of this study is to evaluate the effectiveness of aldosterone antagonist therapy to reduce mortality in patients who have heart failure with preserved systolic function.

Obligations

Funding History:
Fiscal Year 2005—$5,161,746
Fiscal Year 2004—$837,227
Total Funding to Date—$5,998,973

Current Active Organization and Contract Number

1. New England Research Institutes, Inc.
Watertown, Massachusetts —HC-45207

Lung Diseases Program

Acute Respiratory Distress Syndrome Clinical Network (ARDSNet), Initiated in Fiscal Year 1994

The objective of this network is to test new therapeutic agents with a potential for improving the outcome of patients with ARDS and those at risk of developing ARDS.

Obligations

Funding History:
Fiscal Year 2005—$4,706,675
Fiscal Years 1994–2004—$46,208,966
Total Funding to Date—$50,915,641

Current Active Organizations and Contract Numbers

1. Vanderbilt University
Nashville, Tennessee —HR-46054
2. University of Washington
Seattle, Washington —HR-46055
3. University of Michigan at Ann Arbor
Ann Arbor, Michigan —HR-46057
4. University of California, San Francisco
San Francisco, California —HR-46059
5. Cleveland Clinic Foundation
Cleveland, Ohio —HR-46060
6. University of Colorado
Denver, Colorado —HR-46061
7. LDS Hospital
Salt Lake City, Utah —HR-46062
8. University of Maryland
Baltimore, Maryland —HR-46063
9. Coordinating Center
Massachusetts General Hospital
Boston, Massachusetts —HR-46064
10. Baylor College of Medicine
Houston, Texas —HR-16146
11. Baystate Medical Center
Springfield, Massachusetts —HR-16147

12. University of Chicago
Chicago, Illinois —HR-16149
13. Louisiana State University
New Orleans, Louisiana —HR-16150
14. University of Pittsburgh
Pittsburgh, Pennsylvania —HR-16152
15. University of Virginia
Charlottesville, Virginia —HR-16154
16. Wake Forest University
Winston-Salem, North Carolina —HR-16155
17. Baystate Medical Center
Springfield, MA —HR-56165
18. University of California, San Francisco
San Francisco, CA —HR-56166
19. University of Colorado Health Sciences Center
Denver, Colorado —HR-56167
20. Cleveland Clinic Lerner College of Medicine-Case Western Reserve University
Cleveland, Ohio —HR-56168
21. Duke University Medical Center
Durham, North Carolina —HR-56169
22. John Hopkins University
Baltimore, Maryland —HR-56170
23. HC Health Services, Inc.
Salt Lake City, Utah —HR-56171
24. Louisiana State University
New Orleans, Louisiana —HR-56172
25. University of Washington
Seattle, Washington —HR-56173
26. Vanderbilt University Medical Center
Nashville, Tennessee —HR-56174
27. Wake Forest University Health Sciences
Winston-Salem, North Carolina —HR-56175
28. Mayo Clinic College of Medicine
Rochester, Minnesota —HR-56176
29. Massachusetts General Hospital
Boston, Massachusetts —HR-56179

Asthma Clinical Research Network (ACRN), 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 2005—$8,667,026
Fiscal Years 2003–2004—$16,605,558
Total Funding to Date—$25,272,584

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 Management Program (CAMP), Initiated in Fiscal Year 1991

The purpose of this study is to evaluate the long-term effects of anti-inflammatory therapy compared to bronchodilator therapy on the course of asthma, particularly on lung function and bronchial hyperresponsiveness, and on physical and psychosocial growth and development. Results showed that 4 ½ to 6 years of daily treatment with inhaled corticosteroids was safe and provided superior control of asthma compared to a different anti-inflammatory medication or treatment only when symptoms occurred. The CAMP study will continue to observe the children for 5 years to determine the effect of early treatment on maximum lung growth and on height.

Obligations

Funding History:
Fiscal Year 2005—$599,206
Fiscal Years 1991–2004—$56,320,611
Total Funding to Date—$56,919,817

Current Active Organizations and Contract Numbers

1. Johns Hopkins University
Baltimore, Maryland —HR-16044
2. University of California, San Diego
La Jolla, California —HR-16045
3. University of New Mexico
Albuquerque, New Mexico —HR-16046

4. Hospital for Sick Children
Toronto, Ontario —HR-16047
5. National Jewish Medical and Research Center
Denver, Colorado —HR-16048
6. Brigham and Women's Hospital
Boston, Massachusetts —HR-16049
7. Asthma, Inc.
Seattle, Washington —HR-16050
8. Washington University
St. Louis, Missouri —HR-16051
9. Johns Hopkins University
Baltimore, Maryland —HR-16052

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 2005—$5,704,202
Fiscal Years 1999–2004—$31,398,337
Total Funding to Date—$37,102,539

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 2005—$8,437,795
Fiscal Years 2003–2004—$13,691,750
Total Funding to Date—$22,129,545

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

Feasibility of Retinoid Treatment in Emphysema (FORTE), Initiated in Fiscal Year 1999

The purpose of this program is to conduct preliminary studies to identify optimal patient populations, drugs and dosing schedules, and outcome measures before conducting a larger clinical trial on retinoid treatment for emphysema.

Obligations

Funding History:
Fiscal Year 2005—$185,012
Fiscal Years 1999–2004—$12,256,041
Total Funding to Date—$12,441,053

Current Active Organizations and Contract Numbers

1. University of Minnesota, Twin Cities
Minneapolis, Minnesota —HR-96140
2. Boston University
Boston, Massachusetts —HR-96141
3. University of Pittsburgh
Pittsburgh, Pennsylvania —HR-96142

4. University of California, Los Angeles
   Los Angeles, California —HR-96143
5. University of California, San Diego
   La Jolla, California —HR-96144
6. Columbia University
   New York, New York —HR-96145

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 2005—$3,486,226
Total Funding to Date—$3,486,226

Current Active Organizations and Contract Numbers

1. Mayo Clinic College of Medicine
   Rochester, Minnesota —HL-080274
2. Vanderbilt University
   Nashville, Tennessee —HL-080370
3. University of Michigan at Ann Arbor
   Ann Arbor, Michigan —HL-080371
4. Weill Medical College of Cornell University
   New York, New York —HL-080383
5. University of California, Los Angeles
   Los Angeles, California —HL-080411
6. Duke University
   Durham, North Carolina —HL-080413
7. University of Washington
   Seattle, Washington —HL-080509
8. Tulane University of Louisiana
   New Orleans, Louisiana —HL-080510
9. University of Chicago
   Chicago, Illinois —HL-080513
10. Emory University
    Atlanta Geogia —HL-080543
11. National Jewish Medical
    and Research Center
    Denver Colorado —HL-080571
12. University of California, San Francisco
    San Francisco, California —HL-080685

National Emphysema Treatment Trial (NETT), Initiated in Fiscal Year 1997

The NETT is a multicenter trial designed to evaluate the efficacy and role of lung volume reduction surgery (a procedure in which part of the lung is removed in an attempt to improve breathing) in the treatment of severe emphysema. If surgery proves to be effective, a major secondary objective is to determine which patients are most likely to benefit.

Obligations

Funding History:
Fiscal Year 2005—$357,270
Fiscal Years 1997–2004—$35,846,310
Total Funding to Date—$36,203,580

Current Active Organizations and Contract Numbers

1. Baylor College of Medicine
   Houston, Texas —HR-76101
2. Brigham and Women's Hospital
   Boston, Massachusetts —HR-76102
3. University of California, San Diego
   La Jolla, California —HR-76103
4. Cedars-Sinai Medical Center
   Los Angeles, California —HR-76104
5. Cleveland Clinic Foundation
   Cleveland, Ohio —HR-76105
6. Columbia University
   New York, New York —HR-76106
7. Duke University Medical Center
   Durham, North Carolina —HR-76107
8. University of Maryland
   Baltimore, Maryland —HR-76108
9. Mayo Foundation
   Rochester, Minnesota —HR-76109
10. University of Michigan at Ann Arbor
    Ann Arbor, Michigan —HR-76110
11. National Jewish Medical
    and Research Center
    Denver, Colorado —HR-76111
12. The Ohio State University
    Columbus, Ohio —HR-76112
13. University of Pennsylvania
    Philadelphia, Pennsylvania —HR-76113
14. University of Pittsburgh
    Pittsburgh, Pennsylvania —HR-76114
15. Saint Louis University
    St. Louis, Missouri —HR-76115
16. Temple University
    Philadelphia, Pennsylvania —HR-76116
17. University of Washington
    Seattle, Washington —HR-76118
18. Johns Hopkins University
    Baltimore, Maryland —HR-76119

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 2005—$6,459,743
Fiscal Years 2001–2004—$23,181,808
Total Funding to Date—$29,641,551

Current Active Organizations and Grant Numbers

1. University of Nebraska Medical Center
   Omaha, Nebraska —HL-069233
2. Fred Hutchinson Cancer Research Center
   Seattle, Washington —HL-069246
3. Dana Farber Cancer Institute
   Boston, Massachusetts —HL-069249
4. Children's Mercy Hospital
   Kansas City, Missouri —HL-069254
5. University of California, San Diego
   La Jolla, California —HL-069273
6. Duke University
   Durham, North Carolina —HL-069274
7. City of Hope Medical Center
   Duarte, California —HL-069278
8. University of Pennsylvania
   Philadelphia, Pennsylvania —HL-069286
9. University of Minnesota, Twin Cities
   Minneapolis, Minnesota —HL-069290
10. Stanford University
    Stanford, California —HL-069291
11. Medical College of Wisconsin
    Milwaukee, Wisconsin —HL-069294
12. University of Florida
    Gainesville, Florida —HL-069301
13. Johns Hopkins University
    Baltimore, Maryland —HL-069310
14. Sloan Kettering Institute for Cancer Research
    New York, New York —HL-069315
15. University of Michigan at Ann Arbor
    Ann Arbor, Michigan —HL-069330
16. Case Western Reserve University
    Cleveland, Ohio —HL-069348

Cord Blood Stem Cell Transplantation Study (COBLT), Initiated in Fiscal Year 1996

The purpose of this multicenter study is to determine whether umbilical cord blood stem cell transplants from unrelated, newborn donors are a safe and efficient alternative to bone marrow transplantation for children and adults with a variety of cancers, blood diseases, and genetic disorders.

Obligations

Funding History:
Fiscal Year 2005—$822,243
Fiscal Years 1996–2004—$32,406,365
Total Funding to Date—$33,228,608

Current Active Organizations and Contract Numbers

1. The EMMES Corporation
   Potomac, Maryland —HB-67132
2. Dana-Farber Cancer Institute
   Boston, Massachusetts —HB-67133
3. Fred Hutchinson Cancer Research Center
   Seattle, Washington —HB-67134
4. University of California, Los Angeles
   Los Angeles, California —HB-67135
5. Indiana University
   Indianapolis, Indiana —HB-67137
6. Duke University Medical Center
   Durham, North Carolina —HB-67138
7. University of Minnesota, Twin Cities
   Minneapolis, Minnesota —HB-67139
8. Duke University Medical Center
   Durham, North Carolina —HB-67141
9. University of California, Los Angeles
   Los Angeles, California —HB-67142

Multicenter Study of Hydroxyurea (MSH) in Sickle Cell Anemia Adult Follow-up, Initiated in Fiscal Year 1996

The purpose of this trial is to determine the long-term effects of hydroxurea. Patients were examined annually to determine their health status, quality of life, incidence of malignancies, and birth defects in their offspring(s). Mortality rates from this cohort were compared to mortality data from the CSSCD cohort and the normal black population mortality. Results showed that patients who took hydroxyurea over a 9-year period experienced a 40 percent reduction in deaths. Improved survival was related to benefits of drug therapy—an increase in fetal hemoglobin level and reduced episodes of severe pain "crises" and acute chest syndrome.

Obligations

Funding History:
Fiscal Year 2005—$1,340,090
Fiscal Years 1996–2004—$4,836,836
Total Funding to Date—$6,176,926

Current Active Organization and Contract Number

1. Maryland Medical Research Institute
Baltimore, Maryland —HB-67129

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 2005—$1,526,201
Fiscal Years 2000–2004—$8,187,198
Total Funding to Date—$9,713,399

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

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 2005—$2,729,989
Fiscal Years 2000–2004—$11,374,688
Total Funding to Date—$14,104,677

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 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 2005—$6,221,140
Fiscal Years 2002–2004—$18,386,476
Total Funding to Date—$24,607,616

Current Active Organizations and Grant Numbers

1. University of Iowa
Iowa City, Iowa —HL-072028

2. Case Western Reserve University
   Cleveland, Ohio —HL-072033
3. University of Minnesota, Twin Cities
   Minneapolis, Minnesota —HL-072072
4. Johns Hopkins University
   Baltimore, Maryland —HL-072191
5. Weill Medical College
   of Cornell University
   New York, New York —HL-072196
6. Emory University
   Atlanta, Georgia —HL-072248
7. New England Research Institutes, Inc.
   Watertown, Massachusetts —HL-072268
8. Tulane University of Louisiana
   New Orleans, Louisiana —HL-072274
9. University of Oklahoma
   Health Sciences Center
   Oklahoma City, Oklahoma —HL-072283
10. Duke University
    Durham, North Carolina —HL-072289
11. Blood Center of Southeastern Wisconsin
    Milwaukee, Wisconsin —HL-072290
12. Children's Hospital
    Boston, Massachusetts —HL-072291
13. Massachusetts General Hospital
    Boston, Massachusetts —HL-072299
14. Puget Sound Blood Center
    Seattle, Washington —HL-072305
15. University of Pittsburgh
    Pittsburgh, Pennsylvania —HL-072331
16. University of Pennsylvania
    Philadelphia, Pennsylvania —HL-072346
17. University of North Carolina
    at Chapel Hill
    Chapel Hill, North Carolina —HL-072355
18. University of Maryland
    Baltimore Professional School
    Baltimore, Maryland —HL-072359

Women's Health Initiative, Initiated in Fiscal Year 1992

The purpose of the WHI is to study cardiovascular disease, cancer, and osteoporosis in postmenopausal women. The program consists of three major components: a randomized controlled clinical trial of HRT, dietary modification, and calcium/vitamin D supplementation; an observational study to identify predictors of disease; and a study of community approaches to developing healthful behaviors.

Obligations

Funding History:
Fiscal Year 2005—$37,826,017
Fiscal Years 2000–2004*—$672,615,477
Total Funding to Date—$710,441,494

Current Active Organizations and Contract Numbers

1. Fred Hutchinson Cancer Research Center, Seattle, Washington —WH-22110
2. University of Medicine and Dentistry of New Jersey, Newark, New Jersey —WH-24152
3. Fred Hutchinson Cancer Research Center, Seattle, Washington —WH-32100
4. University of Minnesota, Twin Cities, Minneapolis, Minnesota —WH-32101
5. University of Iowa College of Medicine, Iowa City, Iowa —WH-32102
6. University of Alabama at Birmingham, Birmingham, Alabama —WH-32105
7. Wake Forest University, Winston-Salem, North Carolina —WH-32106
8. Northwestern University, Chicago, Illinois —WH-32108
9. Brigham and Women's Hospital, Boston, Massachusetts —WH-32109
10. University of Medicine and Dentistry of New Jersey, Newark, New Jersey —WH-32110
11. Emory University, Atlanta, Georgia —WH-32111
12. University of Pittsburgh, Pittsburgh, Pennsylvania —WH-32112
13. University of California, Davis, Davis, California —WH-32113
14. University of Arizona, Tucson, Arizona —WH-32115
15. University of Tennessee, Memphis, Tennessee —WH-32118
16. Memorial Hospital of Rhode Island, Pawtucket, Rhode Island —WH-32119
17. University of California, San Diego, La Jolla, California —WH-32120
18. State University of New York at Buffalo, Buffalo, New York —WH-32122
19. American College of Obstetricians and Gynecologists, Washington, DC —WH-34205
20. University of California, Irvine, Irvine, California —WH-42107
21. George Washington University, Washington, DC —WH-42108
22. Stanford University, Stanford, California —WH-42109
23. Baylor College of Medicine, Houston, Texas —WH-42110
24. University of Texas Health Science Center, San Antonio, Texas —WH-42111
25. Ohio State University, Columbus, Ohio —WH-42112
26. University of Nevada School of Medicine, Reno, Nevada —WH-42113
27. Kaiser Foundation Research Institute, Oakland, California —WH-42114
28. State University of New York at Stony Brook, Stony Brook, New York —WH-42115
29. University of Massachusetts Medical School, Worcester, Massachusetts —WH-42116
30. University of North Carolina at Chapel Hill, Chapel Hill, North Carolina —WH-42117
31. Wayne State University, Detroit, Michigan —WH-42118
32. Albert Einstein College of Medicine, New York, New York —WH-42119
33. Harbor-UCLA Research and Education Institute, Torrance, California —WH-42120

* This figure reflects funding for the clinical trials and observational studies only. From 1992–98, major support was provided through the Office of the Director, NIH. The Community Prevention Study receives funding through an interagency agreement with the CDC: $4,000,000 in FY 1999 and $12,000,000 from FY 1996–98.

34. Kaiser Foundation Research Institute
    Oakland, California —WH-42121
35. Medical College of Wisconsin
    Milwaukee, Wisconsin —WH-42122
36. Medlantic Research Institute
    Washington, DC —WH-42123
37. Rush-Presbyterian-St. Luke's
    Medical Center
    Chicago, Illinois —WH-42124
38. University of California, Los Angeles
    School of Medicine
    Los Angeles, California —WH-42125
39. University of Cincinnati
    Medical Center
    Cincinnati, Ohio —WH-42126
40. University of Florida
    College of Medicine
    Gainesville, Florida —WH-42129
41. University of Hawaii at Manoa
    Honolulu, Hawaii —WH-42130
42. University of Miami
    Miami, Florida —WH-42131
43. University of Wisconsin
    Madison, Wisconsin —WH-42132

12. Minority Activities

Throughout its history, the NHLBI has been a leader in conducting and supporting research to eliminate health disparities that exist between various segments of the U.S. population. The Institute has not only initiated research projects with significant minority participation in order to compare health status between various populations, but also given high priority to programs that focus exclusively on minority health issues.

Since FY 1991, the Institute has had procedures in place to ensure full compliance with the NIH Policy on Inclusion of Women and Minorities as Subjects in Clinical Research. As a result, all NHLBI-supported research that involves human subjects includes minorities, with the exception of a very few projects for which a compelling justification for limited diversity in the study population exists. Thus, all segments of the population, both minority and nonminority, stand to benefit from the Institute's research programs.

It has long been a goal of the NHLBI to increase the number of individuals from underrepresented groups in biomedical and behavioral research. Selected FY 2005 activities addressing this goal include the following:

- Minority K–12 Initiative for Teachers and Students (MKITS): Supports research, development, and evaluation of innovative science training programs to provide minority students in grades K–12 with the exposure, skills, and knowledge that will encourage them to pursue advanced studies in biomedical and behavioral sciences.
- Historically Black Colleges and Universities (HBCU) Research Scientist Award: Supports efforts by HBCU to recruit an established research scientist in cardiovascular, lung, or blood health and disease; transfusion medicine; or sleep disorders.
- Sickle Cell Scholars Program: Supports career development of young or new investigators in SCD research.
- Summer for Sickle Cell Science Program: Supports research training and mentoring of individuals from high school to junior investigator level as part of the Comprehensive Sickle Cell Centers program.
- Student National Medical Association Externship in Sickle Cell Disease: Supports an 8-week clinical rotation in SCD for third- and fourth-year medical students at an NHLBI-funded medical institution engaged in sickle cell research and patient care.
- 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.

The Office of Minority Health Affairs (OMHA) within the OD provides oversight for, and coordinates, supports, and evaluates Institute programs related to minority health outcomes, including research, research training and career development, public outreach, and translation of research findings. The OMHA also coordinates activities to foster greater participation of underrepresented minorities in NHLBI research and research training programs. Selected FY 2005 activities include the following:

- Issuing four training and career development RFAs to increase the number of highly trained minorities conducting biomedical and behavioral research. Additional targeted groups include individuals from underrepresented racial and ethnic groups or disadvantaged backgrounds or individuals with disabilities.
- Participating in HHS-Endorsed Minority Organization Internship Programs by providing positions in NHLBI extramural divisions to students from the National Association for

Equal Opportunity in Higher Education, the Hispanic Association of Colleges and Universities, and the Washington Internships for Native Students programs.
- Cosponsoring with the NIH, the Cherokee Elementary School Project: Out of the Box, which is designed to create awareness and interest in the importance of science, medicine, and health; eliminate gaps in quality of health among minorities by encouraging health-related careers; and encourage youngsters to take responsibility for their own health.
- Supporting the African American, Hispanic, and Native American Youth Initiatives to bring minority students to the NIH campus for scientific presentations, an introduction to NHLBI's research training and career development programs, and a tour of several NHLBI laboratories.
- Providing undergraduate students from the Tougaloo College Scholars program the opportunity to observe biomedical research at the NHLBI during a 3-day tour of the NIH that included learning about the NIH and available research training opportunities.
- Conducting a workshop on "Academic and Career Guidance" for Intramural Research Training Award (IRTA) students including the Biomedical Research Training Program for Underrepresented Groups to facilitate postbaccalaureate students to phase into biomedical research careers.

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.

Several investigator-initiated epidemiologic studies are examining gene–environment interactions that increase CVD risk factors among various racial groups. Included among them are studies that compare gene–environment interactions in black populations in Africa, the Caribbean, and selected areas of the United States; determine the genes responsible for the metabolic syndrome, a risk factor for CVD, in 10,000 Chinese sibling pairs; determine the genes responsible for CVD risk factor response to dietary fat changes in blacks; investigate genes influencing changes in blood pressure in response to high- and low-salt diets in a rural Chinese population; and identify and map specific genes that contribute to CVD risk in Mexican Americans.

Scientific evidence is emerging that implicates cellular and inflammatory processes in the development and characteristics of atherosclerotic plaque and the clinical

course of CVD. One study seeks to identify cellular, metabolic, and genomic correlates of atherosclerotic plaque characteristics and early changes in the vascular wall in a subset of the ARIC cohort that is predominately black. Another study is elucidating the links between socioeconomic factors, stress, inflammation and hemostasis, and cardiovascular risk in a large and diverse population-based sample.

Several drugs in four widely used classes of noncardiovascular medications (fluoroquinolone and macrolide antibiotics, antipsychotics, and antidepressants) have been shown to be pro-arrhythmic and thus increase the risk of sudden cardiac death. Investigators are conducting a study, using a large and comprehensive data set of about 800,000 people, 40 percent blacks, to understand the role of these medications on the risk of sudden cardiac death. Research findings will provide information that clinicians need to prescribe these widely used medications in a way that minimizes the risk of sudden cardiac death.

