Fact Book

Fiscal Year

2003

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

FACT BOOK

FISCAL YEAR

2003

FEBRUARY 2004

FOR ADMINISTRATIVE USE

NATIONAL INSTITUTES

OF HEALTH

NATIONAL HEART, LUNG,

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NATIONAL INSTITUTES OF HEALTH
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1. Directory of Personnel*

Office of the Director	Bldg.	Room	Phone	MSC†‡
Acting Director, **Barbara M. Alving, M.D.**	31	5A52	496–5166	2486
Acting Deputy Director, **Lawrence Friedman, M.D.**	31	5A47	496–1078	2490
Assistant to the Director, **Sheila Pohl**	31	5A52	496–6471	2486
Special Assistant to the Director (NHLBI AIDS Coordinator), **Elaine Sloand, M.D.**	31	4A35	496–3245	2490
Assistant Director for Ethics and Clinical Research, **Lawrence Friedman, M.D.**	31	5A03	496–9899	2490
Associate Director for Administrative Management, **Donald P. Christoferson**	31	5A46	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 International Programs, **Ruth J. Hegyeli, M.D.**	31	4A29	496–5375	2490
Office of Special Concerns Director, **Mishyelle I. Croom**	31	4A22	496–1763	2490
Office of Minority Health Affairs Director, **Helena Mishoe, Ph.D., M.P.H.**	RKL2§	6216	451–5081	7913
Office of Administrative Management				
Director/Executive Officer, **Donald P. Christoferson**	31	5A46	496–2411	2490
Administrative Officer, **Valery D. Gheen**	31	5A33	496–5931	2490
Management Policy and Administrative Services Branch				
Acting Chief, **Barry Rubinstein**	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	5A46	496–4653	2490
Extramural Administrative Management Branch				
Chief, **Loretta L. Barnes**	RKL2	7130	435–6373	7921
Intramural Administrative Management Branch				
Chief, **Carrol Hanson**	10	7N220	402–3646	1670
National Center on Sleep Disorders Research				
Director, **Carl E. Hunt, M.D.**	RKL1**	6022	435–0199	7993
Administrative Officer, **Stacey Long**	RKL2	7026	435–6373	7921
Women's Health Initiative				
Director, **Barbara M. Alving, M.D.**	31	5A52	496–5166	2486
Administrative Officer, **Charlotte M. Wiltshire**	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

* Current as of October 15, 2003. 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**
Program Operations Coordinator, **Nancy J. Poole, M.B.A.**	31	4A10	496–5437	2480
Administrative Officer, **Valery Gheen**	31	5A33	496–5931	2490
Health Communications and Information Science				
Senior Manager, **Terry C. Long**	31	4A10	496–0554	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
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 E. Tener**	31	5A33	496–5931	2490
Office of International Programs				
Director, **Ruth Hegyeli, M.D.**	31	4A29	496–5375	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				
Coordinator, **Jonelle Drugan, Ph.D., M.P.H.**	31	5A07	496–9899	2482
Information Resources and Technology Program				
Director, **John J. Filigenzi**	RKL2	8093	435–0119	7932
Administrative Officer, **Amy W. Sheetz**	RKL2	7026	435–6367	7921
Office of Technology Transfer and Development				
Director, **Lili M. Portilla**	RKL1	6018	402–5579	2490
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
Acting Deputy Director, **David J. Gordon, M.D.**	RKL2	9152	435–0466	7940
Special Assistant for Clinical Studies, **David J. Gordon, M.D.**	RKL2	9152	435–0466	7940
Senior Scientific Advisor, **Alice M. Mascette, M.D.**	RKL2	9154	435–0477	7940
Research Training and Special Programs Scientific Research Group				
Leader, **Beth Schucker, M.S.**	RKL2	9140	435–0535	7940
Administrative Officer, **Lisa A. Freeny**	RKL2	7026	435–6373	7921
Clinical and Molecular Medicine Program				
Director, **John Watson, Ph.D.**	RKL2	9166	435–0555	7940

Division of Heart and Vascular Diseases (continued)	**Bldg.**	**Room**	**Phone**	**MSC**
Cardiovascular Medicine Scientific Research Group				
Leader, **Patrice Desvigne-Nickens, M.D.**	RKL2	9178	435–0515	7940
Bioengineering and Genomic Applications Scientific Research Group				
Leader, **Susan Old, Ph.D.**	RKL2	9144	435–0513	7940
Heart Research Program				
Director, **John L. Fakunding, Ph.D.**	RKL2	9170	435–0494	7940
Arrhythmias, Ischemia, and Sudden Cardiac Death Scientific Research Group				
Acting Leader, **John L. Fakunding, Ph.D.**	RKL2	9170	435–0494	7940
Heart Development, Function, and Failure Scientific Research Group				
Leader, **Gail D. Pearson, M.D. Sc.D.**	RKL2	9200	435–0510	7940
Vascular Biology Research Program				
Director, **Sonia Skarlatos, Ph.D.**	RKL2	10198	435–0545	7956
Atherosclerosis Scientific Research Group				
Leader, **Momtaz Wassef, Ph.D.**	RKL2	10196	435–0558	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, **Patricial 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, **J. Sri Ram, Ph.D.**	RKL2	10206	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
Acute Lung Injury/Critical Care Scientific Research Group				
Leader, **Andrea Harabin, Ph.D.**	RKL2	10108	435–0222	7952
Developmental Biology and Pediatrics Scientific Research Group				
Leader, **Mary Anne Berberich, Ph.D.**	RKL2	10102	435–0222	7952

Division of Lung Diseases (continued)	**Bldg.**	**Room**	**Phone**	**MSC**
Immunology/Fibrosis Scientific Research Group				
Leader, **Herbert Reynolds, M.D.**	RKL2	10112	435–0222	7952
Lung Cell and Vascular Biology Scientific Research Group				
Acting Leader, **Dorothy B. Gail, Ph.D.**	RKL2	10100	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
Administrative Officer, **Kathryn Lightbody**	RKL2	7158	435–6373	7921
Blood Diseases Program				
Director, **Herman E. Branson, M.D.**	RKL2	10162	435–0050	7950
Hemoglobinopathies and Genetics Scientific Research Group				
Leader, **Greg Evans, Ph.D.**	RKL2	10152	435–0055	7950
Thrombosis and Hemostasis Scientific Research Group				
Leader, **Pankaj Ganguly, Ph.D.**	RKL2	10176	435–0070	7950
Research Training, **Ellen Werner, Ph.D.**	RKL2	10156	435–0061	7950
Blood Resources Program				
Director, **Jean Henslee-Downey, M.D.**	RKL2	10138	435–0065	7950
Transfusion Medicine and Cell Therapies Scientific Research Group				
Leader, **George J. Nemo, Ph.D.**	RKL2	10142	435–0075	7950
Research Training, **Traci Mondoro, Ph.D.**	RKL2	10035	435–0075	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				
Acting Director, **Denise Simons-Morton, M.D., Ph.D.**	RKL2	8138	435–0377	7936
Prevention Scientific Research Group				
Acting Leader, **Eva Obarzanek, Ph.D.**	RKL2	8136	435–0377	7936
Clinical Trials Scientific Research Group				
Leader, **Michael Domanski, M.D.**	RKL2	8146	435–0399	7936
Behavioral Medicine Scientific Research Group				
Leader, **Peter G. Kaufmann, Ph.D.**	RKL2	8118	435–0404	7936
Epidemiology and Biometry Program				
Director, **Teri Manolio, M.D., M.H.S.**	RKL2	8160	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, M.A.**	RKL2	8178	435–0444	7934