An ancillary study to MESA is seeking to determine whether impairment of myocardial perfusion reserve can serve as a marker of CHD. Scientists hypothesize that impaired myocardial perfusion reserve indicates the presence of subclinical coronary atherosclerosis and coronary microvascular disease. Developing a new measure of subclinical disease would enable early interventions and lifestyle modifications to prevent CHD. Fifty percent of the population will be Hispanic. Other ancillary studies to MESA are investigating progression of carotid atherosclerosis, association of risk factors with arteriosclerosis measured in retinal vessels, and the relationship of sex hormones to subclinical CVD and other risk factors in men and women.

The Institute is supporting additional epidemiologic investigations that include a study of Chagas' disease—a leading cause of heart disease throughout Latin America—to identify genetic determinants of susceptibility to infection and differential disease pathogenesis in a black population residing in rural Brazil; a project to use pooled data from nine existing U.S. studies to compare between blacks and whites, CHD incidence and mortality rates, exposure–outcome relationship, patterns of comorbidity, and population attributable risk; and a study to evaluate and compare the extent of atherosclerosis and risk factors for CHD in three different populations: U.S., Japanese American in Hawaii, and Japanese in Japan.

Treatment and Prevention

Low-dose aspirin is cost effective and efficacious for the prevention and treatment of CHD. However, some individuals, perhaps because of genetic variations across individuals, do not respond to the treatment. A genetic study in high-risk siblings of patients with premature CHD, along with their adult offspring, is seeking to determine whether low-dose aspirin responsiveness is heritable and whether it is associated with specific variations in candidate genes or defined haplotypes; 50 percent of the participants are black.

Many evidence-based guidelines for treatment of risk factors or disease have been developed, but they are often not adhered to by patients—especially minority populations—or adopted in routine clinical practice. The Institute has initiated the following activities to address this important problem:

- Trials Assessing Innovative Strategies To Improve Clinical Practice Through Guidelines in Heart, Lung, and Blood Diseases: To identify obstacles to implementing national evidence-based guidelines and test interventions to promote their use in clinical practice. Several approaches will be tested, including use of decision support tools; interactive seminars; Internet learning; a computerized patient activation tool placed in the waiting room of primary care offices; and performance feedback and practice profiling.
- 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. Studies are testing several approaches, such as telephone-based interventions, nurse case management and counseling, and patient and physician education intervention in clinical and community settings designed to overcome patient, provider, and medical systems barriers that impede treatment adherence. Urban and rural blacks, Hispanics, Asians, and women are the targeted groups.

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 disparities:

- Partnership Programs To Reduce Cardiovascular Disparities: To expand the capacity of research institutions to reduce health disparities, encourage more researchers to focus on minority health, and improve minority acceptance and community

willingness to participate in research by pairing research-intensive medical centers that have a track record of NIH-supported research and patient care with minority health care serving institutions that lack a strong research program. Research will focus on the complex biological, behavioral, and societal factors that result in cardiovascular health disparities in their target populations (e.g., blacks, Hispanics, Native Hawaiians, Pacific Islanders).

- Cultural Competence and Health Disparities Academic Award: To enhance the ability of physicians and other health care professionals to address disparities in the occurrence, management, and outcomes of cardiovascular, pulmonary, hematological, and sleep disorders among various population groups in the United States in a culturally sensitive manner. The award provides support to medical institutions in the United States to develop core curricula and other educational materials to increase the overall knowledge and skills of medical students, house staff, and other health professionals, including practicing physicians, on ethnic, cultural, religious, socioeconomic, linguistic, and other factors that contribute to health disparities, and on culturally competent approaches to mitigating them.
- Community-Responsive Interventions To Reduce Cardiovascular Risk in American Indians and Alaska Natives: To test the effectiveness of culturally appropriate behavioral interventions that promote adoption of healthy lifestyles related to heart disease and stroke risk, including healthy diet, regular physical activity, smoking cessation, and stress management in American Indians and Alaska Natives.

Education

The NHLBI, through its education programs (see Chapter 2), disseminates health information to physicians, health care professionals, patients, and the public on ways to prevent or treat diseases within the Institute's mandate. It has developed the following community-based programs to combat cardiovascular health disparities among four major cultural/ethnic groups: blacks, Hispanics, American Indians and Alaska Natives, and Asian Americans and Pacific Islanders.

- Public Health in Public Housing: Improving Health, Changing Lives: To disseminate to populations residing in public housing health information about improving cardiovascular health by adopting heart healthy lifestyles.
- Salud para su Corazón: To disseminate information on CVD prevention, intervention, and treatment and promote heart healthy behaviors in Hispanic communities through lay health educators (promotores model).
- NHLBI–Indian Health Service Partnership To Strengthen the Heartbeat of American Indian and Alaska Native Communities: To develop and initiate in three tribal communities effective approaches to improve cardiovascular health, including implementing tailored heart health strategies, and creating a national cardiovascular health training program, "Honoring the Gift of Heart Health," with the Indian Health Service.
- NHLBI Asian American and Pacific Islanders Heart Health Outreach Project: To develop culturally and linguistically appropriate outreach activities and information to increase community awareness of heart disease and its associated risk factors and to promote heart healthy lifestyles among a diverse Asian American and Pacific Islander population.

In addition to the activities mentioned above, the Institute has prepared publications on CVD prevention for minority populations. They include the following:

- *Improving Cardiovascular Health in African Americans—Package of Seven Easy-To-Read Booklets*
- *Heart-Healthy Home Cooking African American Style*
- Eight Easy-to-Read Booklets in Spanish and English on Heart Health
- *Bringing Heart Health to Latinos: A Guide for Building Community Programs*
- *Your Heart, Your Life: A Health Educator's Manual* for the Latino community
- *Filipinos Aspire for Healthy Hearts Fact Sheets* in Tagalog and English
- *Filipinos Take It To Heart: A How-To Guide for Bringing Heart Health to Your Community*
- *Vietnamese Aspire for Healthy Hearts Fact Sheets* in Vietnamese and English
- *Treat Your Heart to a Healthy Celebration* directed to American Indians and Alaskan Natives
- *Honoring the Gift of Heart Health: A Heart Health Educator's Manual for Native Americans.*

The educational materials listed throughout this chapter may be obtained from the NHLBI public Web site or through the NHLBI online catalog.

Arrhythmias

During the past decade, research studies have shown a lower incidence of atrial fibrillation in blacks compared to whites. However, the picture for ventricular fibrillation, a more lethal disturbance of heart rhythm, is far less sanguine. Blacks with ventricular fibrillation were less likely than whites to undergo electrophysiologic testing and, when discharged from the hospital, had higher mortality rates over the next year. In addition, blacks with out-of-hospital arrest suffered more ventricular arrhythmias than whites in every age group. Survival rates after cardiac arrest were 3.25 times greater for whites than blacks.

The NHLBI is supporting basic and genetic research on cardiac arrhythmias to elucidate the mechanisms involved in control of heart beat/rhythm and to develop improved therapies for all ethnic/racial groups in the United States. One research group has found a gene variant in blacks that produces a small increase in risk of arrhythmia. In combination with certain medications, low blood potassium levels, or structural heart disease, such a gene variant might further magnify the risk of life-threatening arrhythmias. Another group is studying selected genes and their variants that are likely candidates for modulating cardiac rhythm, may contribute to variations in response to drug treatment of atrial fibrillation, and may alter healthy heart rhythm patterns.

High Blood Pressure

Etiology and Pathophysiology

High blood pressure is a serious health problem that is especially prevalent and severe among minorities. Institute-initiated studies addressing the etiology and pathophysiology of high blood pressure include:

- Molecular Genetics of Hypertension (see Chapter 9): To determine the etiology and pathogenesis of hypertension and its complications in order to improve diagnosis and treatment. Many of the subprojects have a high percentage of minority participation; others target blacks or Hispanics exclusively.
- Family Blood Pressure Program (see Chapter 9): To use a network of investigators to identify genes associated with high blood pressure and to examine interactions between genetic and environmental determinants of hypertension in specific minority populations: blacks, Mexican Americans, and Asians.

The NHLBI supports a number of investigator-initiated studies to identify genes linked to hypertension in blacks, Mexican Americans, and whites to determine if part of the disparity in prevalence can be attributed to genetic differences among the groups. Genes under investigation include those associated with the renin-angiotensin system, the autonomic nervous system, and sodium transport.

The Institute supports a number of projects to examine antecedents of hypertension in children to determine racial differences in blood pressure regulation. One study is determining relationships between cardiovascular reactivity in adolescent normotensive blacks and development of pathobiologic markers of hypertension risk (i.e., increased resting blood pressure, left ventricular mass, and relative wall thickness) later in life. Another is investigating the genetics of cardiovascular reactivity following stress in black youths.

Researchers also are examining the influence of SES and ethnic discrimination on stress reactivity to determine if it provides a pathophysiologic link to CVD in blacks. One group is examining the combined influence of low SES and ethnicity on development of behavioral risk factors (i.e., hostility, anxiety, and heightened cardiovascular reactivity to stress) in a group of adolescents; 50 percent of them are black. Another group is assessing the relationship between early life exposure to socioeconomic stressors, such as adverse socioeconomic conditions, low levels of social integration, and racial discrimination, and development of hypertension in blacks.

Investigators have observed that blacks have an augmented blood pressure response to salt. A study to improve understanding of the genetic basis and phenotypic characterization of salt-sensitive hypertension in blacks has located a specific region of the kidney where sodium is reabsorbed more extensively in blacks than in whites.

Impaired sodium regulation also appears to be linked to the development of hypertension. Scientists are investigating the effects of stress on salt retention and measuring hormonal variables known to influence sodium

regulation. One study is seeking to determine whether the mechanisms regulating sodium retention differ between blacks and whites. Researchers found that black youths have a slower salt excretion rate in response to stress than white youths. Another study is examining the role of sodium and obesity in hypertension development among blacks living in three different environments: Nigeria, Jamaica, and Chicago. In a twin study consisting of 41 percent blacks, scientists are investigating sodium retention as a mechanism augmenting systemic vascular resistance and changes in vascular function, ventricular structure, and blood presssure.

The role of dietary factors, particularly macronutrients, in the etiology of high blood pressure is another area of investigation. Scientists are conducting epidemiologic studies among participants with diverse ethnicity, SES, and dietary habits in four countries to determine the impact of selected dietary components (proteins, lipids, carbohydrates, amino acids, calcium, magnesium, sodium, potassium, antioxidants, fiber, and caffeine) on blood pressure. Another study is seeking to identify the link between healthy diet, genetic factors, and their underlying biological mechanisms.

Treatment and Prevention

Identifying effective treatment strategies for various populations requires large-scale studies with representative populations in sufficient numbers.

- ALLHAT (see Chapter 11): To compare the combined incidence of fatal CHD and nonfatal MI among patients receiving ACE inhibitors, calcium antagonists, or alpha-1 blockers and patients in a control group receiving a diuretic. Also, in a subset of these groups, to determine whether cholesterol-lowering therapy reduces mortality in moderately hypercholesterolemic individuals compared with a control group; 32 percent of the participants are black and 19 percent are Hispanic. Research findings demonstrated that the less expensive traditional diuretics work better than newer medicines in treating high blood pressure and preventing some forms of heart disease and should be preferred as a first therapy for most patients with high blood pressure.
- 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 lack of response to therapy. Three of the studies focus on antihypertensive drugs and include 50 to 58 percent blacks.

Although it is well known that reducing hypertension will reduce CVD rates, the implementation of evidence-based guidelines for hypertension treatment in clinical practice is not very high. To address this issue, the NHLBI initiated a program to improve hypertension control rates in blacks, a group with the highest prevalence and earliest onset of hypertension and with a disparately high premature cardiovascular mortality and morbidity:

- Interventions To Improve Hypertension Control Rates in African Americans: To evaluate the feasibility of clinical interventions directed at the medical care delivery system to increase the proportion of blacks who have their blood pressure controlled to levels specified by the JNC VII guidelines.

Understanding racial differences in blood pressure control is an area of major interest for the Institute. Scientists are examining whether variations in genes of the renin-angiotensin-aldosterone system predict differences in blood pressure response to diuretic therapy among hypertensive blacks and whites. Research also is being focused on variations in the ACE gene between blacks and whites to explain racial differences in the antihypertensive responsiveness to ACE inhibitors.

The Institute supports a number of investigator-initiated studies to evaluate various interventions to improve hypertension management. One study is testing the effectiveness of a two-staged intervention involving telemonitoring of blood pressure and telephone-based nurse care management in 12 community-based clinics that serve economically disadvantaged, largely black and Hispanic populations. Another study is evaluating two interventions compared to usual care (regular primary care clinic visits) in blacks with hypertension who have several risk factors (smoking, sedentary lifestyle, and high sodium intake) for CVD. The interventions include the following: (1) simultaneous intervention (smoking cession, increased exercise, and decreased salt intake) in

a clinical session, with stage-specific telephone support and follow-up and (2) sequential intervention of each targeted behavior presented individually at a clinic session, with stage-specific telephone support and follow-up.

Anger and hostility have been demonstrated as risk factors for hypertension. Scientists are evaluating an anger management intervention in a hospital setting with 46 percent blacks to determine if it will lead to improved blood pressure and psychosocial risk factors (e.g., reduce depression).

Education

The NHLBI (see Chapter 2) has developed a number of outreach activities to inform minority populations of the importance of blood pressure control. Included among them are a toll-free number that provides materials on hypertension in English or Spanish; mini telenovelas (Más vale prevenir que lamentar), "health moments" to reinforce CVD prevention for local Spanish-language television stations; a Spanish version of the High Blood Pressure Education Month Kit; and several publications for health professionals, patients, and the public. Below are some examples:

- *Sí se Puede: Prevenir y Controlar la Presión Arterial Alta con Actividad Física*
- *Plan de Alimentación Saludable Contra la Hipertensión: Prevenir y Controlar la Presión Arterial Alta Siguiendo el Plan de Alimentación Conocida Como DASH*
- *Sí se Puede: Prevenir y Controlar la Presión Arterial Alta. Lo Que Usted Debe Saber Sobre la Prevention y Control de la Presión Arterial Alta*
- *Sí se Puede: Prevenir y Controlar la Presión Arterial Alta. Lo Que los Médicos Deben Saber*
- *Take Steps To Prevent High Blood Pressure* in English and Spanish
- *Cut Down on Salt and Sodium* in English and Spanish
- *Churches as an Avenue to High Blood Pressure Control*
- *Working With Religious Congregations: A Guide for Health Professionals*
- *Protect Your Heart! Prevent High Blood Pressure*
- *Spice Up Your Life! Eat Less Salt and Sodium*
- *Keep the Harmony Within You—Check Your Blood Pressure*
- *Keep Your Heart in Check—Know Your Blood Pressure Number* in Tagalog and English and in Vietnamese and English
- *Prevent and Control High Blood Pressure: Mission Possible.*

NHBPEP Coordinating Committee Activities

Member organizations of the NHBPEP coordinating committee have continuing education programs on the prevention and treatment of hypertension that are focused on their minority members. They also support hypertension prevention and awareness in community-based settings such as screening and church activities, community awareness campaigns, and media events.

High Serum Cholesterol

Etiology

The Institute supports a number of investigator-initiated projects to identify genes that influence the lipoprotein profile within various racial and ethnic groups. Research findings could offer an explanation for differences in susceptibility to CHD found between various racial and ethnic groups.

Variation in hepatic lipase activity is associated with differences in plasma concentrations of HDL and LDL synthesis and catabolism. Researchers are investigating whether ethnic differences in hepatic lipase activity are responsible for the well-known differences in plasma HDL concentrations found in blacks and whites. Genetic studies are being conducted on a population that is 39 percent black.

Prevention

The NHLBI is supporting an investigator-initiated study among minority preschool children to track the long-term effectiveness of nutrition interventions on blood cholesterol and diet. Additional potential risk factors, such as increased blood pressure, obesity, and intention to smoke, will also be monitored.

Education

The NCEP (see Chapter 2) has prepared the following publications on blood cholesterol for minority audiences.

- *Learn Your Cholesterol Number* in Spanish and English
- *Protect Your Heart—Lower Your Blood Cholesterol* in Spanish and English

- *Heart-Healthy Home Cooking African American Style*
- *Delicious Heart-Healthy Latino Recipes*
- *Cut Down on Fat—Not on Taste* in Spanish and English
- *Empower Yourself! Learn Your Cholesterol Number*
- *Be Heart Smart! Eat Foods Lower in Saturated Fats and Cholesterol*
- *American Indian and Alaska Native People: Treat Your Heart to a Healthy Celebration*
- *Serve Up a Healthy Life—Give the Gift of Good Nutrition* in Tagalog and English, and in Vietnamese and English.

Obesity

Etiology

The latest NHANES data show a continued rise in the proportion of Americans who are overweight; black women are especially at risk. To understand the reasons for the racial disparity among women, the Institute initiated a long-term program, the NHLBI Growth and Health Study (NGHS), to examine the development of obesity and CVD risk factors in a biracial cohort of young girls. The study, which ended in FY 2000, found black girls consumed more calories and a higher percentage of calories from fat and watched more television than white girls. An investigator-initiated study using the NGHS cohort, starting at ages 18 to 19 years, is examining the changes in cardiac output and total peripheral resistance that occur with developing obesity and their influence on ethnic difference in blood pressure regulation. Another project, using data from the NGHS, is examining CHD risk factors in black and white girls to identify genes involved in black–white differences in lipid metabolism and obesity.

Black women have been shown to manifest lower resting energy expenditure than white women. Scientists seeking to improve our understanding of ethnicity, genetics, energy metabolism, and obesity development will examine the relationship between two genes implicated in energy metabolism and resting energy expenditure in high-risk blacks.

Menopause-related coronary risk was previously believed to be associated with a gain in total body fat. Research, however, suggests that the location of the fat, not the total fat per se, is the key risk factor. An investigator-initiated study is seeking to determine if indices of central adiposity, particularly intra-abdominal fat, predict coronary events better than indices of total fat. The study is also examining the role of central adiposity with altered glucose and lipid metabolism and elevated blood pressure; 48 percent of the population is black.

Treatment and Prevention

The NHLBI has initiated several programs to treat or prevent obesity.

- Overweight and Obesity Control at Worksites: To test innovative interventions that emphasize environmental approaches or the combination of environmetal 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).
- POUND LOST (see Chapter 9): To evaluate the effectiveness of four diets differing in macronutrient composition to promote and sustain weight loss in overweight and obese individuals; approximately 25 percent of the participants will be black.
- Primordial Prevention of Overweight in American Indian Children (see Chapter 9): To prevent American Indian children from becoming overweight at an early age. Culturally appropriate interventions, including family counseling to improve nutrition and physical activity in infants and toddlers, will be developed and introduced community-wide.
- WLM (see Chapter 9): To determine the effectiveness of continuous patient contact on weight loss maintenance in adults who recently lost weight; 40 percent of the patients are black.

The Institute supports a number of investigator-initiated studies on the effectiveness of obesity prevention and control interventions among diverse populations. One study is testing the effectiveness of weight-control interventions (involving diet, physical activity, and psychosocial and familial influences) administered during the critical transition period from prepuberty to puberty in black girls at high risk for obesity. Two studies are evaluating the effectiveness of weight control programs to prevent weight gain in a predominately black population that has recently completed a smoking cessation program. The blood pressure status of the participants, who are prehypertensive or hypertensive at the beginning of the studies, will be monitored.

Hispanic parents and children are participating in a program that targets physical activity and dietary behaviors in a microenvironment (i.e., home environment) and in a macroenvironment (i.e., apartment complex, schools, grocery stores, parks, 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 (1) a study to test the efficacy of an after-school dance program and (2) 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 American Indian 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 American Indian children. A project with a subject population consisting of Asians, Hispanics, and whites is testing an integrated school- and community-based intervention involving physical activity and diet to reduce the prevalence of obesity.

Blacks at high risk of CVD often have limited success in weight loss and lifestyle change programs. A study was initiated to examine the role of social support, particularly from family members and friends, to facilitate weight loss and related dietary and physical activity changes in blacks.

Education

The NHLBI OEI (see Chapter 2) has prepared health information on losing excess weight for minorities.

- *Watch Your Weight* in English and Spanish
- *Embrace Your Health! Lose Weight if You Are Overweight*.

Physical Inactivity

The Institute has initiated research on the effectiveness of an intervention program to encourage greater physical activity among adolescent girls.

- TAAG (see Chapter 11): To test the effectiveness of school–community-linked interventions to reduce the decline in physical activity in adolescent girls, from grades 6 through 8. As estimated 5,000 girls, approximately 50 percent minority, from 36 schools are participating.

The NHLBI supports several investigator-initiated studies on strategies to increase physical activity among minority populations. Included among them are studies to examine the effect of vigorous exercise on reduction of childhood obesity in black girls. A school-based study is evaluating the effects of vigorous exercise programs on decreasing the accretion of general and visceral adiposity in black girls.

An ancillary study to an Institute-initiated program to reduce the decline in physical activity in adolescent girls (TAAG) is investigating the influence of community characteristics (e.g., street design, access to public transportation, facilities for physical activity, population mix, socioeconomic mix of the neighborhood) on physical activity levels and body mass index; approximately 50 percent of the girls are minority. Two other studies are seeking to determine the factors that lead to decline in physical activity in adolescent girls. They include the effects of previous exposure to physical activity intervention, race and ethnicity, weight, psychosocial influences, and the environment.

Physical inactivity among children is often attributed to the lack of open space, lack of recreational equipment, and fear by parents for the safety of children playing outdoors. A study is being conducted to determine if an intervention that changes these neighborhood features in a low-income, inner-city neighborhood will increase physical activity in children.

Scientists have observed an age-related decline in aerobic capacity, but have not been able to discern the effects of physical activity, body fat, and genetic variation on its rate of change. They also have little understanding about how the rate of change in aerobic capacity during early and middle adulthood affects CVD development. An ancillary, investigator-initiated study being conducted in conjunction with the Year 20 CARDIA examination is addressing these issues. Data from this study should increase understanding of the interrelationships of cardiorespiratory fitness, body composition, and CVD-related risk factors and endpoints, and may provide the basis for more extensive evidence-based recommendations on the role of fitness in cardiovascular health; 46 percent of the participants are black.

Education

The Institute has prepared the following publications for minorities on the importance of physical activity and ways to become more physically active.