Division of Epidemiology and Clinical Applications (continued)	**Bldg.**	**Room**	**Phone**	**MSC**
Field Studies and Clinical Epidemiology				
Scientific Research Group				
Acting Leader, **(Vacant)**	RKL2	8150	435–0707	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	7924
Committee Management Officer, **Kathryn M. Valeda**	RKL2	7220	435–0255	7922
Administrative Officer, **Veronica M. Vanwagner**	RKL2	7112	435–6373	7921
Review Branch				
Chief, **Anne P. Clark, Ph.D.**	RKL2	7214	435–0270	7924
Referral Officer, **Roy White, Ph.D.**	RKL2	7192	435–0287	7924
Heart/Lung Scientific Review Group				
Leader, **Robert B. Moore, 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, **Valerie Prenger, Ph.D.**	RKL2	7194	435–0288	7924
Contracts Operations Branch				
Chief, **Robert Best**	RKL2	6100	435–0330	7902
Deputy Chief, **Douglas W. Frye**	RKL2	6224	435–0330	7902
Blood Diseases and Resources Contracts Section				
Chief, **Patricia E. Davis**	RKL2	6136	435–0355	7902
Heart, Lung, and Vascular Diseases Contracts Section				
Chief, **Pamela Lew**	RKL2	6106	435–0340	7902
Epidemiology and Clinical Applications Section				
Chief, **John C. Taylor**	RKL2	6126	435–0345	7902
Procurement Section				
Chief, **Debra C. Hawkins**	RKL2	6150	435–0366	7902
Grants Operations Branch				
Chief, **Suzanne A. White**	RKL2	7160	435–0144	7926
Deputy Chief, **Raymond Zimmerman**	RKL2	7174	435–0144	7926
Heart and Vascular Diseases Grants Management Section				
Chief, **David Reiter**	RKL2	7172	435–0177	7926
Lung Diseases Grants Management Section				
Chief, **Robert A. Pike**	RKL2	7154	435–0171	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, **Holly Atherton**	RKL2	7152	435–0177	7926

Division of Intramural Research	**Bldg.**	**Room**	**Phone**	**MSC**
Office of the Director				
Clinical Research Program				
Director, **Elizabeth G. Nabel, M.D.**	10	8C103	496–1518	1754
Clinical Director, **Richard O. Cannon III, M.D.**	10	7B15	496–9985	1650
Laboratory Research Program				
Director, **Robert S. Balaban, Ph.D.**	10	7N214	496–2116	1061
Intramural Administrative Management Branch				
Chief, **Carroll Hanson**	10	7N220	401–3646	1670
Clinical Research Program				
Bioinformatics Core				
Head, **Eric Billings, Ph.D.**	10	4A17	496–6520	1412
Flow Cytometry Core (FACS)				
Head, **Philip McCoy, Ph.D.**	10	4A07	451–8824	1412
Office of Clinical Affairs				
Chief, **Maria Stagnitto, M.S.N., R.N.**	10	8C104	496–2295	1755
Office of Education				
Chief, **Herbert Geller, Ph.D.**	10	8C213	435–6719	1755
Cardiothoracic Branch				
Chief, **(Vacant)**				
Cardiovascular Branch				
Chief, **Toren Finkel, M.D., Ph.D.**	10	7B14	402–4081	1650
Clinical Cardiology Section				
Chief, **Richard O. Cannon III, M.D.**	10	7B15	496–9985	1650
Experimental Atherosclerosis Section				
Chief, **Howard S. Kruth, M.D.**	10	5N113	496–4826	1422
Molecular Biology Section				
Chief, **Toren Finkel, M.D., Ph.D.**	10	7B14	402–4081	1650
Vascular Biology Section				
Chief, **Elizabeth Nabel, M.D.**	50	4523	435–7824	8016
Hematology Branch				
Chief, **Neal Young, M.D.**	10	7C103	496–5093	1652
Laboratory of Animal Medicine and Surgery				
Chief, **Robert Hoyt, D.V.M.**	14E	106B	496–9673	5570
Molecular Disease Branch				
Chief, **H. Bryan Brewer, M.D.**	10	7N115	496–5095	1666
Molecular Biology Section				
Chief, **Silvia Santamarina-Fojo, M.D., Ph.D.**	10	7N108	496–6050	1666
Peptide Chemistry Section				
Chief, **H. Bryan Brewer, M.D.**	10	7N115	496–5095	1666
Pulmonary Critical Care Medicine Branch				
Chief, **Joel Moss, M.D., Ph.D.**	10	6D03	496–1597	1590
Deputy Chief, **Martha Vaughan, M.D.**	10	5N307	496–4554	1434
Biochemical Physiology Section				
Chief, **Vincent Manganiello, M.D., Ph.D.**	10	5N307	496–1770	1434
Clinical Studies Section				
Chief, **Joel Moss, M.D., Ph.D.**	10	6D03	496–1597	1590
Metabolic Regulation Section				
Chief, **Martha Vaughan, M.D.**	10	5N307	496–4554	1434