- *Stay Active and Feel Better* in English and Spanish
- *Energize Yourself! Stay Physically Active*

- *American Indian and Alaska Native People: Be Active for Your Heart!*
- *Be Active for a Healthy Heart* in Tagalog and English
- *Be Active for a Healthier Heart* in Vietnamese and English.

The Institute also has developed a Web-based application on physical activity for lay health educators in English and Spanish, which can be found at http://hin.nhlbi.nih.gov/salud/pa/index.htm.

Smoking

Smoking among minorities has increased significantly compared with whites. To determine the causes of the increase, the Institute is supporting an investigator-initiated study in a predominately minority population to examine factors that prompt them to initiate smoking. In addition, the study seeks to identify predictors of cessation.

The Institute is also supporting a number of studies of smoking intervention and follow-up cessation maintenance that specifically target minorities. Two studies are evaluating the effectiveness of smoking cessation programs for smokers who seek treatment at the hospital emergency department. One study involves patients who suffer from acute respiratory illness; approximately 35 percent are minorities. The other targets Chinese American patients hospitalized with CVD, pulmonary disease, or diabetes mellitus. A third study is seeking to determine if the addition of a physical activity intervention improves smoking cessation; 45 percent of the participants are blacks.

Two types of pharmacologic therapies (nicotine replacement therapy and sustained-release bupropion) have been approved by the FDA for smoking cessation in the United States. Scientists are comparing the ability of each drug alone or in combination to increase initial and long-term smoking cessation rates in young low-income and minority smokers. Another study is evaluating the efficacy of a weight loss drug intervention to prevent weight gain in obese individuals participating in a smoking cessation program; 44 percent of the participants are black.

Education

The Institute has prepared the following publications on smoking cessation for minorities.

- *Kick the Smoking Habit* in English and Spanish
- *Refresh Yourself! Stop Smoking*
- A*merican Indian and Alaska Native People: Help Your Heart*
- *Don't Burn Your Life Away—Be Good to Your Heart* in Tagalog and English and in Vietnamese and English.

Psychosocial Factors

Major depression is a risk factor in the development of ischemic heart disease and for death after an acute MI. Investigator-initiated research is seeking to determine the pathways that link depression to physiological mechanisms in post-MI patients. One study is examining the link between the severity of depressive symptoms to the inflammatory process implicated in atherogenesis by focusing on the basal expression of cytokines and cell adhesion molecules on blood monocytes. Another is focused on the autonomic nervous system and its link to depression. A third study is investigating the role of platelets, platelet aggregation, and adhesion in patients with major depression. Approximately a third of the population in the studies is black.

The NHLBI is interested in the effect of depression, anxiety, and lack of social support on prognosis after a CHD event. An investigator-initiated study is examining the efficacy of individual and group therapy in post-MI patients who are socially isolated or clincally depressed. Scientists will be measuring biological risk factors (e.g., lipids, adiposity, coagulation factors) and possible subclinical markers of disease (e.g. carotid intima-media thickness, coronary calcification); 34 percent of the participants are black.

The Institute supports investigator-initiated research on the role of race and ethnicity, psychosocial and environmental factors, and low SES in the development of CHD. Scientists are investigating the contribution of biobehavioral factors (hostility, anxiety, and heightened cardiovascular reactivity to stress) in the etiology, pathogenesis, and course of CHD. Racial differences in stress-induced physiologic responses also are being examined. Other investigators are focused on the relationships of psychosocial stress, sleep disordered breathing, and nocturnal physiological measures with emerging risk factors and subclinical CVD; 50 percent of the participants are black.

Investigators are interested in the effects of race and psychosocial factors, such as hostility, on glucose metabolism. A study was initiated to determine how hostility is differentially related to glucose metabolism in blacks and whites. Research findings may increase

understanding of the differences in the etiology of diabetes in the two groups.

Additional areas of interest include the genetic basis of aggression and the relationships between risk-promoting variables (psychosocial stress, smoking, poor diet, physical inactivity); presumed mediating variables (sympathetic nervous system activity and insulin metabolism); and CHD risk factors. Fifty to sixty percent of the participants are black or Hispanic.

Diabetes

Diabetes mellitus is a strong risk factor for CVD. Its prevalence is increasing due to the significant increase of obesity and physical inactivity in the population, especially among blacks, Hispanics, and American Indians. To address this growing problem, the Institute is supporting an investigator-initiated study on defining the relationship between the overall dose of endurance exercise training and the corresponding response of metabolic risk factors in an overweight and obese biracial female population. Another study will determine if adolescents with type 2 diabetes have a high risk of developing clinical CVD in their late 20s or 30s. Scientists are using noninvasive imaging techniques for detecting subclinical atherosclerosis to measure CVD development in a predominatly black population.

Hypertension and diabetes are major contributors to CVD and occur disproportionately in blacks. In particular, black women seem to have earlier disease onset and poorer outcomes. Scientists are investigating the link between hypertension and type 2 diabetes and the relative excess of androgen found in black women to determine whether insulin resistance, excess androgen, and endothelial dysfunction contribute to accelerated vascular injury in blacks.

Treatment

The NHLBI supports clinical trials to determine the benefits of various strategies to reduce CVD among patients with diabetes or treat patients with coronary artery disease and diabetes.

- ACCORD (see Chapter 11): To evaluate the benefits of different therapies to reduce CVD in type 2 diabetes; more than one-third of the participants are minorities.
- BARI 2D (see Chapter 9): To evaluate whether urgent revascularization offers an advantage over medical therapy in patients with coronary artery disease and diabetes. In addition, for a given level of glycemic control, to determine whether insulin-providing drugs offer advantages or risks compared to insulin sensitizers (drugs that enhance insulin action); 33 percent of the participants are from minority populations.
- SANDS (see Chapter 9): To compare intensive treatment (pharmacologic agents, such as ACE inhibitors and simvastatin for high blood pressure and LDL cholesterol) to conventional treatment in 488 American Indians with diabetes, ages 40 or older. The primary outcome measure is change in carotid intimal-medial thickness.

An investigator-initiated study will evaluate the effectiveness of a multiple risk factor intervention (diet, exercise, stress management, social support, smoking cessation) targeting postmenopausal Hispanic women with type 2 diabetes.

Lung Diseases

The NHLBI supports research on a number of lung diseases, such as asthma, sarcoidosis, and TB, which disproportionately affect minorities. The following section provides examples of research to address health disparities in lung diseases.

Asthma

Etiology and Pathophysiology

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

- Cellular and Molecular Mechanisms of Asthma (see Chapter 9): To delineate the cellular and molecular mechanisms underlying acute and chronic asthma through basic and clinical investigations.
- Severe Asthma Research Program: To determine the mechanistic basis for severe asthma and to determine how it differs from mild-to-moderate asthma. Several of the projects have strong minority participation.
- Asthma Exacerbation: Biology and Disease Progression: To elucidate the biologic mechanisms of asthma exacerbation pathobiology and resolution and to determine their effect on lung function, physiology, and disease state; 27 to 56 percent of the study participants will come from various minority populations.

The Institute also supports investigator-initiated projects on the etiology and pathophysiology of asthma. One study is using genomic screening to search for the genetic basis of asthma in a homogeneous Hispanic population in Costa Rica; another study is seeking to identify positional gene candidates for airway hyperresponsiveness and compare their association with asthma between two asthmatic groups: a white population on Tangier Island, VA, and a black population from Barbados; and a third study seeks to establish the link between specific genotypic variants and phenotypic markers, and to elucidate the immunological pathways that contribute to asthma severity in blacks from Harlem.

Latinos carry a disproportionate burden of asthma, yet few investigators studying the genetics of asthma have focused on this group, partly due to the complexity of the Latino gene pool. A recently initiated study is developing and testing new methods to correct for population stratification due to racial admixture, a key problem confounding genetic studies in the Latino population. The project focuses on data from the NHLBI-supported Genetics of Asthma in Latino Americans (GALA) to assess population stratification.

Occupational and environmental factors are known to trigger asthma symptoms. An investigator-initiated study is focusing on understanding the mechanisms by which occupational or environmental factors trigger the onset of asthma among low-income, urban blacks and Hispanics. Another study is examining the association of early exposure to endotoxin (which appears to promote the development of the immune system), nitrogen dioxide, and aeroallergens (which trigger asthma exacerbations); obesity; physical inactivity; and environmental tobacco smoke on the prevalence, persistence, and incidence of asthma in black and Hispanic children enrolled in inner-city Head Start programs.

Circadian change in airway function is an important aspect of asthma, as more than 70 percent of deaths and 80 percent of respiratory arrests occur during sleep. Forcusing on nocturnal asthma, researchers are investigating the mechanisms that cause the changes in airway function that lead to exacerbation of symptoms; 36 percent of the population is minority.

Treatment and Control

The Institute has initiated research to identify optimal drug strategies for treatment and management of asthma. Because the burden of asthma disproportionately affects minority children, it is important for them to be well represented in clinical trials.

- ACRN (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, 37 percent of the participants are from minority populations.
- CAMP (see Chapter 11): To determine whether inhaled corticosteroids are safe and effective for long-term treatment of children with mild-to-moderate asthma. The therapy proved more effective than nonsteroidal anti-inflammatory medication and significantly reduced airway hyperresponsiveness. The only side effect was a transient slowing in growth rate during the first year of treatment; 31 percent of the participants were minorities.
- CARE (see Chapter 11): To support a network of pediatric clinical care centers to determine optimal treatment and management strategies for children with asthma. The studies considered by the network will attempt to customize therapy based on specific asthma phenotypes and genotypes; 30 percent of the population will be minorities.
- Centers for Reducing Asthma Disparities (see Chapter 9): To support partnerships between minority-serving institutions and research-intensive institutions to conduct studies on causes of and corrections for disparities in asthma among racial/ethnic and low SES populations. Reciprocal training is encouraged to ensure culturally sensitive projects and enhance research capabilities.

The Institute is also supporting investigator-initiated studies focusing on finding effective treatment for various populations. One study is examining the effect of steroids on enhanced alpha-adrenergic vascular responsiveness in asthma; 77 percent of the participants are minority. Another study is using preexisting, well-characterized asthma patient cohorts to identify genetic variants that can predict therapeutic response to asthma drugs. Scientists are interested in the influence of race/ethnicity on the genetic factors associated with asthma therapeutic responses.

Translational Activities

Ensuring full use of modern asthma treatment strategies is an important goal of the NHLBI. The Institute is supporting an investigator-initiated study to determine the effectiveness of an intervention that is removing barriers to preventive care to improve asthma management and lower asthma morbidity. Scientists are using a Breathmobile to deliver asthma screening to black children attending Head Start Programs and a special consultation service to communicate directly with the parents about asthma management. Another study among low-income, inner-city children with asthma attending preschool is testing a bilingual intervention program to improve asthma management; 60 percent of the participants are Hispanic and 40 percent are black.

Additional studies to improve asthma management among minority groups include a study to determine whether shared decision making in choosing asthma therapy between patients and physicians improves adherence in a patient population consisting of 82 percent minorities and a study to test whether individualized interventions will improve asthma management in a black and Hispanic population. A third study seeks to improve asthma management by teaching children with asthma to recognize symptoms of the presence of airflow obstruction; 42 percent of the participants are black and 6 percent are Hispanic.

Two randomized controlled trials are being conducted among patients recruited at the time of an emergency department visit for asthma exacerbation. One study is testing an intervention to enhance knowledge, self-efficacy, and asthma-related social support; 40 percent of the patients are minority. The other focuses on young black children recruited at the time of an emergency department visit for asthma exacerbation. Investigators are testing the effectiveness of an intervention strategy that includes case management, telephone contacts, and a monetary incentive to increase follow-up visits to primary care providers.

Three studies are evaluating the benefits of working with public school systems to improve adherence to asthma management. In Birmingham, scientists are evaluating the impact of school-based supervised asthma therapy on asthma exacerbations in a predominately black population with moderate-to-severe asthma. In New York, they are testing the ability of an intervention that includes in-school intensive asthma education to 9th- and 10th-grade students who have persistent asthma and intensive asthma education for their community physicians to improve asthma morbidity; 90 percent of the participants are black. In Detroit, investigators are developing and evaluating computer-based instructions and peer counseling for black teens with asthma.

Chronic environmental tobacco smoke exposure, particularly from parental smoking, is associated with more severe asthma, increased incidence of emergency department visits, life-threatening attacks, and prolonged time to recovery from asthma exacerbation requiring hospitalization. A study is being conducted to evaluate an intervention tailored to parental stage of change regarding smoking practice, to reduce asthma crisis care used by children with persistent asthma.

Education

The NAEPP (see Chapter 2) has developed easy-to-read materials on asthma treatment and control directed to audiences with low literacy.

- *Facts About Controlling Your Asthma*
- *El asma: Cómo Controlar Esta Enfermedad.*

Sarcoidosis

Sarcoidosis is an inflammatory disease of unknown etiology characterized by persistent granulomas with damage to surrounding tissue. The Institute has initiated a program to determine the immunopathogenesis of granulomatous inflammation found in sarcoidosis, including the role of predisposing factors, the immune components involved in the formation of granulomas, and the defective regulatory immune response.

Investigator-initiated studies on the causes of sarcoidosis include a study to identify genes linked to sarcoidosis susceptibility in blacks and to determine if hereditary susceptibility predisposes blacks to sarcoidosis, and a project to elucidate the mechanisms involved in the immunologic and inflammatory processes that ultimately lead to end-stage fibrosis in progressive pulmonary sarcoidosis; 50 percent of the participants are black.

Sleep Disorders

Etiology

Sleep apnea is a common disorder that disproportionately affects blacks and is associated with an increase risk of CVD; it is particularly prevalent in heart failure patients. An Institute-initiated program is assessing the interrelationship between sleep disorders and heart failure, and the mechanisms leading to cardiovascular stress when the two interact.

The NHLBI supports research on the etiology, pathophysiology, and consequences of sleep-disordered breathing (SDB), a condition characterized by repetitive interruptions in breathing.

- Neurobiology of Sleep and Sleep Apnea (see Chapter 9): To integrate molecular, cellular, and genetic approaches to sleep control with clinical investigation on the etiology and pathogenesis of sleep disorders, particularly sleep apnea. One study has 39 percent minority participation.
- Sleep Heart Health Study (see Chapter 9): To determine the degree to which sleep apnea is an independent or contributing risk factor for the develop of cardiovascular or cerebrovascular disease; 23 percent of the participants are from various minority and ethnic populations.

The Institute also supports a wide spectrum of investigator-initiated projects to elucidate cardiovascular and other health consequences of SDB. Ongoing studies in various community settings are assessing the health risks of SDB within specific ethnic populations, including blacks, Hispanics, Asians, and American Indians. A study of sleep in black families will investigate whether sleep problems contribute to diabetes, and the potential relationship to CVD. Characterization of how SDB occurs within family groups is helping to identify potential genetic risk factors that may allow early identification and treatment of high-risk individuals. A community-based study of sleep in Hispanics is assessing the prevalence and awarenesss of sleep disorders.

Treatment and Control

The NHLBI has initiated a multisite clinical trial to find effective treatments for sleep apnea.

- APPLES (see Chapter 11): To determine whether continuous positive airway pressure is an effective treatment for excessive daytime sleepiness and cognitive impairment associated with moderate-to-severe SDB; 30 percent of the participants are minority.

An investigator-initiated study will assess the impact of continuous positive airway pressure on functional outcomes in milder obstructive sleep apnea. The minority participation at U.S. sites is 46 percent, but is 13 percent of the total minority participation when Canadian sites are included.

Tuberculosis

Etiology

The Institute has initiated genetic studies to characterize genes associated with TB susceptibility and host immune responses to infection.

- Genetic Aspects of Tuberculosis in the Lung: To identify genes or families of genes that determine resistance and susceptibility to mycobacterial infection, virulence, latency, reactivation of TB, and resistance to antituberculous drugs. A large number of the participants being recruited are from minority populations.

Treatment and Control

The NHLBI supports a number of investigator-initiated studies focused on understanding the relationship of the immune system to TB. Most of the patients are from minority populations with HIV. One group is seeking to identify the correlates of protective immunity in a Mexican American population in order to aid development of anti-TB vaccines. Another group is conducting a Phase I safety trial on a vaccine with a patient population consisting of 85 percent minorities. A third group is examining the role of interferon-gamma in the pathogenesis of TB among Hispanics with and without HIV. A fourth group is identifying and characterizing host factors that predispose Asians to develop TB. In predominately minority populations in the United States, a new study will compare the effectiveness of adding aerosolized interferon-gamma to the usual treatment regimen for advanced TB.

The NHLBI also supports research to improve TB control among minority populations. One project is evaluating educational strategies to improve adherence to medication regimens and regular clinic visits among Hispanic adolescents infected with TB. Another study, located in the Harlem community of New York City, is testing a new strategy to promote adherence to therapy among inner-city TB patients. Both programs are outgrowths of behavioral research programs begun by the Institute in 1995.

Education

Building on the foundation laid by the Tuberculosis Academic Award program, the NHLBI is supporting a consortium of five TB curriculum centers.

- TB Curriculum Coordinating Center: To strengthen, expand, and increase access to the best ongoing educational and training opportunities in TB for medical, nursing, and allied health schools, especially those that provide primary care to communities where TB is endemic and the population is at high risk of developing TB.

Blood Diseases

The NHLBI supports basic and clinical research on SCD and Cooley's anemia with the goal of curing the disorders or improving patient care.

Sickle Cell Disease

Basic Research

SCD is an inherited blood disorder that produces chronic anemia, periodic episodes of pain, and end organ damage. It affects about 1 in 500 blacks and 1 in 1,000 Hispanics. Since 1972, the NHLBI has supported an extensive research program to improve understanding of the pathophysiology of SCD and identify better approaches for its diagnosis and treatment and for prevention of complications.

- Comprehensive Sickle Cell Centers Program (see Chapter 9): To provide a multidisciplinary and multilevel research approach to expedite development and application of new knowledge into improved diagnosis and treatment of SCD and prevention of its complications.
- Reference Laboratory To Evaluate Therapies for SCD (see Chapter 9): To use a battery of standardized tests for preclinical evaluation of potential new therapeutic agents for SCD.
- Genetic Modifiers of Single Gene Defect Diseases: To identify genetic factors that predisposes patients with SCD to develop specific end-organ complications and to experience more or less severe clinical courses. Identification of such genetics factors will reveal new targets for developing therapy individualized to specific complications of SCD, thus leading to improved outcomes and increased life expectancy for patients.
- Mechanisms of Fetal Hemoglobin Gene Silencing for Treatment of Sickle Cell Disease and Cooley's Anemia: To identify mechanisms of fetal hemoglobin gene silencing during normal human development and mechanisms of variable silencing in adults, and to develop therapeutic approaches to inhibit silencing. A renewed effort to understand the molecular basis of fetal hemoglobin silencing will facilitate the development of new gene-based therapeutic approaches to inhibit silencing, in order to increase fetal hemoglobin in red blood cells, and thus to cure beta-chain hemoglobinopathies such as SCD and Cooley's anemia.
- Molecular Screening Assay Development for SCD: To support the development and adaptation of biological assays for automated, high throughput screening of compounds that can potentially be used to improve the understanding of the biology of SCD and provide inroads toward new agents for SCD treatments.
- Pulmonary Complications of Sickle Cell Disease: To stimulate translational research on the pulmonary complications of SCD. The initiative will stimulate collaborative research between investigators in hematology and pulmonary science that combine basic and clinical approaches. It includes research on the major known pulmonary complications of SCD due to acute chest syndrome, pulmonary hypertension, and oxyhemoglobin desaturation.

Hydroxyurea is used to treat patients with SCD. It can prevent some of the vasoocclusive complications of the disease, an effect due in part to increase fetal hemoglobin (HbF) production. The treatment can improve the clinical course of the disease and prolong survival in some patients. Investigator-initiated studies are seeking to discover genes that regulate HbF level and HbF response to hydroxyurea.

In 2005, the NHLBI cosponsored two working groups with the NIH Office of Rare Diseases and the National Human Genome Research Institute. The first, entitled "An NIH Strategic Plan for the Development of Globin Gene Therapy for Treatment of Sickle Cell Disease and Cooley's Anemia," brought together leading investigators in the globin gene transfer field as well as patient advocates, the FDA, and industry representatives to discuss how the NHLBI can best facilitate translation of hemoglobin gene transfer into clinical trials for SCD and beta-thalassemia. The other, "Barriers to Late-Stage Drug Development for Hemoglobinopathies," brought together experts from the NIH, drug companies, contract research organizations, and academia to evaluate options

for the best ways to expedite drug development for hemoglobin disorders and other rare diseases.

The NHLBI addressed another area of serious concern for sickle cell patients, in 2005, by supporting a meeting on the "Renal and Urologic Complications in Sickle Cell Disease." The working group assembled hematologists, renal specialists, and urologists to discuss the research needs and opportunities associated with the renal and urologic system problems in patients with SCD.

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.

- Multicenter Study of Hydroxyurea (MSH) Patients' Follow-up (see Chapter 11): To determine the toxic effects of long-term hydroxyurea use in the patients who participated in the adult hydroxyurea clinical trial that ended successfully in 1995; 100 percent of the participants were black. A significant finding of the study was that patients who took hydroxyurea for 9 years experienced a 40 percent reduction in deaths.
- BABY HUG (see Chapter 11): To assess the effectiveness of hydroxyurea in preventing onset of chronic organ damage in young black children with sickle cell anemia. At baseline, this trial has demonstrated that spleens and kidneys are already damaged by 1 year of age.
- SWITCH (see Chapter 9): To demonstrate that hydroxyurea and phlebotomy can maintain an acceptable stroke recurrence rate and significantly reduce hepatic iron burden in comparison to transfusion plus chelation in children who have had prior overt stroke.
- Multicenter Neurocognitive and Neuroimaging Study in Adult Sickle Cell Disease: To assess baseline neurocognitive function and neuroimaging abnormalities in adults with SCD and to randomize patients identified with subnormal neurocognitive scores to receive 6 months of transfusion versus standard care, followed by reassessment of baseline neurocognitive function.

The NHLBI is supporting several transplant-related clinical studies that are seeking to reach minority populations. To ensure increased awareness and equitable opportunities for participation, the studies support bilingual transplant center personnel and provide public Web pages, educational materials, and informed consent documents in Spanish, Japanese, Korean, Chinese, and Vietnamese. In addition, focus groups have been held to identify barriers to participation.

- Blood and Marrow Transplant Clinical Research Network (see Chapter 11): In collaboration with the NCI, to promote the efficient comparison of innovative treatments and management strategies for patients undergoing blood or marrow transplantation. The Network has developed strategies and implemented procedures to enroll patients from minority groups.

The Cord Blood Stem Cell Transplantation (COBLT) Study was just completed in 2005. The COBLT bank contained more than 8,000 cord blood units; approximately 57 percent were from minority donors. Approximately 30 percent of the COBLT transplant patients were minority.

Each year in the United States approximately 1,500 children are diagnosed with sickle cell anemia, and 30 to 50 children with thalassemia. A recent retrospective analysis of 44 children who were transplanted with sibling cord blood for SCD or thalassemia showed that matched sibling cord blood transplantation offers the potential for a cure.

Transplants for patients with sickle cell anemia are performed at many centers across the United States, with few performed at a single center. To promote a unified strategy for sharing data, the NHLBI, with support from the National Center for Minority Health and Health Disparities, awarded a grant supplement to the International Bone Marrow Transplant Registry to collect data on demographics and outcomes of patients with sickle cell anemia who received a blood or marrow transplant.

Outcomes Research

In 2002 and 2003, the NHLBI held a workshop and three working groups to address the needs of adult SCD patients. One high priority recommendation was to develop and validate a health-related quality of life instrument specifically for adults with SCD. Subsequent working groups of consumers, clinicians, and researchers identified issues that are unique to SCD patients, such

as interactions with the health care system and the economic burden of living with SCD. In 2005, the Institute awarded a 3-year contract to develop a health-related quality of life questionnaire to be used in clinical studies.

Education

The NHLBI has developed a number of publications on SCD that target minorities.

- *Datos Sobre La Anemia Falciforme* (Facts About Sickle Cell Anemia)
- *Fact Sheet: Hydroxyurea in Pediatric Patients With Sickle Cell Disease*
- *Facts About Sickle Cell Anemia*
- *Patient Fact Sheet: The Multicenter Study of Hydroxyurea in Sickle Cell Anemia (MSH)*
- *Management and Therapy of Sickle Cell Disease.*

Cooley's Anemia

Cooley's anemia is an inherited disorder of red blood cells that affects primarily people of Mediterranean, African, Southeast Asian, Chinese, and Asiatic Indian origin. In 2000, the Institute initiated a program to establish a network of clinical research centers to evaluate new therapeutic agents. Research efforts include developing oral chelators to remove iron overload caused by repetitive transfusion therapy, testing drugs to enhance fetal hemoglobin production, and examining 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 establised.

- 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.

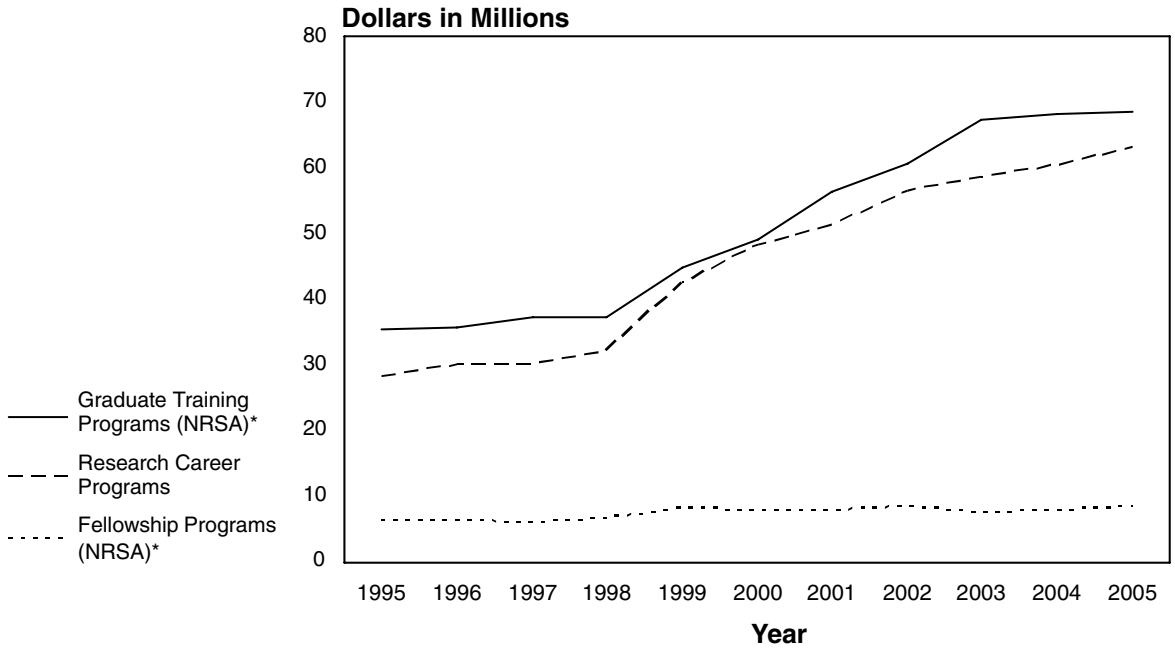
Investigator-initiated studies include efforts to develop oral chelators to remove the iron overload caused by repetitive transfusion therapy; exploration of hormone therapy for patients surviving into their teens; testing of drugs intended to enhance fetal hemoglobin production (hydroxyurea, butyrate, and decitabine); investigation of gene therapy approaches to cure the disease; prevention of bone diseases; optimum treatment of hepatitis; treatment of heart disease and iron overload; noninvasive ways of measuring iron burden; and efforts to improve the safety of the Nation's blood supply.

Women's Health Initiative

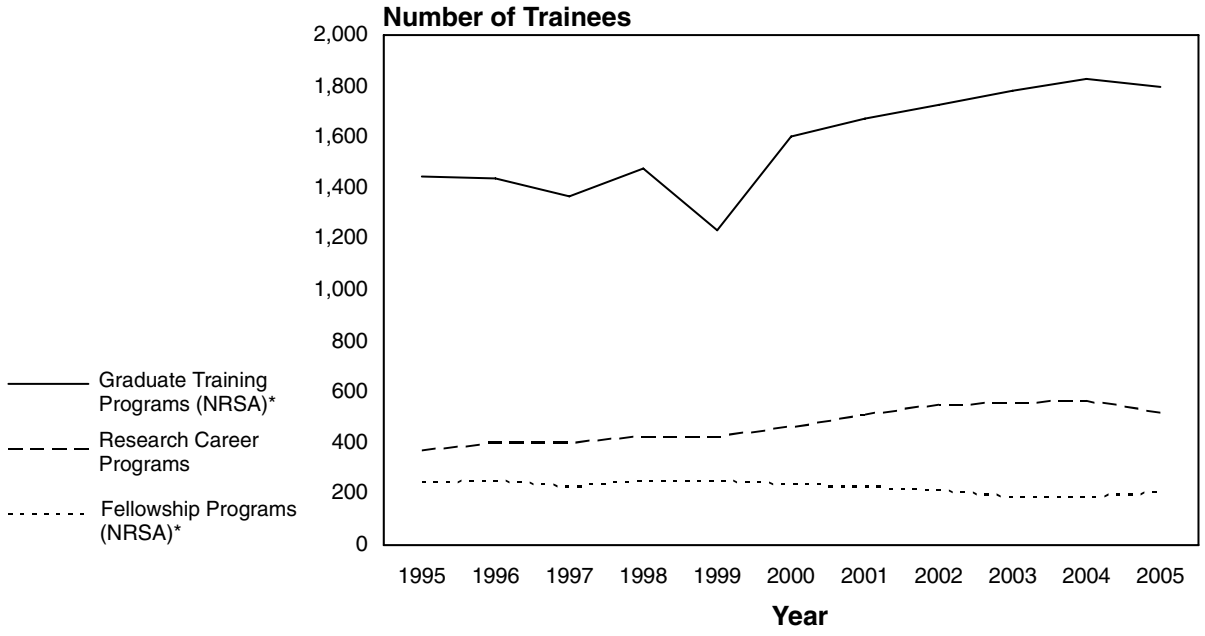
Coronary heart disease, cancer, and osteoporosis are the most common causes of death, disability, and impaired quality of life in postmenopausal women. The WHI (see Chapters 2 and 11) is addressing the benefits and risks of HT, changes in dietary patterns, and calcium/vitamin D supplements in disease prevention. Several of the centers have recruited primarily minority populations: blacks, Hispanics, Asians, Pacific Islanders, and American Indians. The Clinical Trial recruited 12,607 minorities and the Observational Study recruited 15,658. Overall, of the 161,809 postmenopausal women recruited into the WHI, 17 percent were minorities.

13. Research Training and Career Development Programs

NHLBI Research Training and Career Development Obligations: Fiscal Years 1995–2005



NHLBI Full-Time Training Positions: Fiscal Years 1995–2005



* 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 2005

	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)	25	25	$ 794,457	$ —	$ 794,457	0.9%
Individual NRSA (F32)	176	176	8,813,429	—	8,813,429	10.2
Senior Fellowships NRSA (F33)	1	1	57,536	—	57,536	0.1
Subtotal, Fellowships	202	202	9,665,422	—	9,665,422	11.2
Graduate Training Programs						
Institutional NRSA (T32)	215	1,540	65,275,920	5,248,233	70,524,153*	81.4
Minority Institutional NRSA (T32)	5	35	1,107,098	76,456	1,183,554	1.4
Off-Quarter Professional Student Training NRSA (T34, T35)	19	95	2,054,204	179,118	2,233,322	2.6
Short-Term Training for Minority Students (T35M)	36	128	2,713,088	262,887	2,975,975	3.4
Subtotal, Graduate Training Programs	275	1,798	71,150,310	5,766,694	76,917,004*	88.8
Total, Training Programs	**477**	**2,000**	**$80,815,732**	**$5,766,694**	**$86,582,426**	**100.0%**

* Excludes assessment of $1,764,000.

History of Training Obligations by Activity: Fiscal Years 1995–2005

	Dollars (Thousands)										
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Fellowship Programs											
Predoctoral Fellowship Award (F31)	$ 304	$ 551	$ 388	$ 466	$ 346	$ 248	$ 264	$ 478	$ 563	$ 549	$ 794
Individual NRSA (F32)	6,651	6,483	6,281	6,969	8,807	8,517	8,515	8,887	7,868	8,128	8,813
Senior Fellowships NRSA (F33)	99	233	179	125	90	92	147	84	112	144	58
Intramural NRSA (F35)	49	—	—	—	—	—	—	—	—	—	—
Subtotal, Fellowships	7,103	7,267	6,848	7,560	9,243	8,857	8,926	9,449	8,543	8,821	9,665
Graduate Training Programs											
Institutional NRSA (T32)	36,270[A]	36,718[B]	38,253[C]	37,904[D]	45,551[E]	50,507[F]	58,516[G]	62,999[H]	69,951[I]	71,229[J]	70,524[K]
Minority Institutional NRSA (T32)	982	679	898	706	901	1,167	996	1,092	1,006	734	1,184
Off-Quarter Professional Student Training NRSA (T34, T35)	951	1,001	1,216	1,435	1,384	966	1,974	1,987	1,975	1,993	2,233
MARC (T36)	5	5	5	5	5	5	5	—	—	—	—
Short-Term Training for Minority Students (T35M)	1,760	1,834	1,612	1,964	2,494	2,570	1,877	2,057	2,594	2,671	2,976
Subtotal, Training Grants	39,968	40,237	41,984	42,014	50,335	55,215	63,368	68,135	75,526	76,627	76,917
Total, Training Programs	**$47,071[A]**	**$47,504[B]**	**$48,832[C]**	**$49,574[D]**	**$59,578[E]**	**$64,072[F]**	**$72,294[G]**	**$77,584[H]**	**$84,069[I]**	**$85,448[J]**	**$85,582[K]**

A Excludes Assessment of $964,000.
B Excludes Assessment of $982,000.
C Excludes Assessment of $1,004,000.
D Excludes Assessment of $1,032,000.
E Excludes Assessment of $1,216,000.
F Excludes Assessment of $1,280,000.
G Excludes Assessment of $1,424,000.
H Excludes Assessment of $1,584,000.
I Excludes Assessment of $1,716,000.
J Excludes Assessment of $1,744,000.
K Excludes Assessment of $1,764,000.

Full-Time Training Positions by Activity: Fiscal Years 1995–2005

Number of Positions

	Fiscal Year										
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Fellowship Programs											
Predoctoral Fellowship Award (F31)	13	21	15	19	13	11	12	18	19	18	25
Individual NRSA (F32)	222	220	210	225	237	225	208	194	164	168	176
Senior Fellowships NRSA (F33)	4	7	5	4	2	2	3	2	2	3	1
Intramural NRSA (F35)	2	—	—	—	—	—	—	—	—	—	—
Subtotal, Fellowships	241	248	230	248	252	238	223	214	185	189	202
Graduate Training Programs											
Institutional NRSA (T32)	1,201	1,216	1,179	1,423	1,185	1,368	1,425	1,482	1,542	1,578	1,540
Minority Institutional NRSA (T32)	47	30	43	52	53	48	43	39	42	32	35
Off-Quarter Professional Student Training NRSA (T34, T35)	76	78	68	—	—	51	109	179	93	99	95
Short-Term Training for Minority Students (T35M)	125	113	75	—	—	136	93	30	107	119	128
Subtotal, Training Grants	1,449	1,437	1,365	1,475	1,238	1,603	1,670	1,730	1,784	1,828	1,798
Total, Training Positions	**1,690**	**1,685**	**1,595**	**1,723**	**1,490**	**1,841**	**1,893**	**1,944**	**1,969**	**2,017**	**2,000**

NHLBI Research Career Programs: Fiscal Years 1995–2005

Number of Awards

	Fiscal Year										
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Mentored Research Scientist Development Award for Minority Faculty (K01)	—	—	5	19	30	29	44	54	47	46	45
Minority Institution Faculty Mentored Research Scientist Development Award (K01)	—	—	1	—	—	11	9	2	7	6	4
Mentored Scientist Development Award in Research Ethics (K01)	—	—	—	—	—	—	—	—	2	2	3
Independent Scientist Award (K02)	—	3	8	14	18	27	34	33	32	31	32
Research Career Development Award (K04)	30	25	18	10	6	1	—	—	—	—	—
Research Career Award (K06)	3	3	3	3	2	2	2	2	2	1	1
Preventive Cardiology Academic Award (K07)	7	—	—	—	—	—	—	—	—	—	—
Preventive Pulmonary Academic Award (K07)	4	—	—	—	—	—	—	—	—	—	—
Transfusion Medicine Academic Award (K07)	5	2	—	—	—	—	—	—	—	—	—
Systemic Pulmonary and Vascular Disease Academic Award (K07)	15	11	9	3	3	1	—	—	—	—	—
Asthma Academic Award (K07)	9	9	9	6	3	—	—	—	—	—	—
Tuberculosis Academic Award (K07)	15	19	23	20	13	9	5	—	—	—	—
Sleep Academic Award (K07)	—	8	12	20	20	20	12	8	—	—	—
Nutrition Academic Award (K07)	—	—	—	10	10	19	19	19	9	9	—
Cultural Competence and Health Disparities Academic Award (K07)	—	—	—	—	—	—	—	—	—	8	14
Clinical Investigator Development Award (K08)	222	254	267	278	262	257	241	236	240	229	239
Physician Scientist Award (K11)	22	12	—	—	—	—	—	—	—	—	—
Minority School Faculty Development Award (K14)	11	15	9	—	—	4	1	—	—	—	—
Research Development Award for Minority Faculty (K14)	28	36	34	37	22	7	—	—	—	—	—
Career Enhancement Award for Stem Cell Research (K18)	—	—	—	—	—	—	—	—	1	5	3
NHLBI Career Transition Award (K22)	—	—	—	—	—	—	—	—	—	1	2
Mentored Patient-Oriented Research Career Development Award (K23)	—	—	—	—	13	36	58	90	110	122	127
Midcareer Investigator Award in Patient-Oriented Research (K24)	—	—	—	—	11	20	27	37	38	32	32
Mentored Quantitative Research Career Development Award (K25)	—	—	—	—	—	—	2	7	9	12	17
Clinical Research Curriculum Award (K30)	—	—	—	—	9	16	55	55	55	55	0*
Total, Research Career Programs	**371**	**397**	**398**	**420**	**422**	**459**	**509**	**543**	**552**	**559**	**519**

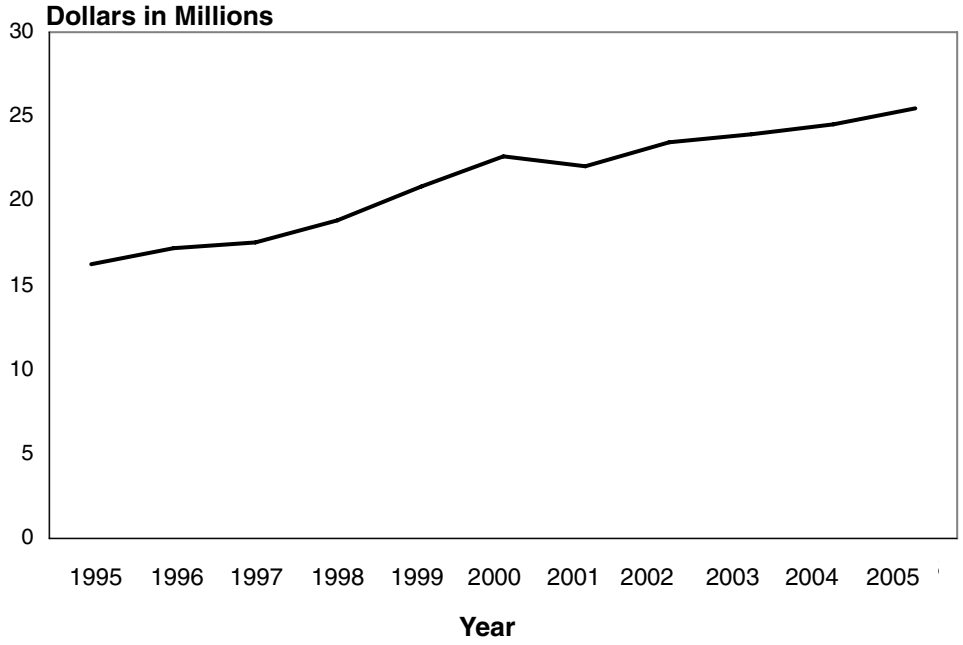
*In FY 2005, the NHLBI relinquished management of the K30 program and as a result no longer receives the grant count.

NHLBI Research Career Program Obligations: Fiscal Years 1995–2005

Dollars (Thousands)

	Fiscal Year										
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
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
Minority Institution Faculty Mentored Research Scientist Award (K01)	—	—	106	101	905	1,300	1,143	1,703	991	867	588
Mentored Scientist Development Award in Research Ethics (K01)	—	—	—	—	—	—	—	—	255	253	355
Independent Scientist Award (K02)	—	207	545	933	1,548	2,350	3,202	3,130	3,099	3,079	3,218
Research Career Development Award (K04)	2,006	1,693	1,226	684	568	69	—	—	—	—	—
Research Career Award (K06)	104	105	103	103	70	70	70	69	69	34	34
Preventive Cardiology Academic Award (K07)	957	—	—	—	—	—	—	—	—	—	—
Preventive Pulmonary Academic Award (K07)	309	—	—	—	—	—	—	—	—	—	—
Transfusion Medicine Academic Award (K07)	485	326	—	—	—	—	—	—	—	—	—
Systemic Pulmonary and Vascular Diseases Academic Award (K07)	2,295	1,715	1,415	386	423	113	—	—	—	—	—
Asthma Academic Award (K07)	749	740	764	509	248	—	—	—	—	—	—
Tuberculosis Academic Award (K07)	1,155	1,496	1,831	1,566	1,161	745	396	—	—	—	—
Sleep Academic Award (K07)	—	699	1,027	1,734	1,736	1,760	1,081	722	—	—	—
Nutrition Academic Award (K07)	—	—	—	1,491	1,480	2,829	2,869	2,906	1,472	1,516	—
Cultural Competence and Health Disparities Academic Award (K07)	—	—	—	—	—	—	—	—	—	925	1,620
Clinical Investigator Development Award (K08)	18,090	21,093	22,238	23,122	29,741	30,189	29,263	29,295	30,288	29,037	30,429
Physician Scientist Award (K11)	1,903	1,023	—	—	—	—	—	—	—	—	—
Minority School Faculty Development Award (K14)	810	1,158	729	618	445	862	98	—	—	—	—
Research Development Award for Minority Faculty (K14)	2,812	3,607	3,468	3,099	2,093	393	—	—	—	—	—
Career Enhancement Award for Stem Cell Research (K18)	—	—	—	—	—	—	—	—	243	980	512
NHLBI Career Transition Award (K22)	—	—	—	—	—	—	—	—	—	185	364
Mentored Patient-Oriented Research Career Development Award (K23)	—	—	—	—	1,687	4,619	7,570	11,909	14,571	16,216	17,086
Midcareer Investigator Award in Patient-Oriented Research (K24)	—	—	—	—	1,054	2,072	2,877	4,058	4,368	3,815	3,929
Mentored Quantitative Research Career Development Award (K25)	—	—	—	—	—	—	272	921	1,195	1,622	2,206
Clinical Research Curriculum Award (K30)	—	—	—	—	1,772	3,163	3,073	3,090	3,110	3,115	4,589
Total, Research Career Program Obligations	**$31,675**	**$33,862**	**$33,912**	**$36,069**	**$47,669**	**$54,184**	**$57,470**	**$63,514**	**$65,817**	**$67,794**	**$71,018**

NHLBI Minority Biomedical Research Training, Career Development, and Research Supplements Program Obligations: Fiscal Years 1995–2005



NHLBI Minority Biomedical Research Training, Career Development, and Research Supplements Program Obligations: Fiscal Years 1995–2005

	Dollars (Thousands)										
	Fiscal Year										
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
MARC Summer Research Training Program	$ 28	$ 32	$ 17	$ —	$ 10	$ 4	$ 20	$ 15	$ 4	$ —	$ —
Mentored Research Scientist Development Award for Minority Faculty	—	—	460	1,723	2,738	3,650	5,556	5,711	6,156	6,150	6,088
MARC	—	5	5	5	—	5	5	—	—	—	—
Minority Biomedical Research Support (MBRS)	2,313	2,503	2,722	2,978	3,423	3,873	3,165	2,793	3,600	2,806	2,846
Minority Institution Faculty Mentored Research Scientist Development Award	—	—	106	101	905	1,300	1,143	1,703	991	867	588
Minority Institution Research Training Program	982	679	898	706	901	1,167	996	1,092	1,006	734	1,184
Minority Predoctoral Fellowship	304	551	388	436	345	248	264	278	308	374	545
Minority Research Supplements Program	7,265	6,714	7,070	7,043	7,440	8,304	8,587	9,822	9,323	10,938	11,214
Minority School Faculty Development Award	810	1,158	729	618	445	862	98	—	—	—	—
Reentry Supplements	—	140	152	249	106	176	384	—	—	—	96
Research Development Award for Minority Faculty	2,812	3,607	3,468	3,099	2,093	393	—	—	—	—	—
Short-Term Training for Minority Students	1,760	1,834	1,612	1,964	2,494	2,570	1,876	2,057	2,594	2,671	2,976
Total, Minority Programs	**$16,274**	**$17,223**	**$17,627**	**$18,922**	**$20,900**	**$22,552**	**$22,094**	**$23,471**	**$23,982**	**$24,540**	**$25,537**