Division of Intramural Research (continued)	**Bldg.**	**Room**	**Phone**	**MSC**
Molecular Mechanisms Section				
Chief, **Joel Moss, M.D., Ph.D.**	10	6D03	496–1597	1590
Pulmonary and Cardiac Assist Devices Section				
Chief, **Theodor Kolobow, M.D.**	10	5D07	496–2057	1590
Laboratory Research Program				
Interference RNA Core				
Head, **Yongsok Kim, Ph.D.**	10	8N228	496–3672	1762
Light Microscopy Core				
Head, **Christian Combs, Ph.D.**	10	6N309	496–3236	1412
Pathology Core				
Head, **Zu-Xi Yu, Ph.D.**	10	2N240	435–4011	1650
Proteomics Core				
Head, **Rong Fong Shen, Ph.D.**	10	6C208	594–1060	1597
Transgenics Core				
Head, **Chengyu Liu, Ph.D.**	50	3305	435–5034	8018
Biochemistry and Biophysics Center				
Chief, **Boon Chock, Ph.D.**	50	2125	496–2073	8012
Laboratory of Biochemistry				
Chief, **Boon Chock, Ph.D.**	50	2125	496–2073	8012
Laboratory of Biophysical Chemistry				
Chief, **James Ferretti, Ph.D.**	50	3517	496–3341	8013
Laboratory of Cell Signaling				
Chief, **Sue Goo Rhee, Ph.D.**	50	3523	594–7225	8015
Cell Biology and Physiology Center				
Chief, **Edward D. Korn, Ph.D.**	50	2523	496–1616	8017
Laboratory of Kidney and Electrolyte Metabolism				
Chief, **Mark A. Knepper, M.D., Ph.D.**	10	6N260	496–3187	1603
Laboratory of Cell Biology				
Chief, **Edward D. Korn, Ph.D.**	50	2523	496–1616	8017
Laboratory of Cardiac Energetics				
Chief, **Robert S. Balaban, Ph.D.**	10	B1D416	496–3658	1061
Laboratory of Molecular Cardiology				
Chief, **Robert S. Adelstein, M.D.**	10	8N202	496–1865	1762
Genetics and Development Biology Center				
Chief, **Cecilia Lo, Ph.D.**	50	4537	451–8041	8019
Laboratory of Biochemical Genetics				
Chief, **Marshall Nirenberg, Ph.D.**	10	7N315	496–5208	4036
Laboratory of Developmental Biology				
Chief, **Cecilia Lo, Ph.D.**	50	4537	451–8041	8019
Immunology Center				
Chief, **Warren Leonard, M.D.**	10	7N252	496–0098	1674
Laboratory of Molecular Immunology				
Chief, **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 20892–MSC†

Rockledge I Building

Full Name
NHLBI, NIH
One Rockledge Center, Room ____
6701 Rockledge Drive MSC* ____
Bethesda, MD 20892–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

In 1948, the National Heart Institute was established 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 diseases and the treatment and rehabilitation of patients suffering from such diseases and disorders.
- 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.