NHLBI Research Supplements Program by Award Type: Fiscal Years 1995–2005

Number of Awards

	Fiscal Year										
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Minority Supplements											
Investigator	49	42	38	31	32	33	33	46	47	35	29
Postdoctoral	39	49	47	50	47	42	41	33	38	37	52
Graduate	42	37	36	48	53	47	43	45	57	61	80
Undergraduate	27	12	23	25	17	19	12	17	18	17	12
High School	10	8	9	11	6	—	3	3	4	3	7
Post-Master/Post-Baccalaureate	—	—	—	—	—	—	—	2	8	17	16
Reentry Supplements	—	2	2	3	2	1	3	—	—	3	2
Disability Supplements	4	3	3	2	1	5	4	5	4	3	2
Total, Research Supplements Program	**171**	**153**	**158**	**170**	**158**	**147**	**139**	**151**	**176**	**176**	**200**

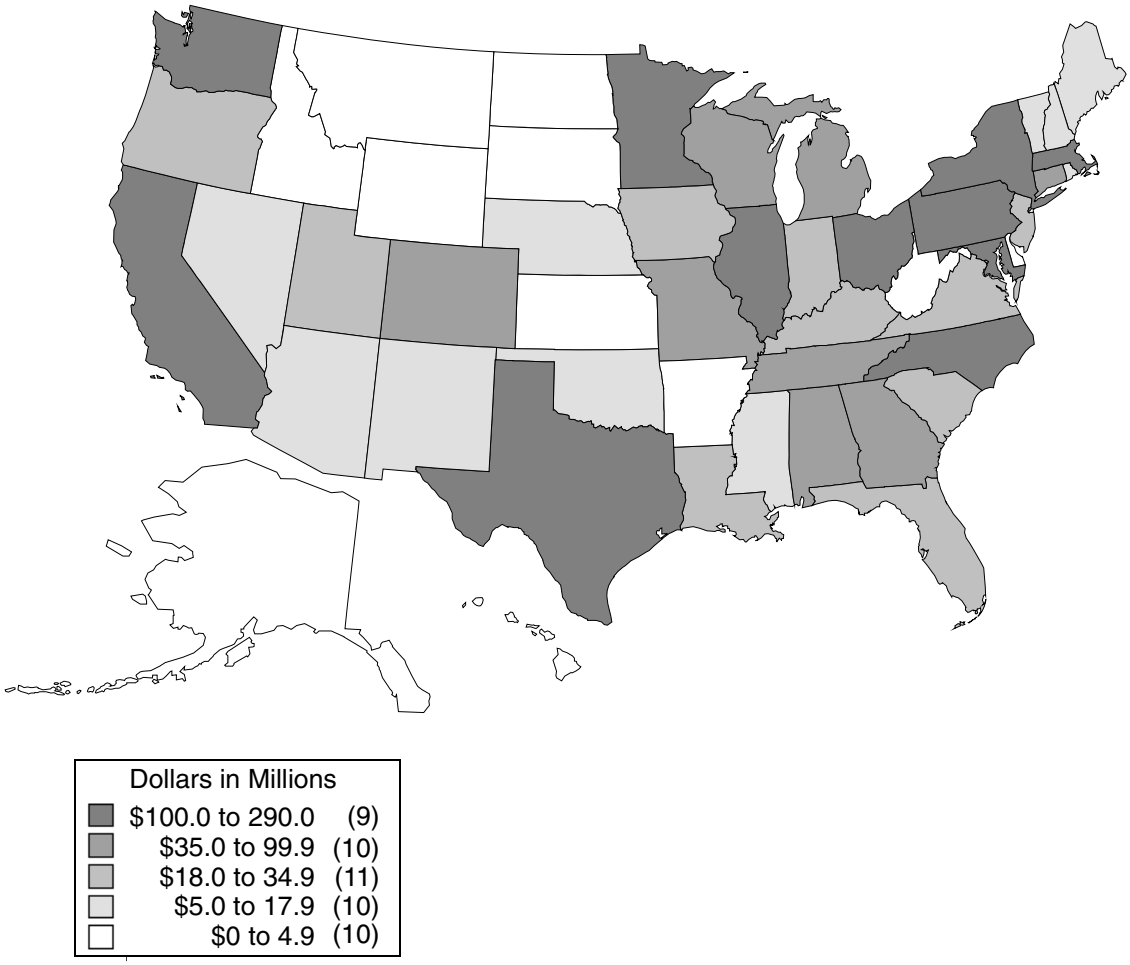
NHLBI Research Supplements Program Obligations by Award Type: Fiscal Years 1995–2005

Dollars (Thousands)

	Fiscal Year										
	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Minority Supplements											
Investigator	$3,319	$2,552	$2,412	$2,185	$2,331	$3,262	$3,430	$5,046	$3,844	$4,256	$3,552
Postdoctoral	2,153	2,899	3,172	3,032	3,110	3,053	3,086	2,554	2,655	2,713	3,432
Graduate	1,402	1,116	1,181	1,527	1,806	1,791	1,818	1,864	2,181	2,439	3,208
Undergraduate	351	120	273	246	166	198	235	260	301	282	179
High School	40	27	32	53	27	—	18	33	33	13	30
Post-Master/Post-Baccalaureate	—	—	—	—	—	—	—	65	309	597	618
Reentry Supplements	—	140	152	249	106	176	384	—	—	495	96
Disability Supplements	277	194	165	96	72	282	187	474	360	143	99
Total, Research Supplements Program	**$7,542**	**$7,048**	**$7,387**	**$7,388**	**$7,618**	**$8,762**	**$9,158**	**$10,296**	**$9,683**	**$10,938**	**$11,214**

14. Geographic Distribution of Awards: Fiscal Year 2005

Geographic Distribution of Awards by State: Fiscal Year 2005



Geographic Distribution of Awards by State or Country: Fiscal Year 2005

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Alabama								
Auburn University at Auburn	2	380,048	1	328,500	1	51,548	—	—
Cooper Green Hospital, Birmingham	1	582,468	1	582,468	—	—	—	—
Elgavish Paramagnetics, Inc.	1	100,000	1	100,000	—	—	—	—
University of Alabama at Birmingham	69	32,839,914	58	28,667,267	7	1,154,924	4	3,017,723
University of South Alabama	15	5,423,954	14	5,242,731	1	181,223	—	—
Total Alabama	**88**	**39,326,384**	**75**	**34,920,966**	**9**	**1,387,695**	**4**	**3,017,723**
Alaska								
Norton Sound Health Corporation	1	347,057	1	347,057	—	—	—	—
Total Alaska	**1**	**347,057**	**1**	**347,057**	**—**	**—**	**—**	**—**
Arizona								
Arizona State University	5	1,119,919	5	1,119,919	—	—	—	—
AzERx, LLC	1	469,590	1	469,590	—	—	—	—
ImaRx Therapeutics, Inc.	1	381,903	1	381,903	—	—	—	—
Mayo Clinic, Arizona	2	777,500	2	777,500	—	—	—	—
St. Joseph's Hospital and Medical Center	1	295,329	1	295,329	—	—	—	—
University of Arizona	32	11,498,585	28	10,131,733	3	692,507	1	674,345
Western Research Company, Inc.	1	100,000	1	100,000	—	—	—	—
Total Arizona	**43**	**14,642,826**	**39**	**13,275,974**	**3**	**692,507**	**1**	**674,345**
Arkansas								
Arkansas Children's Hospital Research Institute	1	155,250	1	155,250	—	—	—	—
University of Arkansas at Fayetteville	1	202,820	1	202,820	—	—	—	—
University of Arkansas for Medical Sciences, Little Rock	6	2,062,083	6	2,062,083	—	—	—	—
Total Arkansas	**8**	**2,420,153**	**8**	**2,420,153**	**—**	**—**	**—**	**—**
California								
21st Century Medicine, Inc.	1	245,045	1	245,045	—	—	—	—
AntiCancer, Inc.	1	149,800	1	149,800	—	—	—	—
Applied Scientific Research	1	163,372	1	163,372	—	—	—	—
Arete Therapeutics, Inc.	1	100,000	1	100,000	—	—	—	—
AriZeke Pharmaceuticals, Inc.	1	251,779	1	251,779	—	—	—	—
BioTime, Inc.	1	149,996	1	149,996	—	—	—	—
Blaufuss Medical Multimedia Laboratories	1	371,040	1	371,040	—	—	—	—
Blood Systems Research Institute	2	1,753,248	1	348,827	—	—	1	1,404,421
Burnham Institute	9	4,684,216	9	4,684,216	—	—	—	—
California Institute of Technology	4	1,551,773	3	1,503,477	1	48,296	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
California Pacific Medical Center, Pacific Campus	1	424,565	1	424,565	—	—	—	—
California State Polytechnic University, Pomona	—	160,936	—	160,936	—	—	—	—
California State University, Sacramento	—	4,000	—	4,000	—	—	—	—
Cardica, Inc.	1	100,000	1	100,000	—	—	—	—
Cedars-Sinai Medical Center	6	3,672,797	6	3,672,797	—	—	—	—
Cerus Corporation	1	374,303	1	374,303	—	—	—	—
Charles R. Drew University of Medicine and Science	1	173,427	1	173,427	—	—	—	—
Children's Hospital and Research Center at Oakland	13	8,119,120	12	8,010,693	1	108,427	—	—
Children's Hospital of Los Angeles	17	9,277,234	17	9,277,234	—	—	—	—
Children's Hospital of Orange County	1	21,409	—	—	1	21,409	—	—
City of Hope/Beckman Research Institute	4	1,834,602	4	1,834,602	—	—	—	—
Cytograft Tissue Engineering, Inc.	1	851,862	1	851,862	—	—	—	—
Diagnostics for the Real World, Ltd.	2	733,059	2	733,059	—	—	—	—
Functional Insect Genomics Institute	1	235,001	1	235,001	—	—	—	—
Gamma Medica, Inc.	1	89,771	1	89,771	—	—	—	—
Good Samaritan Hospital	1	305,875	1	305,875	—	—	—	—
House Ear Institute	1	283,500	1	283,500	—	—	—	—
HTD BioSystems, Inc.	1	468,604	1	468,604	—	—	—	—
Intelligent Optical Systems, Inc.	2	324,579	2	324,579	—	—	—	—
ISCHEM Corporation	1	374,972	1	374,972	—	—	—	—
J. David Gladstone Institutes	7	3,710,494	6	3,659,630	1	50,864	—	—
Kaiser Foundation Research Institute	9	8,629,372	6	6,100,021	—	—	3	2,529,351
LA Biomedical Research Institute at Harbor-UCLA Medical Center	12	4,278,589	11	3,961,178	—	—	1	317,411
La Jolla Bioengineering Institute	1	509,600	1	509,600	—	—	—	—
La Jolla Institute for Molecular Medicine	4	1,520,236	4	1,520,236	—	—	—	—
LaunchPoint Technologies, LLC	1	237,161	1	237,161	—	—	—	—
Loma Linda University	6	1,409,584	5	1,353,000	1	56,584	—	—
Los Angeles Orthopaedic Foundation	1	342,700	1	342,700	—	—	—	—
MacroPore Biosurgery, Inc.	1	536,575	1	536,575	—	—	—	—
Molecular Express, Inc.	1	138,000	1	138,000	—	—	—	—
Northern California Institute for Research and Education	5	6,506,828	5	6,506,828	—	—	—	—
Pacific Tuberculosis/Cancer Research Organization	1	470,884	1	470,884	—	—	—	—
Palo Alto Medical Foundation Research Institute	1	675,351	1	675,351	—	—	—	—
Panorama Research, Inc.	1	105,735	1	105,735	—	—	—	—
PhiloMetron, Inc.	1	97,509	1	97,509	—	—	—	—
Physical Optics Corporation	2	213,333	2	213,333	—	—	—	—
Portola Pharmaceuticals, Inc.	1	100,105	1	100,105	—	—	—	—
Process Metrix, LLC	1	99,914	1	99,914	—	—	—	—
Rand Corporation	1	672,890	1	672,890	—	—	—	—
Salk Institute for Biological Studies	1	648,642	1	648,642	—	—	—	—
San Diego State University	10	5,283,904	10	5,283,904	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Sangart, Inc.	1	324,055	1	324,055	—	—	—	—
Scripps Research Institute	39	19,856,943	34	18,910,837	5	946,106	—	—
Sidney Kimmel Cancer Center	2	1,277,992	2	1,277,992	—	—	—	—
SRI International	1	502,044	1	502,044	—	—	—	—
Stanford University	69	33,895,421	57	31,257,683	10	1,230,693	2	1,407,045
Sunny BioDiscovery, Inc.	1	94,960	1	94,960	—	—	—	—
Torrey Pines Institute for Molecular Studies	1	455,000	1	455,000	—	—	—	—
Tristan Technologies, Inc.	1	100,001	1	100,001	—	—	—	—
University of California, Berkeley	9	1,997,015	7	1,886,649	2	110,366	—	—
University of California, Davis	32	10,823,380	28	9,633,837	3	467,692	1	721,851
University of California, Irvine	17	5,410,152	14	5,094,523	2	84,136	1	231,493
University of California, Lawrence Berkeley National Laboratory	8	6,200,478	7	6,168,597	1	31,881	—	—
University of California, Los Angeles	61	32,590,607	52	30,770,395	7	1,441,913	2	378,299
University of California, Merced	1	49,928	—	—	1	49,928	—	—
University of California, Riverside	1	368,452	1	368,452	—	—	—	—
University of California, San Diego	81	42,874,680	67	38,855,742	12	3,250,952	2	767,986
University of California, San Francisco	94	41,214,856	84	38,560,214	7	1,547,723	3	1,106,919
University of California, Santa Barbara	3	613,157	2	569,181	1	43,976	—	—
University of Southern California	23	10,223,027	23	10,223,027	—	—	—	—
Veterans Medical Research Foundation, San Diego	3	959,500	3	959,500	—	—	—	—
Virogenics, Inc.	1	100,000	1	100,000	—	—	—	—
Volcano Corporation	2	880,249	2	880,249	—	—	—	—
Total California	**597**	**284,249,188**	**525**	**265,893,466**	**56**	**9,490,946**	**16**	**8,864,776**
Colorado								
Colorado State University, Fort Collins	4	798,961	3	750,665	1	48,296	—	—
Denver Health and Hospital Authority	2	1,241,872	2	1,241,872	—	—	—	—
Kestrel Labs, Inc.	2	763,623	2	763,623	—	—	—	—
Keystone Symposia	6	95,000	6	95,000	—	—	—	—
Living Systems, Inc.	1	132,904	1	132,904	—	—	—	—
Metafluidics, Inc.	3	557,445	2	397,590	—	—	1	159,855
National Jewish Medical and Research Center	31	16,226,131	29	16,120,851	2	105,280	—	—
Rose Biomedical Development Corporation	2	290,468	2	290,468	—	—	—	—
University of Colorado at Boulder	10	2,657,823	7	2,203,095	3	454,728	—	—
University of Colorado at Denver and Health Sciences Center, Aurora	65	27,702,329	55	23,645,893	7	2,009,579	3	2,046,857
Total Colorado	**126**	**50,466,556**	**109**	**45,641,961**	**13**	**2,617,883**	**4**	**2,206,712**
Connecticut								
Evergen Biotechnologies, Inc.	1	140,000	1	140,000	—	—	—	—
John B. Pierce Laboratory, Inc.	2	708,050	2	708,050	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Protein Sciences Corporation	1	99,866	—	—	—	—	1	99,866
University of Connecticut School of Medicine and Dental Medicine	16	7,360,690	16	7,360,690	—	—	—	—
University of Connecticut, Storrs	1	345,875	1	345,875	—	—	—	—
Yale University	66	29,475,442	55	26,819,256	10	1,974,765	1	681,421
Total Connecticut	**87**	**38,129,923**	**75**	**35,373,871**	**10**	**1,974,765**	**2**	**781,287**
Delaware								
Compact Membrane Systems, Inc.	2	598,921	2	598,921	—	—	—	—
University of Delaware	1	339,750	1	339,750	—	—	—	—
Total Delaware	**3**	**938,671**	**3**	**938,671**	**—**	**—**	**—**	**—**
District of Columbia								
American College of Obstetricians and Gynecologists	1	27,092	—	—	—	—	1	27,092
American Institutes for Research	1	1,190,952	—	—	—	—	1	1,190,952
American Society of Hematology	1	15,000	1	15,000	—	—	—	—
Catholic University of America	1	233,700	1	233,700	—	—	—	—
Children's Research Institute	5	1,913,076	4	1,779,242	—	—	1	133,834
George Washington University	8	3,062,484	7	2,776,147	—	—	1	286,337
Georgetown University	16	7,159,757	16	7,159,757	—	—	—	—
HealthMark Multimedia, LLC	1	397,894	1	397,894	—	—	—	—
Howard University	7	3,764,954	5	3,516,246	1	136,670	1	112,038
MedStar Research Institute	1	905,991	—	—	—	—	1	905,991
Toborg Associates, Inc.	1	120,506	1	120,506	—	—	—	—
U.S. Bureau of the Census	1	179,000	—	—	—	—	1	179,000
U.S. Department of Agriculture	1	200,000	1	200,000	—	—	—	—
Total District of Columbia	**45**	**19,170,406**	**37**	**16,198,492**	**1**	**136,670**	**7**	**2,835,244**
Florida								
Alpha-1 Foundation	1	10,000	1	10,000	—	—	—	—
Altor Bioscience Corporation	1	110,542	1	110,542	—	—	—	—
Florida Atlantic University	2	526,875	2	526,875	—	—	—	—
Florida Institute of Technology	2	566,125	2	566,125	—	—	—	—
Florida International University	—	439,859	—	439,859	—	—	—	—
Florida State University	1	219,000	1	219,000	—	—	—	—
H. Lee Moffitt Cancer Center and Research Institute	1	127,440	1	127,440	—	—	—	—
Innovia, LLC	1	336,318	1	336,318	—	—	—	—
Nemours Children's Clinic	1	421,019	1	421,019	—	—	—	—
Saneron CCEL Therapeutics, Inc.	1	158,379	1	158,379	—	—	—	—
University of Central Florida	2	553,000	2	553,000	—	—	—	—
University of Florida	46	18,584,718	43	17,210,987	2	183,702	1	1,190,029
University of Miami, Coral Gables	4	3,163,911	3	2,842,778	1	321,133	—	—
University of Miami Medical Center	18	7,077,882	15	6,128,276	1	312,983	2	636,623
University of South Florida	6	1,999,541	6	1,999,541	—	—	—	—
Total Florida	**87**	**34,294,609**	**80**	**31,650,139**	**4**	**817,818**	**3**	**1,826,652**

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Georgia								
Bresagen, Inc.	—	83,797	—	83,797	—	—	—	—
Emory University	62	24,865,935	55	22,322,289	5	815,978	2	1,727,668
geneRx+, Inc.	1	97,589	1	97,589	—	—	—	—
Georgia Institute of Technology	7	2,860,596	5	2,753,696	2	106,900	—	—
Georgia State University	2	426,632	2	426,632	—	—	—	—
Medical College of Georgia	33	12,971,937	30	12,493,192	3	478,745	—	—
Minority Health Professions Foundation	—	50,000	—	50,000	—	—	—	—
Morehouse School of Medicine	10	3,708,715	9	3,484,250	1	224,465	—	—
U.S. Centers for Disease Control and Prevention	1	725,000	—	—	—	—	1	725,000
University of Georgia	3	466,305	2	437,400	1	28,905	—	—
Zygogen, LLC	1	100,000	1	100,000	—	—	—	—
Total Georgia	**120**	**46,356,506**	**105**	**42,248,845**	**12**	**1,654,993**	**3**	**2,452,668**
Hawaii								
Pacific Health Research Institute	2	921,703	2	921,703	—	—	—	—
Queen's Medical Center	1	600,000	1	600,000	—	—	—	—
University of Hawaii at Hilo	—	220,535	—	220,535	—	—	—	—
University of Hawaii at Manoa	4	943,833	3	943,832	—	—	1	1
Total Hawaii	**7**	**2,686,071**	**6**	**2,686,070**	**—**	**—**	**1**	**1**
Illinois								
Academic Pharmaceuticals, Inc.	1	102,008	1	102,008	—	—	—	—
AJ Medical Devices, Inc.	1	656,245	1	656,245	—	—	—	—
Children's Memorial Hospital, Chicago	1	98,010	1	98,010	—	—	—	—
cue BIOtech, Inc.	1	360,180	—	—	—	—	1	360,180
DePaul University	1	107,250	1	107,250	—	—	—	—
Evanston Northwestern Healthcare Research Institute	3	1,324,881	3	1,324,881	—	—	—	—
Hektoen Institute for Medical Research	2	721,553	2	721,553	—	—	—	—
Howard Brown Health Center	—	125,000	—	125,000	—	—	—	—
Illinois Institute of Technology	1	331,953	1	331,953	—	—	—	—
Loyola University, Chicago	19	6,571,062	17	6,469,400	2	101,662	—	—
Midwestern University	1	212,744	1	212,744	—	—	—	—
Northwestern University	65	24,612,549	57	22,412,587	6	1,040,980	2	1,158,982
Rosalind Franklin University of Medicine and Science	1	273,000	1	273,000	—	—	—	—
Rush University Medical Center	9	3,516,271	8	3,216,231	—	—	1	300,040
Southern Illinois University School of Medicine	1	246,750	1	246,750	—	—	—	—
University of Chicago	46	18,376,996	39	16,623,028	6	1,611,667	1	142,301
University of Illinois at Chicago	55	24,340,552	48	22,476,505	7	1,864,047	—	—
University of Illinois, Urbana–Champaign	1	492,838	1	492,838	—	—	—	—
Total Illinois	**209**	**82,469,842**	**183**	**75,889,983**	**21**	**4,618,356**	**5**	**1,961,503**

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Indiana								
Ball State University	1	203,750	1	203,750	—	—	—	—
EndGenitor Technologies, Inc.	1	107,000	1	107,000	—	—	—	—
Indiana University–Purdue University at Indianapolis	49	18,434,135	44	17,612,665	5	821,470	—	—
Predictive Physiology and Medicine, Inc.	1	136,900	1	136,900	—	—	—	—
Purdue University, West Lafayette	1	371,631	1	371,631	—	—	—	—
Space Hardware Optimization Technology, Inc.	1	547,445	1	547,445	—	—	—	—
University of Notre Dame	4	2,825,337	4	2,825,337	—	—	—	—
Total Indiana	**58**	**22,626,198**	**53**	**21,804,728**	**5**	**821,470**	**—**	**—**
Iowa								
Des Moines University-Osteopathic Medical Center	1	180,295	1	180,295	—	—	—	—
Luther College	1	186,701	1	186,701	—	—	—	—
Maharishi University of Management	1	492,385	1	492,385	—	—	—	—
University of Iowa	75	32,794,402	69	31,123,316	5	1,671,085	1	1
Total Iowa	**78**	**33,653,783**	**72**	**31,982,697**	**5**	**1,671,085**	**1**	**1**
Kansas								
Kansas State University	3	418,784	2	396,558	1	22,226	—	—
University of Kansas, Lawrence	2	678,827	2	678,827	—	—	—	—
University of Kansas Medical Center	3	915,955	2	884,936	1	31,019	—	—
Wichita State University	1	180,660	1	180,660	—	—	—	—
Total Kansas	**9**	**2,194,226**	**7**	**2,140,981**	**2**	**53,245**	**—**	**—**
Kentucky								
Endoprotech, Inc.	1	122,978	1	122,978	—	—	—	—
University of Kentucky	28	8,256,455	26	8,113,042	2	143,413	—	—
University of Louisville	33	12,128,597	30	11,897,589	3	231,008	—	—
VitaTech, LLC	1	873,958	1	873,958	—	—	—	—
Total Kentucky	**63**	**21,381,988**	**58**	**21,007,567**	**5**	**374,421**	**—**	**—**
Louisiana								
Children's Hospital, New Orleans	1	214,500	1	214,500	—	—	—	—
Louisiana State University and Agricultural and Mechanical College, Baton Rouge	1	367,500	1	367,500	—	—	—	—
Louisiana State University Health Sciences Center, New Orleans	12	4,706,264	11	4,706,263	—	—	1	1
Louisiana State University Health Sciences Center, Shreveport	3	754,050	3	754,050	—	—	—	—
Louisana State University Pennington Biomedical Research Center	3	2,121,323	3	2,121,323	—	—	—	—
Ochsner Clinic Foundation	1	285,000	1	285,000	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Southeastern Louisiana University	1	179,092	1	179,092	—	—	—	—
Tulane University of Louisiana	22	10,236,526	20	10,014,643	2	221,883	—	—
Total Louisiana	**44**	**18,864,255**	**41**	**18,642,371**	**2**	**221,883**	**1**	**1**
Maine								
Jackson Laboratory	10	6,332,191	9	6,326,300	1	5,891	—	—
Maine Medical Center	5	1,793,050	5	1,793,050	—	—	—	—
University of Maine, Orono	2	1,131,313	2	1,131,313	—	—	—	—
Total Maine	**17**	**9,256,554**	**16**	**9,250,663**	**1**	**5,891**	**—**	**—**
Maryland								
Active Signal Technologies, Inc.	1	147,678	1	147,678	—	—	—	—
Adlyfe, Inc.	—	680,746	—	680,746	—	—	—	—
American Institutes for Research	2	3,135,214	—	—	—	—	2	3,135,214
BioConneXions, LLC	1	99,963	1	99,963	—	—	—	—
Bon Secours Hospital, Baltimore	1	597,533	1	597,533	—	—	—	—
Clinical Trials and Surveys Corporation	2	1,788,264	—	—	—	—	2	1,788,264
Constella Group, Inc.	2	1,408,797	—	—	—	—	2	1,408,797
EMMES Corporation	3	1,771,719	1	449,973	—	—	2	1,321,746
Federation of American Societies for Experimental Biology	4	55,000	4	55,000	—	—	—	—
Hager Sharp, Inc.	1	300,000	—	—	—	—	1	300,000
Henry M. Jackson Foundation for the Advancement of Military Medicine	7	2,479,525	5	1,632,783	1	286,420	1	560,322
Infinite Biomedical Technologies, LLC	1	377,005	1	377,005	—	—	—	—
Innovative Biosensors, Inc.	1	110,272	1	110,272	—	—	—	—
International Registry of Pathology, Inc.	1	353,961	1	353,961	—	—	—	—
Intronn, Inc.	1	1,191,834	1	1,191,834	—	—	—	—
J. Craig Venter Institute	1	1,975,794	—	—	—	—	1	1,975,794
Johns Hopkins University	168	78,100,179	145	70,517,443	17	4,169,729	6	3,413,007
Maryland Medical Research Institute	1	1,340,090	—	—	—	—	1	1,340,090
MasiMax Resources, Inc.	1	961,000	—	—	—	—	1	961,000
MedStar Research Institute	4	5,366,804	4	5,366,804	—	—	—	—
National Cancer Institute	1	500,000	—	—	—	—	1	500,000
National Center for Complementary and Alternative Medicine	1	200,000	—	—	—	—	1	200,000
National Center for Health Statistics	1	981,000	—	—	—	—	1	981,000
National Center for Research Resources	2	3,882,000	—	—	—	—	2	3,882,000
National Institute of Child Health and Human Development	3	8,149,282	—	—	—	—	3	8,149,282
National Institute of Diabetes and Digestive and Kidney Diseases	2	5,000,000	—	—	—	—	2	5,000,000
National Institutes of Health	1	12,072,988	—	—	—	—	1	12,072,988
National Institute of Neurological Disorders and Stroke	1	1,288,100	—	—	—	—	1	1,288,100

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
North American Vascular Biology Organization	1	15,000	1	15,000	—	—	—	—
NovaScreen Biosciences Corporation	1	204,929	1	204,929	—	—	—	—
Peace Technology, Inc.	1	2,642,000	—	—	—	—	1	2,642,000
SeraCare Life Sciences, Inc.	1	1,035,522	—	—	—	—	1	1,035,522
University of Maryland Baltimore Professional School	47	21,440,146	43	20,718,963	4	721,183	—	—
University of Maryland Biotechnology Institute	1	371,250	1	371,250	—	—	—	—
University of Maryland, College Park Campus	1	529,843	1	529,843	—	—	—	—
U.S. Agricultural Research Center	1	250,000	—	—	—	—	1	250,000
U.S. Department of Health and Human Services	6	7,403,052	—	4,398,000	—	—	6	3,005,052
U.S. Food and Drug Administration	2	290,000	—	—	—	—	2	290,000
Warren Grant Magnuson Clinical Center	1	150,000	—	—	—	—	1	150,000
Westat, Inc.	2	7,073,683	1	675,297	—	—	1	6,398,386
Total Maryland	**280**	**175,720,173**	**214**	**108,494,277**	**22**	**5,177,332**	**44**	**62,048,564**
Massachusetts								
ABIOMED, Inc.	1	99,838	1	99,838	—	—	—	—
Aerodyne Research, Inc.	1	99,926	1	99,926	—	—	—	—
American Red Cross Blood Services	1	993,866	—	—	—	—	1	993,866
Baystate Medical Center	2	322,484	—	—	—	—	2	322,484
Beth Israel Deaconess Medical Center	49	19,104,489	42	17,960,506	7	1,143,983	—	—
BioPhysics Assay Laboratory, Inc. (BioPAL)	2	590,031	2	590,031	—	—	—	—
BioSurfaces	1	375,000	1	375,000	—	—	—	—
Boston Biomedical Research Institute	7	2,840,659	6	2,787,167	1	53,492	—	—
Boston Medical Center	13	8,458,208	13	8,458,208	—	—	—	—
Boston University, Charles River Campus	6	2,134,749	6	2,134,749	—	—	—	—
Boston University Medical Campus	56	30,455,382	46	28,028,601	9	2,012,920	1	413,861
Brandeis University	1	105,220	1	105,220	—	—	—	—
Brigham and Women's Hospital	141	70,129,455	121	64,851,376	17	3,457,826	3	1,820,253
Cardiovascular Engineering, Inc.	1	295,447	1	295,447	—	—	—	—
Cardium Pharmaceuticals, Inc.	1	287,357	1	287,357	—	—	—	—
CBR Institute for Biomedical Research	9	13,177,521	9	13,177,521	—	—	—	—
Cell Imaging Systems, LLC	1	149,800	1	149,800	—	—	—	—
Children's Hospital Boston	50	22,941,245	46	21,423,267	4	1,517,978	—	—
Dana-Farber Cancer Institute	14	5,798,235	14	5,798,235	—	—	—	—
EIC Laboratories, Inc.	2	835,774	2	835,774	—	—	—	—
Grady Research, Inc.	1	105,250	1	105,250	—	—	—	—
GTC Biotherapeutics, Inc.	2	643,426	2	643,426	—	—	—	—
Gwathmey, Inc.	1	681,067	1	681,067	—	—	—	—
Harvard Pilgrim Health Care, Inc.	2	744,779	2	744,779	—	—	—	—
Harvard University	2	539,056	1	481,520	1	57,536	—	—
Harvard University Medical School	11	3,769,058	7	2,763,354	4	1,005,704	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Harvard University School of Public Health	25	13,512,524	23	12,996,000	2	516,524	—	—
Howard M. Sharipo, M.D., P.C.	1	96,573	1	96,573	—	—	—	—
Infoscitex Corporation	1	390,086	1	390,086	—	—	—	—
Inotek Pharmacueticals Corporation	3	878,416	3	878,416	—	—	—	—
Joslin Diabetes Center	2	1,034,112	2	1,034,112	—	—	—	—
Levitronix, LLC	2	1,163,616	2	1,163,616	—	—	—	—
Massachusetts Eye and Ear Infirmary	1	125,982	1	125,982	—	—	—	—
Massachusetts General Hospital	79	31,140,830	73	28,137,213	5	1,392,659	1	1,610,958
Massachusetts Institute of Technology	14	8,382,099	12	8,296,055	2	86,044	—	—
Massachusetts Mental Health Institute	1	200,550	1	200,550	—	—	—	—
Microbiotix, Inc.	1	304,821	1	304,821	—	—	—	—
New England Medical Center Hospitals	32	20,915,413	29	20,096,798	2	669,092	1	149,523
New England Research Institutes, Inc.	4	9,714,025	3	4,552,279	—	—	1	5,161,746
Newton Laboratories	1	376,453	1	376,453	—	—	—	—
NMT Medical, Inc.	1	137,500	1	137,500	—	—	—	—
Northeastern University	2	415,973	2	415,973	—	—	—	—
Plethlogic	1	149,268	1	149,268	—	—	—	—
QuitNet.com, Inc.	1	432,394	1	432,394	—	—	—	—
Radiation Monitoring Devices, Inc.	3	574,995	3	574,995	—	—	—	—
Science Research Laboratory, Inc.	1	305,855	1	305,855	—	—	—	—
SonarMed, Inc.	1	100,000	1	100,000	—	—	—	—
Spaulding Rehabilitation Hospital	1	224,750	1	224,750	—	—	—	—
St. Elizabeth's Medical Center of Boston	3	1,207,582	3	1,207,582	—	—	—	—
Thermal Technologies, Inc.	1	333,594	1	333,594	—	—	—	—
Tufts University, Boston	10	3,019,174	8	2,731,617	2	287,557	—	—
University of Massachusetts, Amherst	1	331,392	1	331,392	—	—	—	—
University of Massachusetts Medical School, Worcester	24	8,286,262	21	7,283,915	2	158,981	1	843,366
V.I. Technologies, Inc.	1	284,595	1	284,595	—	—	—	—
Whitehead Institute for Biomedical Research	1	48,296	—	—	1	48,296	—	—
Williams College	1	200,786	1	200,786	—	—	—	—
Total Massachusetts	**598**	**289,965,238**	**528**	**266,240,589**	**59**	**12,408,592**	**11**	**11,316,057**
Michigan								
Accumed Systems, Inc.	1	401,655	1	401,655	—	—	—	—
Henry Ford Health System	13	5,856,821	13	5,856,821	—	—	—	—
Hope College	—	5,000	—	5,000	—	—	—	—
L. VAD Technology, Inc.	1	298,360	1	298,360	—	—	—	—
MC3, Inc.	6	2,837,072	6	2,837,072	—	—	—	—
MedArray, Inc.	2	336,969	2	336,969	—	—	—	—
Michigan State University	11	3,964,840	10	3,960,881	1	3,959	—	—
Michigan Technological University	1	227,000	1	227,000	—	—	—	—
Neural Intervention Technologies, Inc.	1	586,294	1	586,294	—	—	—	—
Oakland University	1	71,000	1	71,000	—	—	—	—
Pixel Velocity, Inc.	1	490,506	1	490,506	—	—	—	—
St. Joseph Mercy Oakland	2	544,029	2	544,029	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Thromgen, Inc.	1	877,297	1	877,297	—	—	—	—
University of Michigan at Ann Arbor	96	40,258,076	85	37,578,051	9	1,544,022	2	1,136,003
Wayne State University	17	4,865,307	16	4,482,598	—	—	1	382,709
Western Michigan University	1	1	1	1	—	—	—	—
Total Michigan	**155**	**61,620,227**	**142**	**58,553,534**	**10**	**1,547,981**	**3**	**1,518,712**
Minnesota								
Advanced Circulatory Systems, Inc.	2	1,172,832	2	1,172,832	—	—	—	—
Advanced Medical Electronics Corporation	3	1,106,579	3	1,106,579	—	—	—	—
Applied Membrane Technology, Inc.	1	161,854	1	161,854	—	—	—	—
Discovery Genomics, Inc.	1	595,423	1	595,423	—	—	—	—
HealthPartners Research Foundation	1	322,290	1	322,290	—	—	—	—
Innovative Surface Technologies, LLC	1	376,644	1	376,644	—	—	—	—
Koronis Biomedical Technologies Corporation	1	121,242	1	121,242	—	—	—	—
Korosensor.com, Inc.	1	285,902	1	285,902	—	—	—	—
Mayo Clinic College of Medicine, Rochester	62	26,463,161	53	24,046,487	5	885,063	4	1,531,611
Medical Innovations International, Inc.	2	362,850	2	362,850	—	—	—	—
Minneapolis Medical Research Foundation, Inc.	1	4,087,222	—	—	—	—	1	4,087,222
Minnesota Veterans Research Institute	1	482,312	1	482,312	—	—	—	—
Nanocopoeia, Inc.	1	261,033	1	261,033	—	—	—	—
Paradigm Pharmaceuticals, LLC	1	378,050	1	378,050	—	—	—	—
Powerscope, Inc.	1	100,000	1	100,000	—	—	—	—
University of Minnesota, Duluth	1	223,107	1	223,107	—	—	—	—
University of Minnesota, Twin Cities	74	31,464,623	61	26,047,349	8	2,030,840	5	3,386,434
ZirChrom Separations, Inc.	1	360,373	1	360,373	—	—	—	—
Total Minnesota	**156**	**68,325,497**	**133**	**56,404,327**	**13**	**2,915,903**	**10**	**9,005,267**
Mississippi								
Jackson Hinds Comprehensive Health Center	1	440,438	1	440,438	—	—	—	—
Jackson State University	1	2,503,651	—	—	—	—	1	2,503,651
Tougaloo College	1	725,495	—	—	—	—	1	725,495
University of Mississippi Medical Center	13	6,897,406	6	3,893,776	5	227,476	2	2,776,154
University of Southern Mississippi	1	196,920	1	196,920	—	—	—	—
Total Mississippi	**17**	**10,763,910**	**8**	**4,531,134**	**5**	**227,476**	**4**	**6,005,300**
Missouri								
Children's Mercy Hospital, Kansas City	2	331,893	2	331,893	—	—	—	—
EVAS Therapeutics, LLC	1	152,652	1	152,652	—	—	—	—
Proteon Therapeutics, LLC	1	99,510	1	99,510	—	—	—	—
St. Louis University	12	3,264,326	11	3,264,326	—	—	1	—
University of Missouri, Columbia	14	3,672,451	13	3,637,139	1	35,312	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
University of Missouri, Kansas City	1	257,250	1	257,250	—	—	—	—
ViraCor Holdings	1	299,000	1	299,000	—	—	—	—
Washington University	127	58,898,909	116	56,667,563	11	2,231,346	—	—
Total Missouri	**159**	**66,975,991**	**146**	**64,709,333**	**12**	**2,266,658**	**1**	—
Montana								
Montana State University, Bozeman	1	394,771	1	394,771	—	—	—	—
University of Montana	5	1,580,636	5	1,580,636	—	—	—	—
Total Montana	**6**	**1,975,407**	**6**	**1,975,407**	**—**	**—**	**—**	**—**
Nebraska								
Creighton University	4	729,818	3	689,085	1	40,733	—	—
University of Nebraska, Lincoln	1	2,002,142	1	2,002,142	—	—	—	—
University of Nebraska Medical Center	7	4,835,319	7	4,835,319	—	—	—	—
Ximerex, Inc.	1	560,331	1	560,331	—	—	—	—
Total Nebraska	**13**	**8,127,610**	**12**	**8,086,877**	**1**	**40,733**	**—**	**—**
Nevada								
Nevada Cancer Institute	1	338,528	1	338,528	—	—	—	—
Sierra Biomedical Research Corporation	2	765,764	2	765,764	—	—	—	—
University of Nevada at Reno	12	4,278,123	11	3,522,166	—	—	1	755,957
Total Nevada	**15**	**5,382,415**	**14**	**4,626,458**	**—**	**—**	**1**	**755,957**
New Hampshire								
Creare, Inc.	2	472,878	2	472,878	—	—	—	—
Dartmouth College	18	5,824,794	18	5,824,794	—	—	—	—
Xemed, LLC	1	371,346	1	371,346	—	—	—	—
Total New Hampshire	**21**	**6,669,018**	**21**	**6,669,018**	—	—	—	—
New Jersey								
Advanced Liquid Crystal Technologies, Inc.	1	256,131	1	256,131	—	—	—	—
COECare.com, LLC	2	464,801	2	464,801	—	—	—	—
DVX, LLC	1	430,469	1	460,469	—	—	—	—
Hackensack University Medical Center	2	736,250	2	736,250	—	—	—	—
Life Recovery Systems, Inc.	1	591,581	1	591,581	—	—	—	—
Medarex, Inc.	1	100,000	1	100,000	—	—	—	—
Onconova Therapeutics, Inc.	1	218,796	1	218,796	—	—	—	—
PharmaSeq, Inc.	1	373,162	1	373,162	—	—	—	—
Princeton University	1	298,871	1	298,871	—	—	—	—
Provid Pharmaceuticals, Inc.	1	132,414	1	132,414	—	—	—	—
Public Health Research Institute	3	1,093,542	3	1,093,542	—	—	—	—
Rutgers, The State University of New Jersey, New Brunswick	1	107,730	1	170,730	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
University of Medicine and Dentistry of New Jersey	19	10,292,535	15	9,211,774	3	627,561	1	453,200
University of Medicine and Dentistry of New Jersey, R.W. Johnson Medical School	8	5,292,617	8	5,292,617	—	—	—	—
Total New Jersey	**43**	**20,388,899**	**39**	**19,308,138**	**3**	**627,561**	**1**	**453,200**
New Mexico								
Department of Veterans Affairs, Albuquerque	1	3,673,347	—	—	—	—	1	3,673,347
Diné College	1	417,762	1	417,762	—	—	—	—
Lovelace Biomedical and Environmental Research	6	2,514,297	5	2,486,540	1	27,757	—	—
Sandia National Laboratories	1	140,567	1	140,567	—	—	—	—
TPL, Inc.	1	378,781	1	378,781	—	—	—	—
University of New Mexico, Albuquerque	11	4,180,089	9	3,802,487	2	377,602	—	—
Total New Mexico	**21**	**11,304,843**	**17**	**7,226,137**	**3**	**405,359**	**1**	**3,673,347**
New York								
Aaron Diamond AIDS Research Center	1	636,721	1	636,721	—	—	—	—
Albany Medical College of Union University	6	1,909,438	4	1,382,500	2	526,938	—	—
Albany Research Institute, Inc.	1	250,000	1	250,000	—	—	—	—
Angion Biomedica Corporation	1	225,829	1	225,829	—	—	—	—
Cell Preservation Services, Inc.	1	408,632	1	408,632	—	—	—	—
Chylos, Inc.	1	100,000	1	100,000	—	—	—	—
City College of New York	2	757,150	2	757,150	—	—	—	—
Clarkson University	1	217,756	1	217,756	—	—	—	—
Cold Spring Harbor Laboratory	1	15,000	1	15,000	—	—	—	—
Columbia University	84	44,274,277	74	40,908,358	8	1,334,978	2	2,030,941
Cornell University, Ithaca	9	4,127,772	8	4,079,476	1	48,296	—	—
CUNY Graduate School and University Center	1	359,949	1	359,949	—	—	—	—
Dawkins Productions, Inc.	1	509,336	1	509,336	—	—	—	—
ECG-Tech Corporation	1	98,480	1	98,480	—	—	—	—
Gene Network Sciences, Inc.	2	237,760	2	237,760	—	—	—	—
GentCorp, Ltd.	1	213,435	1	213,435	—	—	—	—
Graduate College of Union University	—	80,000	—	80,000	—	—	—	—
Hospital for Special Surgery	1	503,910	1	503,910	—	—	—	—
Ithaca College	1	209,705	1	209,705	—	—	—	—
Jarvik Heart, Inc.	1	726,610	—	—	—	—	1	726,610
Masonic Medical Research Laboratory, Inc.	2	576,221	2	576,221	—	—	—	—
Mohawk Innovative Technology, Inc.	2	1,297,065	2	1,297,065	—	—	—	—
Montefiore Medical Center, Bronx	1	337,309	1	337,309	—	—	—	—
Mount Sinai School of Medicine of New York University	26	18,836,780	23	15,359,120	2	96,592	1	3,381,068
Nanoprobes, Inc.	1	495,435	1	495,435	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Narrows Institute for Biomedical Research, Inc.	2	314,632	1	300,750	1	13,882	—	—
National Neurofibromatosis Foundation	—	10,000	—	10,000	—	—	—	—
New York Academy of Medicine	1	549,315	1	549,315	—	—	—	—
New York Academy of Sciences	2	25,000	2	25,000	—	—	—	—
New York Blood Center	5	2,654,176	5	2,654,176	—	—	—	—
New York Medical College	14	8,357,597	14	8,357,597	—	—	—	—
New York University School of Medicine	29	9,933,072	25	9,461,141	4	471,931	—	—
North Shore–Long Island Jewish Research Institute	5	1,763,270	5	1,763,270	—	—	—	—
Ogilvy Public Relations Worldwide	3	2,792,953	—	—	—	—	3	2,792,953
Pharmacon International, Inc.	1	396,986	1	396,986	—	—	—	—
Photon Migration Technologies Corporation	1	167,408	1	167,408	—	—	—	—
Rockefeller University	6	2,198,143	5	2,149,847	1	48,296	—	—
Sloan-Kettering Institute for Cancer Research	7	1,810,661	7	1,810,661	—	—	—	—
State University of New York at Buffalo	13	5,337,918	11	4,032,306	1	43,757	1	1,261,855
State University of New York at Stony Brook	16	5,063,068	15	4,434,816	—	—	1	628,252
St. John's University	1	698,520	1	698,520	—	—	—	—
St. Luke's–Roosevelt Institute for Health Sciences	8	2,592,549	7	2,548,573	1	43,976	—	—
SUNY Downstate Medical Center	4	1,032,750	4	1,032,750	—	—	—	—
Syracuse University	1	375,000	1	375,000	—	—	—	—
Therasource, LLC	1	149,995	1	149,995	—	—	—	—
Transonic Systems, Inc.	1	100,000	1	100,000	—	—	—	—
Trudeau Institute, Inc.	2	2,221,711	2	2,221,711	—	—	—	—
University of Rochester	43	19,613,227	39	18,722,196	4	891,031	—	—
Upstate Medical Center	7	2,598,196	7	2,598,196	—	—	—	—
Vasade Biosciences, Inc.	2	268,027	2	268,027	—	—	—	—
Visiting Nurse Service of New York	1	730,487	1	730,487	—	—	—	—
Weill Medical College of Cornell University	49	32,290,660	47	29,216,404	1	337,631	1	2,736,625
Winthrop-University Hospital	2	490,934	2	490,934	—	—	—	—
Yeshiva University	31	16,707,593	25	14,787,363	5	481,554	1	1,438,676
Zylon Corporation	1	785,046	1	785,046	—	—	—	—
Total New York	**408**	**199,433,464**	**366**	**180,097,622**	**31**	**4,338,862**	**11**	**14,996,980**
North Carolina								
BioMarck Pharmaceuticals	1	596,400	1	596,400	—	—	—	—
BreathQuant Medical Systems, Inc.	1	536,828	1	536,828	—	—	—	—
Carolinas Medical Center	1	380,429	1	380,429	—	—	—	—
Cognosci, Inc.	1	286,564	1	286,564	—	—	—	—
Duke University	123	60,836,476	105	58,498,105	15	2,022,037	3	316,334
East Carolina University	1	124,665	1	124,665	—	—	—	—
Endacea, Inc.	1	316,067	1	316,067	—	—	—	—
Ercole Biotech, Inc.	1	588,563	1	588,563	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Heart Imaging Technologies, LLC	1	269,926	1	269,926	—	—	—	—
North Carolina Central University	1	291,234	1	291,234	—	—	—	—
North Carolina State University at Raleigh	5	1,694,002	4	1,448,363	1	245,639	—	—
Parion Sciences, Inc.	1	364,501	1	364,501	—	—	—	—
Rho Federal Systems Division, Inc.	2	5,857,309	2	5,857,309	—	—	—	—
Tribofilm Research, Inc.	1	372,274	1	372,274	—	—	—	—
University of North Carolina at Chapel Hill	85	38,371,548	75	34,956,911	7	1,153,785	3	2,260,852
University of North Carolina at Charlotte	1	462,329	1	462,329	—	—	—	—
University of North Carolina at Greensboro	1	121,133	1	121,133	—	—	—	—
Wake Forest University	5	1,737,762	5	1,737,762	—	—	—	—
Wake Forest University Health Sciences	38	31,239,410	31	15,761,402	2	317,320	5	15,160,688
Winston-Salem State University	1	119,333	1	119,333	—	—	—	—
Total North Carolina	**272**	**144,566,753**	**236**	**123,090,098**	**25**	**3,738,781**	**11**	**17,737,874**
North Dakota								
University of North Dakota	1	300,688	1	300,688	—	—	—	—
Total North Dakota	**1**	**300,688**	**1**	**300,688**	**—**	**—**	**—**	**—**
Ohio								
Arteriocyte, Inc.	1	142,954	1	142,954	—	—	—	—
BIOMEC, Inc.	2	1,493,914	2	1,493,914	—	—	—	—
Case Western Reserve University	56	28,339,013	47	19,015,806	8	2,634,640	1	6,688,567
ChanXpress, Inc.	1	659,605	1	659,605	—	—	—	—
Children's Hospital Medical Center of Cincinnati	49	26,467,928	47	26,274,849	2	193,079	—	—
Children's Research Institute	3	571,136	3	571,136	—	—	—	—
Cleveland Clinic Foundation	2	113,337	—	—	—	—	2	113,337
Cleveland Clinic Lerner College of Medicine of Case Western Reserve University	56	27,680,588	52	26,654,234	2	103,096	2	923,258
Cleveland Medical Devices, Inc.	2	801,362	2	801,362	—	—	—	—
Cleveland State University	2	500,110	2	500,110	—	—	—	—
Deca-Medics, Inc.	1	512,873	1	512,873	—	—	—	—
Dessinier Corporation	1	105,000	1	105,000	—	—	—	—
Enable Medical Corporation	1	185,856	1	185,856	—	—	—	—
ICON Interventional Systems, Inc.	1	106,559	1	106,559	—	—	—	—
Interventional Imaging, Inc.	1	266,006	1	266,006	—	—	—	—
International Society for Applied Cardiovascular Biology	1	10,000	1	10,000	—	—	—	—
LAM Foundation	1	15,000	1	15,000	—	—	—	—
Medical College of Ohio at Toledo	7	6,852,826	7	6,852,826	—	—	—	—
MetroHealth Medical Center	2	387,428	1	337,500	1	49,928	—	—
NanoMimetics, Inc.	1	199,347	1	199,347	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Northeastern Ohio Universities College of Medicine	1	231,000	1	231,000	—	—	—	—
NovelMed Therapeutics, Inc.	2	415,059	2	415,059	—	—	—	—
Ohio State University	34	10,351,483	31	9,691,167	1	51,548	2	608,768
PMI Industries, Inc.	1	229,748	1	229,748	—	—	—	—
University of Akron	2	577,190	2	577,190	—	—	—	—
University of Cincinnati	42	18,521,289	37	16,433,628	3	574,414	2	1,513,247
Wright State University	6	2,539,403	4	2,384,797	2	154,606	—	—
Total Ohio	**279**	**128,276,014**	**251**	**114,667,526**	**19**	**3,761,311**	**9**	**9,847,177**
Oklahoma								
Ekips Technologies, Inc.	1	376,393	1	376,393	—	—	—	—
Langston University	1	500,000	1	500,000	—	—	—	—
Oklahoma Medical Research Foundation	5	3,226,967	5	3,226,967	—	—	—	—
Oklahoma State University, Stillwater	2	607,200	2	607,200	—	—	—	—
University of Oklahoma Health Sciences Center	10	4,646,079	10	4,646,079	—	—	—	—
Total Oklahoma	**19**	**9,356,639**	**19**	**9,356,639**	**—**	**—**	**—**	**—**
Oregon								
Dimera, LLC	2	1,285,950	2	1,285,950	—	—	—	—
Oregon Center for Applied Science, Inc.	1	165,573	1	165,573	—	—	—	—
Oregon Health and Science University	39	14,389,045	33	13,697,207	6	691,838	—	—
Oregon Research Institute	3	1,090,644	3	1,090,644	—	—	—	—
Oregon State University	1	309,059	1	309,059	—	—	—	—
Portland State University	1	355,000	1	355,000	—	—	—	—
University of Oregon	2	429,660	2	429,660	—	—	—	—
Total Oregon	**49**	**18,024,931**	**43**	**17,333,093**	**6**	**691,838**	**—**	**—**
Pennsylvania								
Allegheny-Singer Research Institute	2	582,871	2	582,871	—	—	—	—
CardiacAssist, Inc.	1	479,743	1	479,743	—	—	—	—
Carnegie Mellon University	4	1,292,267	4	1,292,267	—	—	—	—
CASurgica, Inc.	1	633,241	1	633,241	—	—	—	—
Children's Hospital of Philadelphia	41	26,661,844	39	26,100,177	2	561,667	—	—
Children's Hospital of Pittsburgh	7	2,059,585	7	2,059,585	—	—	—	—
CollaGenex Pharmaceuticals, Inc.	1	719,101	1	719,101	—	—	—	—
Drexel University	1	334,629	1	334,629	—	—	—	—
Drexel University College of Medicine	5	1,545,084	4	1,461,994	1	83,090	—	—
Ension, Inc.	3	1,121,373	2	587,684	—	—	1	533,689
Fox Chase Cancer Center	1	425,000	1	425,000	—	—	—	—
Institute for Cancer Research	1	477,110	1	477,110	—	—	—	—
Lankenau Medical Research Center	1	400,000	1	400,000	—	—	—	—
Magee-Women's Health Corporation	1	14,721	—	—	1	14,721	—	—
Medical Diagnostic Research Foundation	1	306,499	1	306,499	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Membrane Assays, Inc.	—	61,760	—	61,760	—	—	—	—
National Disease Research Interchange	—	25,000	—	25,000	—	—	—	—
Octagen Corporation	1	1,004,225	1	1,004,225	—	—	—	—
Pennsylvania State University, Milton S. Hershey Medical Center	25	13,293,446	24	12,471,024	—	—	1	822,422
Pennsylvania State University, University Park	3	863,713	3	863,713	—	—	—	—
Separation Design Group, LLC	1	152,977	1	152,977	—	—	—	—
Temple University	19	6,253,266	15	5,730,649	3	437,463	1	85,154
The Institute for Transfusion Medicine	1	702,405	—	—	—	—	1	702,405
Thomas Jefferson University	16	6,617,607	15	6,600,901	1	16,706	—	—
University of Pennsylvania	125	61,761,842	107	57,695,492	18	4,066,350		
University of Pittsburgh at Pittsburgh	106	54,269,363	86	48,266,519	15	1,609,458	5	4,393,386
Wistar Institute	4	2,554,000	4	2,554,000	—	—	—	—
Total Pennsylvania	**372**	**184,612,672**	**322**	**171,286,161**	**41**	**6,789,455**	**9**	**6,537,056**
Rhode Island								
Brown University	6	2,834,700	5	2,776,699	1	58,001	—	—
Gordon Research Conferences	8	155,000	8	155,000	—	—	—	—
Memorial Hospital of Rhode Island	2	1,370,537	1	582,210	—	—	1	788,327
Miriam Hospital	10	3,410,607	9	3,366,631	1	43,976	—	—
Pro-Change Behavior Systems, Inc.	3	1,070,412	3	1,070,412	—	—	—	—
Rhode Island Hospital, Providence	4	2,314,744	4	2,314,744	—	—	—	—
Roger Williams Hospital	2	580,108	2	580,108	—	—	—	—
Total Rhode Island	**35**	**11,736,108**	**32**	**10,845,804**	**2**	**101,977**	**1**	**788,327**
South Carolina								
Clemson University	2	583,500	2	583,500	—	—	—	—
Medical University of South Carolina	33	12,628,572	27	11,144,088	4	735,732	2	748,752
Organ Recovery Systems, Inc.	1	410,890	1	410,890	—	—	—	—
University of South Carolina at Columbia	13	4,797,219	13	4,797,219	—	—	—	—
Total South Carolina	**49**	**18,420,181**	**43**	**16,935,697**	**4**	**735,732**	**2**	**748,752**
South Dakota								
Missouri Breaks Research, Inc.	1	920,557	1	920,557	—	—	—	—
South Dakota Health Research Foundation	1	276,675	1	276,675	—	—	—	—
University of South Dakota	1	351,250	1	351,250	—	—	—	—
Total South Dakota	**3**	**1,548,482**	**3**	**1,548,482**	**—**	**—**	**—**	**—**
Tennessee								
Cumberland Pharmaceuticals, Inc.	1	256,807	1	256,807	—	—	—	—
East Tennessee State University	4	1,121,731	4	1,121,731	—	—	—	—
Meharry Medical College	5	1,733,800	3	1,208,599	2	525,201	—	—
St. Jude Children's Research Hospital	10	8,982,098	9	8,747,697	—	—	1	234,401