The programs of the NHLBI, as shown on page 10, are implemented through five extramural 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 the WHI, it

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, Availability of Blood and Blood Components
Stem Cell Biology
Myelodysplasia, Marrow Failure, 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
Prevention
Clinical Trials
Behavioral Medicine

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 Program
Cardiovascular
Hematology
Molecular Disease
Pulmonary/Critical Care Medicine
Animal Medicine and Surgery

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

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 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 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 HIV infection as it relates to the heart. SCORs support collaborative studies in ischemic heart disease, sudden cardiac death, heart failure, pediatric cardiovascular disease, and ischemic heart disease in blacks. 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 Ischemia, Arrhythmia, and Sudden Cardiac Death SRG 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.

The SRG also 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.

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, molecular

genetics of hypertension, and basic and clinical gene therapy. 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 lesion. 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 arterial disease, 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. Individual projects focus on heart failure, revascularization, the implantable artificial heart, and understanding minority and women's health. 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 prevention of 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 asthma, cystic fibrosis, the pathobiology of lung development, and the pathobiology of fibrotic lung disease; a SCCOR supports collaborative studies on 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, are also 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 impact of the environment on these mechanisms; 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 disease 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 (i.e., lung volume reduction surgery, long-term smoking cessation intervention, and retinoic acid therapy); 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.

Cystic Fibrosis SRG

The CF SRG oversees 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 is also an area of emphasis.

Sleep and Neurobiology SRG

The Sleep and Neurobiology SRG oversees sleep research on the neurobiology of breathing control during sleep and sleep apnea, health consequences of sleep disordered breathing, and treatments for sleep apnea.

Lung Biology and Disease Program

The Lung Biology and Disease Program supports research, education, and training programs in lung cell and vascular biology; lung growth and development and

pediatric lung disease; 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 research associated with the development of animal models for use in studying basic pathogenetic mechanisms involved in HIV-related lung disorders. Scientists seek to gain information that will lead to new treatment strategies. Additional areas of interest include cardiopulmonary complications of HIV infection in infants and children; pathobiology of TB and *Pneumocystis carinii* and basic cell biology of pulmonary manifestation of AIDS; lung-specific drug delivery systems for enhanced TB treatment; and behavioral interventions for control of TB.

Acute Lung Injury/Critical Care SRG

The Acute Lung Injury/Critical Care SRG oversees research on the etiology and pathophysiology of acute lung injury and the molecular and cellular pathogenesis of acute respiratory distress syndrome (ARDS). In addition, it maintains an ARDS network to evaluate therapeutic strategies, such as pulmonary artery catheterization, central venous catheterization, fluid management, and anti-inflammatory agents, including corticosteroids, in patients with the disorder and those at risk.

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 identifying genes and molecules that regulate the formation of lung alveoli 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, and evaluating the safety and efficacy of nitric oxide in preventing and treating chronic lung disease in newborn infants.

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; identifying genetic factors that influence sarcoidosis in blacks and genes that increase susceptibility to pulmonary fibrosis; and translating basic research findings into clinical applications for LAM.

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 two major programs:

- Blood Diseases Program
- Blood Resources Program.

Blood Diseases Program

The Blood Diseases Program supports research and training in nonmalignant disorders of red blood cells and disorders of hemostasis and thrombosis. It comprises the two SRGs 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—and which individually conduct basic and clinical research—and provide state-of-the-art patient care, educational activities for patients and health professionals, community outreach, and genetic counseling services.

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

Thrombosis and Hemostasis 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 the diagnosis, prevention, and treatment of thrombosis in heart attack, stroke, and peripheral vascular diseases. A major goal is to find additional platelet inhibitors, anticoagulants, and fibrinolytic agents that will improve specificity and reduce side effect when used in treatment of 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, are also being studied. Other emerging areas being supported are gene transfer, clinical proteomics, inflammation and thrombosis, coagulation activation, autoimmune disease, and thrombotic complications of obesity, diabetes, and cancer.