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
University of Memphis	4	2,456,494	4	2,456,494	—	—	—	—
University of Tennessee at Knoxville	2	507,150	2	507,150	—	—	—	—
University of Tennessee Health Sciences Center	29	9,766,849	27	8,509,533	1	75,605	1	1,181,711
Vanderbilt University	79	36,729,208	67	34,238,291	10	2,100,504	2	390,413
Veterans Affairs Medical Center, Memphis	1	2,798,664	—	—	—	—	1	2,798,664
Total Tennessee	**135**	**64,352,801**	**117**	**57,046,302**	**13**	**2,701,310**	**5**	**4,605,189**
Texas								
Baylor College of Medicine	91	34,736,285	75	29,739,378	12	2,374,684	4	2,622,223
Baylor Research Institute	1	338,199	1	338,199	—	—	—	—
Cardiovascular Biosciences, Inc.	1	525,646	1	525,646	—	—	—	—
Cooper Institute for Aerobics Research	3	1,373,056	3	1,373,056	—	—	—	—
Corinnova, Inc.	1	99,998	1	99,998	—	—	—	—
Encysive Pharmaceuticals	1	100,000	1	100,000	—	—	—	—
Lexicon Genetics, Inc.	1	1,000,000	—	—	—	—	1	1,000,000
Lynntech, Inc.	4	663,327	4	663,327	—	—	—	—
MicroFab Technologies, Inc.	1	148,700	1	148,700	—	—	—	—
Millar Instruments, Inc.	2	377,811	2	377,811	—	—	—	—
Raman Systems, Inc.	1	100,031	1	100,031	—	—	—	—
Rice University	1	188,750	1	188,750	—	—	—	—
Southwest Foundation for Biomedical Research	7	9,175,992	7	9,175,992	—	—	—	—
Texas A&M University Health Science Center	14	5,792,304	13	5,734,768	1	57,536	—	—
Texas A&M University System	4	957,778	4	957,778	—	—	—	—
Texas Engineering Experiment Station	2	980,788	2	980,788	—	—	—	—
University of North Texas Health Sciences Center	7	2,054,228	6	1,918,450	1	135,778	—	—
University of Texas at Austin	3	527,729	2	477,801	1	49,928	—	—
University of Texas at Dallas	2	642,465	2	642,465	—	—	—	—
University of Texas at San Antonio	1	303,435	1	303,435	—	—	—	—
University of Texas Health Sciences Center at Houston	25	15,025,032	23	14,728,703	1	54,930	1	241,399
University of Texas Health Sciences Center at San Antonio	21	8,665,419	18	7,752,219	2	286,577	1	626,623
University of Texas Health Sciences Center at Tyler	8	3,436,272	8	3,436,272	—	—	—	—
University of Texas M.D. Anderson Cancer Center	8	2,949,798	8	2,949,798	—	—	—	—
University of Texas Medical Branch at Galveston	15	5,077,330	13	4,449,860	1	85,633	1	541,837
University of Texas of the Permian Basin	1	209,995	1	209,995	—	—	—	—
University of Texas–Pan American	—	381,463	—	381,463	—	—	—	—
University of Texas Southwestern Medical Center at Dallas	49	24,276,648	43	22,473,772	5	1,158,863	1	644,013
Total Texas	**275**	**120,108,479**	**242**	**110,228,455**	**24**	**4,203,929**	**9**	**5,676,095**

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Utah								
Frontier Scientific, Inc.	1	535,348	1	535,348	—	—	—	—
LDS Hospital	3	901,322	1	575,237	—	—	2	326,085
Thrombodyne, Inc.	1	979,404	1	979,404	—	—	—	—
University of Utah	45	15,033,607	40	14,191,711	5	841,896	—	—
Utah Artificial Heart Institute	1	1,190,510	1	1,190,510	—	—	—	—
Total Utah	**51**	**18,640,191**	**44**	**17,472,210**	**5**	**841,896**	**2**	**326,085**
Vermont								
Haematologic Technologies, Inc.	2	518,238	2	518,238	—	—	—	—
Psychological Applications, LLC	1	106,566	1	106,566	—	—	—	—
University of Vermont and State Agricultural College	42	16,648,258	36	15,502,510	5	779,859	1	365,889
Total Vermont	**45**	**17,273,062**	**39**	**16,127,314**	**5**	**779,859**	**1**	**365,889**
Virginia								
Adenosine Therapeutics, LLC	2	1,099,925	2	1,099,925	—	—	—	—
American Psychosomatic Society	1	10,000	1	10,000	—	—	—	—
Eastern Virginia Medical School	2	465,605	2	465,605	—	—	—	—
Empirical Technologies Corporation	1	276,693	1	276,693	—	—	—	—
Formatta Corporation	—	500,000	—	500,000	—	—	—	—
George Mason University	1	142,234	1	142,234	—	—	—	—
Hampton University	—	100,682	—	100,682	—	—	—	—
National Science Foundation	1	78,039	—	—	—	—	1	78,039
SonoMedica, LLC	1	100,000	1	100,000	—	—	—	—
Talisman, Ltd.	1	910,764	1	910,764	—	—	—	—
University of Virginia, Charlottesville	56	24,545,787	46	23,012,939	9	1,453,232	1	79,616
Virginia Commonwealth University	14	4,514,623	14	4,514,623	—	—	—	—
Virginia Polytechnic Institute and State University	1	149,206	1	149,206	—	—	—	—
Total Virginia	**81**	**32,893,558**	**70**	**31,282,671**	**9**	**1,453,232**	**2**	**157,655**
Washington								
Asthma Inc.	1	261,514	1	261,514	—	—	—	—
Axio Research Corporation	1	1	1	1	—	—	—	—
Barlow Scientific	2	475,000	2	475,000	—	—	—	—
Battelle Pacific Northwest Laboratories	1	2,002,622	1	2,002,622	—	—	—	—
Catch, Inc.	1	279,310	1	279,310	—	—	—	—
Children's Hospital and Medical Center	5	2,519,901	5	2,519,901	—	—	—	—
Fred Hutchinson Cancer Research Center	17	16,778,509	14	8,188,237	1	55,352	2	8,534,920
Group Health Cooperative of Puget Sound	1	699,767	1	699,767	—	—	—	—
Inologic, Inc.	1	493,160	1	493,160	—	—	—	—
Insilicos, LLC	1	198,415	1	198,415	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Institute for Systems Biology	2	843,327	1	122,487	—	—	1	720,840
MicroPlumbers Microsciences, LLC	1	100,000	1	100,000	—	—	—	—
Omeros Corporation	1	127,000	1	127,000	—	—	—	—
Pathway Medical Technologies, Inc.	1	460,988	1	460,988	—	—	—	—
Phantoms by Design, Inc.	2	751,670	2	751,670	—	—	—	—
Pro-Tech Services, Inc.	1	198,287	1	198,287	—	—	—	—
Puget Sound Blood Center	5	3,008,031	4	2,950,495	1	57,536	—	—
Seattle Institute for Cardiac Research	1	1,800,742	1	1,800,742	—	—	—	—
Spencer Technologies	2	637,296	2	637,296	—	—	—	—
Syntrix Biosystems, Inc.	1	711,818	1	711,818	—	—	—	—
University of Washington	126	67,590,827	110	58,599,668	10	3,185,728	6	5,805,431
VisionGate, Inc.	1	199,200	1	199,200	—	—	—	—
Washington State University	4	1,746,292	4	1,746,292	—	—	—	—
Western Washington University	1	180,133	1	180,133	—	—	—	—
Total Washington	**180**	**102,063,810**	**159**	**83,704,003**	**12**	**3,298,616**	**9**	**15,061,191**
West Virginia								
West Virginia University	6	2,281,956	6	2,281,956	—	—	—	—
Total West Virginia	**6**	**2,281,956**	**6**	**2,281,956**	**—**	**—**	**—**	**—**
Wisconsin								
American Society of Gene Therapy	1	10,000	1	10,000	—	—	—	—
Blood Center of Southeastern Wisconsin	10	3,777,283	8	2,759,935	1	43,895	1	973,453
Marquette University	1	217,500	1	217,500	—	—	—	—
Marshfield Clinic	1	3,749,999	—	—	—	—	1	3,749,999
Medical College of Wisconsin	67	33,013,688	60	31,397,075	5	592,275	2	1,024,338
SpectroCon, LLC	1	406,549	1	406,549	—	—	—	—
University of Wisconsin, Madison	47	20,821,307	42	18,968,089	4	1,194,003	1	659,215
WiCell Research Institute	—	100,000	—	100,000	—	—	—	—
Total Wisconsin	**128**	**62,096,326**	**113**	**53,859,148**	**10**	**1,830,173**	**5**	**6,407,005**
Puerto Rico								
Universidad Central del Caribe	—	172,925	—	172,925	—	—	—	—
University of Puerto Rico, Mayaguez	—	162,675	—	162,675	—	—	—	—
University of Puerto Rico, Medical Sciences	1	744,201	1	744,201	—	—	—	—
Total Puerto Rico	**1**	**1,079,801**	**1**	**1,079,801**	**—**	**—**	**—**	**—**
Total U.S.	**5,563**	**2,587,760,340**	**4,880**	**2,297,683,554**	**483**	**87,424,194**	**200**	**202,652,592**
Argentina								
National University of Cordoba	1	36,532	—	—	1	36,532	—	—
Total Argentina	**1**	**36,532**	**—**	**—**	**1**	**36,532**	**—**	**—**

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Australia								
ES Cell International Pte Ltd.	—	100,000	—	100,000	—	—	—	—
Howard Florey Institute	1	402,306	1	402,306	—	—	—	—
James Cook University of North Queensland	1	270,000	1	270,000	—	—	—	—
National Centre/HIV Epidemiology Clinical Research	1	200,000	1	200,000	—	—	—	—
Royal Melbourne Hospital	1	270,000	1	270,000	—	—	—	—
St. Vincent's Hospital, Melbourne	1	216,000	1	216,000	—	—	—	—
University of Melbourne	2	227,000	2	227,000	—	—	—	—
University of Sydney	1	209,600	1	209,600	—	—	—	—
University of Western Australia	1	216,000	1	216,000	—	—	—	—
Victor Chang Cardiac Research Institute	1	83,323	1	83,323	—	—	—	—
Total Australia	**10**	**2,194,229**	**10**	**2,194,229**	**—**	**—**	**—**	**—**
Belgium								
Flanders Interuniversity Institute of Biotechnology	1	175,000	1	175,000	—	—	—	—
Free University of Brussels	1	297,000	1	297,000	—	—	—	—
Total Belgium	**2**	**472,000**	**2**	**472,000**	**—**	**—**	**—**	**—**
Canada								
Clinical Research Institute of Montreal	1	270,000	1	270,000	—	—	—	—
Hospital for Sick Children, Toronto	3	743,975	3	743,975	—	—	—	—
McGill University	1	300,000	1	300,000	—	—	—	—
McMaster University	1	4,541,818	—	—	—	—	1	4,541,818
Ottawa Health Research Institute	1	181,922	1	181,922	—	—	—	—
St. Michael's Hospital	1	206,675	1	206,675	—	—	—	—
University Health Network	1	178,200	1	178,200	—	—	—	—
University of Alberta	2	229,988	2	229,988	—	—	—	—
University of British Columbia	1	270,000	1	270,000	—	—		—
University of Calgary	3	654,998	3	654,998	—	—	—	—
University of Montreal	2	454,574	2	454,574	—	—	—	—
University of Toronto	—	80,000	—	80,000	—	—	—	—
Total Canada	**17**	**8,112,150**	**16**	**3,570,332**	**—**	**—**	**1**	**4,541,818**
China								
Chinese Center, Disease Control and Prevention	—	24,300	—	24,300	—	—	—	—
Total China	**—**	**24,300**	**—**	**24,300**	**—**	**—**	**—**	**—**
Finland								
University of Helsinki	1	270,000	1	270,000	—	—	—	—
Total Finland	**1**	**270,000**	**1**	**270,000**	**—**	**—**	**—**	**—**

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Hungary								
Eotvos Lorand University	—	40,000	—	40,000	—	—	—	—
Total Hungary	—	**40,000**	—	**40,000**	**—**	**—**	**—**	**—**
India								
Center for DNA Fingerprinting/ Diagnostics	—	39,000	—	39,000	—	—	—	—
Total India	—	**39,000**	**—**	**39,000**	**—**	**—**	**—**	**—**
Israel								
Technion-Israel Institute of Technology	2	371,352	1	344,978	1	26,374	—	—
Total Israel	**2**	**371,352**	**1**	**344,978**	**1**	**26,374**	**—**	**—**
Italy								
University of Parma	1	369,028	1	369,028	—	—	—	—
Total Italy	**1**	**369,028**	**1**	**369,028**	**—**	**—**	**—**	**—**
Netherlands								
Erasmus University of Rotterdam	1	216,000	1	216,000	—	—	—	—
Hubrecht Laboratory	1	49,928	—	—	1	49,928	—	—
State University at Groningen	1	270,000	1	270,000	—	—	—	—
Wageningen University	1	486,909	1	486,909	—	—	—	—
Total Netherlands	**4**	**1,022,837**	**3**	**972,909**	**1**	**49,928**	**—**	**—**
Nigeria								
University of Ibadan	—	10,000	—	10,000	—	—	—	—
Total Nigeria	**—**	**10,000**	**—**	**10,000**	**—**	**—**	**—**	**—**
Republic of Korea								
Mizmedi Hospital	—	100,000	—	100,000	—	—	—	—
Total Republic of Korea	—	**100,000**	—	**100,000**	**—**	**—**	**—**	**—**
Russia								
Central Institute for Tuberculosis	1	150,000	1	150,000	—	—	—	—
Total Russia	**1**	**150,000**	**1**	**150,000**	**—**	**—**	**—**	**—**
Sweden								
Karolinska Institute	2	600,836	2	600,836	—	—	—	—
Uppsala University	1	162,000	1	162,000	—	—	—	—
Total Sweden	**3**	**762,836**	**3**	**762,836**	**—**	**—**	**—**	**—**

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Thailand								
Chiang Mai University	—	16,200	—	16,200	—	—	—	—
Total Thailand	**—**	**16,200**	**—**	**16,200**	**—**	**—**	**—**	**—**
United Kingdom								
Royal Free and University College Medical School	1	215,600	1	215,600	—	—	—	—
University of Bristol	1	483,948	1	483,948	—	—	—	—
University of Edinburgh	1	200,000	1	200,000	—	—	—	—
University of London National Heart and Lung Institute	1	346,653	1	346,653	—	—	—	—
University of London University College, London	2	530,533	2	530,533	—	—	—	—
University of Oxford	1	43,976	—	—	1	43,976	—	—
University of Southampton	1	250,787	1	250,787	—	—	—	—
Total United Kingdom	**8**	**2,071,497**	**7**	**2,027,521**	**1**	**43,976**	**—**	**—**
Total Other	**50**	**16,061,961**	**45**	**11,363,333**	**4**	**156,810**	**1**	**4,541,818**
Grand Total	**5,613**	**$2,603,822,301**	**4,925**	**$2,309,046,887**	**487**	**$87,581,004**	**201**	**$207,194,410**

Appendixes

Types of Research Activity

List of Abbreviations and Acronyms

Index

Types of Research Activity

Research Projects

Research Project Grants (R01): To support discrete and specific projects to be performed by one or several investigators in areas of the investigator's particular interests and competencies.

Research Projects (Cooperative Agreements) (U01): To support discrete, circumscribed projects in areas of an investigator's specific interest and competency involving substantial programmatic participation by the NHLBI during performance of the activity.

Research Program Projects (P01): To support broadly based, multidisciplinary, often long-term research projects that have specific major objectives or basic themes directed toward a well-defined research program goal. Usually, a relatively large, organized group of researchers conducts individual subprojects, the results of which help achieve objectives of the program project.

Small Research Grants (R03): To provide limited support for extended analyses of research data generated by clinical trials, population research, and demonstration and education studies.

Academic Research Enhancement Awards (AREA) (R15): To support small-scale research projects conducted by faculty in primarily baccalaureate degree-granting domestic institutions. Awards are for up to $75,000 for direct costs (plus applicable indirect costs) for periods not to exceed 36 months.

Exploratory/Developmental Grants (R21): To encourage the development of new research activities in heart, lung, and blood diseases and sleep disorders program areas.

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.

First Independent Research Support and Transition (FIRST) Award (R29): To provide a sufficient initial period of research support for newly independent biomedical investigators to develop their research capabilities and demonstrate the merit of their research ideas.

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.

Small Business Technology Transfer (STTR) Grants—Phase I (R41): To support cooperative R&D projects between small business concerns and research institutions, limited in time and amount, to establish the technical merit and feasibility of ideas that have potential for commercialization. Awards are made to small business concerns only.

Small Business Technology Transfer (STTR) Grants—Phase II (R42): To support in-depth development of cooperative R&D projects between small business concerns and research institutions, limited in time and amount, whose feasibility has been established in phase I and that have potential for commercialization. Awards are made to small business concerns only.

Small Business Innovation Research (SBIR) Grants, Phase I (R43): To support projects, limited in time and amount, to establish the technical merit and feasibility of research and development ideas that may ultimately lead to commercial products or services.

Small Business Innovation Research (SBIR) Grants, Phase II (R44): To support research project ideas that have been shown to be feasible in phase I and that are likely to result in commercially marketable products or services.

Research Centers

Exploratory Grants (P20): To support planning for new programs, expansion or modification of existing resources, and feasibility studies to explore various approaches to the development of interdisciplinary programs that offer potential solutions to problems of special significance to the mission of the NHLBI.

Center Core Grants (P30): To support shared resources and facilities for basic, clinical, behavioral, and translational research in the prevention, detection, and treatment of HIV infection and AIDS.

Animal (Mammalian and Nonmammalian) Model and Animal and Material Resource Grant (P40): To develop and support animal models, or animal or biological materials resources. Nonmammalian resources include nonmammalian vertebrates, invertebrates, cell systems, and nonbiological systems.

Specialized Centers of Research (SCOR) Grants (P50): To support both basic and clinical research related to an Institute-identified theme. The spectrum of SCOR activities comprises multidisciplinary approaches to specific disease entities or biomedical problem areas. The SCOR grants differ from research program projects in that they are in response to an announcement of programmatic needs of the Institute. Centers may be asked to perform additional studies because of urgently needed information or may serve as a regional or national resource for special purpose research.

Comprehensive Specialized Research Center Grants (U54): To support a large, interrelated biomedical research program focused on a disorder within the Institute's mandate; to initiate and expand community education, screening, and counseling programs; and to educate medical and allied health professionals concerning problems of diagnosis and treatment of specific diseases such as sickle cell anemia.

Research Career Programs

Mentored Research Scientist Development Award for Minority Faculty (K01): To support underrepresented minority faculty members with varying levels of research experience to prepare them for research careers as independent investigators.

Mentored Scientist Development Award in Research Ethics (K01): To provide support for training in research ethics for health professionals working at academic and other health-related institutions in biomedical, behavioral, or public health research, particularly research involving human participants.

Minority Institution Faculty Mentored Research Scientist Development Award (K01): To support faculty members at minority institutions who have the interest and potential to conduct state-of-the-art research in cardiovascular, pulmonary, or hematologic disease, or in sleep disorders.

Independent Scientist Award (K02): To enhance the research capability of promising individuals in the formative stages of their careers of independent research in the sciences related to heart, lung, and blood diseases; blood resources; and sleep disorders.

Research Career Development Award (K04): To foster the development of young scientists with outstanding research potential for careers of independent research in the sciences related to heart, lung, and blood diseases and blood resources. New grants are no longer awarded.

Research Career Award (K06): To assist institutions in supporting established investigators of high competency for the duration of their careers. New grants are no longer awarded.

Academic Award (K07): To support an individual with an academic appointment to introduce or improve a disease curriculum that will enhance the academic or research environment of the applicant institution as well as further the individual's own career. This award series includes the Preventive Cardiology Academic Award, the Preventive Pulmonary Academic Award, the Transfusion Medicine Academic Award, and the Systemic Pulmonary and Vascular Diseases Academic Awards, the Asthma Academic Award, the Tuberculosis Academic Award, the Sleep Academic Award, the Nutrition Academic Award, and the Cultural Competence and Health Disparities Academic Award. Currently, only the Sleep Academic Award and the Cultural Competence and Health Disparities Academic Award programs are being supported.

Clinical Investigator Development Award (K08): To provide an opportunity for clinically trained physicians to develop research skills and gain experience in advanced research methods and experimental approaches in basic and applied sciences relevant to cardiovascular, pulmonary, and hematological diseases. This award was developed to encourage clinical investigators to engage in research in specific areas designated by the Institute.

Physician Scientist Award (K11): To encourage newly trained clinicians to develop independent research skills and experience in one of the fundamental sciences. New grants are no longer awarded.

Minority School Faculty Development Award (K14): To develop faculty investigators at minority schools and to enhance their research capabilities in areas related to heart, lung, and blood diseases; blood resources; and sleep disorders. New grants are no longer awarded.

Research Development Award for Minority Faculty (K14): To encourage the development of minority faculty investigators and to enhance their research capabilities in areas related to cardiovascular, lung, and blood health and disease; transfusion medicine; and sleep disorders. New grants are no longer awarded.

Career Enhancement Award for Stem Cell Research (K18): To enable established investigators to acquire new research capabilities in the use of human or animal embryonic, adult, or cord blood stem cells. All candidates must have a sponsor, either within their own or at another institution, who is a well-qualified stem cell expert to serve as a mentor.

NHLBI Career Transition Award (K22): To support the postdoctoral research training of an outstanding individual in an NHLBI intramural laboratory for up to 3 years and subsequently, to support the individual's successful transition from postdoctoral research to an extramural environment as an independent researcher.

Mentored Patient-Oriented Research Career Development Award (K23): To provide support for career development to investigators who have made a commitment to focus their research endeavors on patient-oriented research.

Midcareer Investigator Award in Patient-Oriented Research (K24): To provide support for clinicians to allow them "protected time" to devote to patient-oriented research and to act as mentors for beginning clinical investigators.

Mentored Quantitative Research Career Development Award (K25): To provide support to investigators with quantitative science or engineering backgrounds who have made a commitment to focus their research on basic or clinical biomedicine, bioengineering, bioimaging, or behavioral sciences.

Clinical Research Curriculum Award (CRCA) (K30): To stimulate inclusion of high-quality, multidisciplinary didactic training in fundamental skills, methodology, theories, and conceptualization as part of the career development of clinical investigators.

Other Research Grants

Scientific Evaluation (R09): To provide funds to the chairman of an initial review group for operation of the review group.

Cooperative Clinical Research (R10) (U10): To support studies and evaluations of relevant clinical problems. These grants usually involve collaborative efforts among several institutions and principal investigators and are conducted under a formal protocol.

Conference Grants (R13): To support national and international scientific meetings, conferences, or workshops at which research is discussed.

Research Demonstration and Education Projects (R18): To provide support designed to develop, test, and evaluate health-related activities and to foster application of existing knowledge to the control of heart, lung, and blood diseases and sleep disorders.

Education Projects (R25): To provide support for the development and implementation of a program as it relates to a category in one or more of the areas of education, information, training, technical assistance, coordination, or evaluation.

Minority Biomedical Research Support Grants (S06) (S14): To strengthen the biomedical research and research training capability of minority institutions and to assist in increasing the involvement of minority faculty and students in biomedical research.

Biomedical Research Support Grants (S07): To strengthen, balance, and stabilize supported biomedical and behavioral research programs through flexible funds that permit institutions to respond quickly and effectively to emerging needs and opportunities; to enhance creativity and innovation, to support pilot studies, and to improve research resources.

Continuing Education Training Grant (T15): To assist professional schools and other public and nonprofit institutions to establish, expand, or improve programs of continuing professional education, especially for programs dealing with new scientific developments.

Scientific Review and Evaluation (U09): To support an initial Scientific Review Group responsible for the

assessment of scientific and technical merit of grant applications.

Conference (Cooperative Agreements) (U13): To support international, national, or regional meetings; conferences; and workshops where substantial programmatic involvement is planned to assist the recipient.

Resource-Related Research Projects (U24): To support research projects contributing to improvement of the capability of resources to serve biomedical research.

National Swine Research and Resource Center (U42): To support a National Swine Research and Resource Center that will serve as a resource for depositing, maintaining, preserving, and distributing swine models for studies of human diseases, as well as cryopreservation, storage, and reconstitution of embryos and germplasm.

Small Business Innovation Research Cooperative Agreements (U44): To provide support for phase II and fast-track projects that directly address identification and preclinical testing of new therapeutics.

Historical Black College and University Scientist Award (UH1): To strengthen and augment the human resources at historically black colleges and universities (HBCU) by recruiting an established research scientist into their biomedical or behavioral sciences department; to enhance the career of the recruited research scientist; and to strengthen other HBCU resources for the conduct of biomedical or behavioral research in areas related to cardiovascular, lung, and blood health and disease; transfusion medicine; and sleep disorders.

Individual National Research Service Awards (NRSA)

Predoctoral Individual NRSA (F31): To provide predoctoral individuals with supervised research training in areas related to heart, lung, and blood diseases; blood resources; and sleep disorders leading toward the research degree (e.g., Ph.D.).

Postdoctoral Individual NRSA (F32): To provide postdoctoral research training to individuals to broaden their scientific background and extend their potential for research in areas related to heart, lung, and blood diseases and blood resources.

NRSA for Senior Fellows (F33): To provide experienced scientists with an opportunity to make major changes in the direction of their research careers, to broaden their scientific background, to acquire new research capabilities, to enlarge their command of an allied research field, or to take time from regular professional responsibilities for the purpose of broadening their research capabilities.

Intramural NRSA Individual Postdoctoral Program Appointee (F35): To offer research health scientists, research clinicians, and others the opportunity to receive full-time research training in intramural laboratories of the NHLBI and of other Institutes of the NIH.

Institutional National Research Service Awards (NRSA)

Institutional NRSA (T32): To enable institutions to make awards to individuals selected by them for predoctoral and postdoctoral research training in areas related to heart, lung, and blood diseases; blood resources; and sleep disorders.

Minority Institutional Research Training Program (T32M): To support full-time research training for investigative careers at minority schools in areas of cardiovascular, pulmonary, and hematologic diseases and sleep disorders. Graduate students, postdoctoral students, or health professions students may be supported under this program.

MARC Undergraduate NRSA Institutional Grants (T34): To support institutional training grants for underrepresented minority undergraduates to obtain research training and improve their preparation for graduate training in the biomedical and behavioral sciences.

NRSA Short-Term Research Training (T35 and T35S): To provide individuals with research training during off-quarters or summer periods to encourage research careers or to encourage research in areas of national need. This program includes the Short-Term Training for Minority Students Program and short-term training for students in health professional schools.

MARC Visiting Professors for Minority Institutions (T36): To increase the number of well-trained minority scientists in biomedical disciplines and to strengthen the research and teaching capabilities of minority institutions.

Other Support

Research and Development Contracts (N01): To develop or apply new knowledge or test, screen, or evaluate a product, material, device, or component for use by the scientific community.

Small Business Innovation Research (N43): To support projects, limited in time and amount, to establish the technical merit and feasibility of R&D ideas that may ultimately lead to a commercial product(s) or service(s).

NIH Interagency Agreements (Y01): To provide a source of funds to another Federal agency to acquire specific products, services, or studies.

NIH Intra-Agency Agreements (Y02): To provide a source of funds to another NIH component to acquire specific products, services, or studies.

Minority Research Supplements Programs: To provide supplemental funds to active NHLBI grants to support the research of minority high school, undergraduate, and graduate students; postdoctoral trainees; and investigators.

List of Abbreviations and Acronyms

ACCORD	Action To Control Cardiovascular Risk in Diabetes
ACE	angiotensin-converting enzyme
ACRN	Asthma Clinical Research Network
ACTION	A CHF Trial Investigating Outcomes of Exercise
AIDS	acquired immunodeficiency syndrome
ALLHAT	Antihypertensive and Lipid-Lowering Treatment To Prevent Heart Attack Trial
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
BEA	Board of Extramural Advisors
BARI 2D	Bypass Angioplasty Revascularization Investigation in Type 2 Diabetics
CABG	coronary artery bypass graft
CAMP–CS /Phase 2	Childhood Asthma Management Program–Continuation Study/Phase 2
CARDIA	Coronary Artery Risk Development in Young Adults
CARE	Childhood Asthma Research and Education Network
CF	cystic fibrosis
CHD	coronary heart disease
CHS	Cardiovascular Health Study
CIHR	Canadian Institutes of Health Research
COBLT	Cord Blood Stem Cell Transplantation Study
COPD	chronic obstructive pulmonary disease
CORAL	Cardiovascular Outcomes in Renal Atherosclerotic Lesions
CSCC	Comprehensive Sickle Cell Centers
CVD	cardiovascular diseases
DASH	Dietary Approaches To Stop Hypertension
DBDR	Division of Blood Diseases and Resources
DEA	Division of Extramural Affairs
DECA	Division of Epidemiology and Clinical Applications
DHVD	Division of Heart and Vascular Diseases
DIR	Division of Intramural Research
DLD	Division of Lung Diseases
EDUC	Enhanced Dissemination and Utilization Center
FOCUS	Functional Outcomes in Cardiovascular Patients Undergoing Surgical Hip Fracture Repair
FORTE	Feasibility of Retinoid Treatment in Emphysema
FY	fiscal year
GEMS	Girls Health Enrichment Multisite Studies
GOCADAN	Genetics of Coronary Artery Disease in Alaska Natives
HAT	Home Automatic External Defibrillator Trial
HBCU	historically black colleges and universities

HDL	high-density lipoprotein
HEW	Department of Health, Education, and Welfare (now HHS)
HHS	Health and Human Services (formerly HEW)
HIV	human immunodeficiency virus
ICD	International Classification of Diseases
IMMEDIATE	Immediate Myocardial Metabolic Enhancement During Initial Assessment and Treatment in Emergency Care
IPF	idiopathic pulmonary fibrosis
JHS	Jackson Heart Study
LDL	low-density lipoprotein
MARC	Minority Access to Research Careers
MERIT	Method To Extend Research in Time
MESA	Multi-Ethnic Study of Atherosclerosis
MGS	Mammalian Genotyping Service
MI	myocardial infarction
MSH	Multicenter Study of Hydroxyurea
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
NETT	National Emphysema Treatment Trial
NHAAP	National Heart Attack Alert Program
NHANES	National Health and Nutrition Examination Survey
NHBPEP	National High Blood Pressure Education Program
NHI	National Heart Institute
NHIS	National Health Interview Survey
NHLBAC	National Heart, Lung, and Blood Advisory Council
NHLBI	National Heart, Lung, and Blood Institute (formerly NHI and NHLI)
NHLI	National Heart and Lung Institute
NIA	National Institute on Aging
NICHD	National Institute of Child Health and Human Development
NIAMS	National Institute of Arthritis and Musculoskeletal and Skin Diseases
NIDDK	National Institute of Diabetes and Digestive and Kidney Diseases
NIH	National Institutes of Health
NRSA	National Research Service Award
OAR	Office of AIDS Research
OD	Office of the Director
OEI	Obesity Education Initiative
OMHA	Office of Minority Health
OPEC	Office of Prevention, Education, and Control
OSA	obstructive sleep apnea
PA	Program Announcement
PAD	peripheral artery disease
PAHO	Pan American Health Organization
PEACE	Prevention of Events With Angiotensin Converting Enzyme Inhibitor Therapy
PEGT	Programs of Excellence in Gene Therapy
PGA	Programs for Genomic Applications
PHS	Public Health Service
PIOPED	Prospective Investigation of Pulmonary Embolism Diagnosis
POUNDS LOST	Preventing Overweight Using Novel Dietary Strategies
REDS	Retrovirus Epidemiology Donor Study
RFA	Request for Applications

RFP	Request for Proposals
RPG	research project grant
SANDS	Stop Atherosclerosis in Native Diabetics Study
SBIR	Small Business Innovation Research
SCD	sickle cell disease
SCCOR	Specialized Centers of Clinically Oriented Research
SCOR	Specialized Centers of Research
SDB	sleep disordered breathing
SEP	Special Emphasis Panel
SES	socioeconomic status
SIDS	sudden infant death syndrome
SRG	Scientific Research Group
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
WHI	Women's Health Initiative
WLM	Weight Loss Maintenance
WISE	Women's Ischemia Syndrome Evaluation
WHO	World Health Organization

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