Blood Resources Program

Transfusion Medicine Cell Therapies SRG

The Blood Resources Program, through its Transfusion Medicine Cell Therapies SRG, plans and directs research and training in transfusion medicine, stem cell biology and disease, and clinical cellular medicine. 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 potential cell-based therapies. 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 are areas of major focus.

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 plans, directs, and evaluates research on the causes, prevention, diagnosis, and treatment of cardiovascular, lung, and blood disease. It supports epidemiologic studies, clinical trials, demonstration and education research, disease prevention and health promotion research, and basic and applied research in

behavioral medicine. In addition, it provides training and career development in cardiovascular, lung, and blood diseases and sleep disorder research for individuals at all stages of their professional training.

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 in prevention of heart and vascular, pulmonary, and blood diseases through clinical trials, community interventions, and research on health promotion-disease prevention, health education, nutrition, and behavioral medicine. It comprises the three SRGs described below.

Prevention SRG

The Prevention SRG oversees research to evaluate the effectiveness of preventive interventions to reduce cardiovascular risk factors. Special population groups (e.g., minorities and children in social units, such as schools and workplaces) are frequently studied. Ongoing programs include studies of prevention and treatment of hypertension; hyperlipidemia, obesity, and other risk factors in children, adolescents, and adults; interventions to improve delivery of care using evidence-based guidelines; efficacy of various treatments to prevent major cardiovascular events in adults with diabetes; effects of exercise training on mortality in heart failure patients; and community-wide prevention programs.

Clinical Trials SRG

The Clinical Trials SRG oversees a program that evaluates the effectiveness of various medical procedures and therapeutic agents in patients with coronary heart disease (CHD), hypertension, and heart failure. Examples include assessing the long-term safety and efficacy of an angiotensin converting enzyme (ACE) inhibitor to prevent major CVD events in patients with documented normal ventricular function, testing the ability of selected antihypertensive and lipid-lowering drugs to prevent heart attack among individuals at high risk for hypertension and CHD, and comparing use of an implantable cardiac defibrillator to conventional pharmacologic therapy to improve survival among heart failure patients.

Behavioral Medicine SRG

The Behavioral Medicine SRG oversees research related to biopsychologic and sociocultural factors involved in heart, lung, blood diseases and sleep disorders and promotes collaborations between biomedical and behavioral scientists. Areas of emphasis include central nervous system regulation of the cardiovascular system; identification of psychosocial factors (e.g., social support, depression, hostility) affecting disease etiology, treatment, and rehabilitation; and effects of psychosocial and behavioral interventions on risk factors (e.g., smoking, adverse diet, physical inactivity), disease outcomes, and quality of life.

Epidemiology and Biometry Program

The Epidemiology and Biometry Program supports and conducts research of heart and vascular, lung, and blood diseases using field studies and clinical epidemiology, genetic epidemiology, and analytical resources. It comprises the three SRGs described below.

Analytical Resources SRG

The Analytical Resources SRG oversees programs that document the national and international scope of heart, lung, and blood diseases, their risk factors, and their trends over time. It provides methodological, statistical, and computer support to research needs within the Division and manages distribution of study data sets to outside researchers. In addition, the SRG provides project officer leadership to epidemiologic studies supported by the NHLBI, specifically the Framingham Heart Study, the National Longitudinal Mortality Study (NLMS), and the National Health and Nutrition Examination Survey (NHANES).

Genetic Epidemiology SRG

The Genetic Epidemiology SRG oversees several long-term studies of twins, multiple generations, Native Americans, and blacks designed to estimate heritability and identify genes that contribute to the development of CVD risk factors and CVD. It also monitors long-term studies that examine candidate genes for CVD from unrelated individuals. Other targeted areas include identifying and characterizing genes related to CHD and atherosclerosis to determine how they interact with environmental factors in disease development; examining associations between CHD risk factors and development of atherosclerosis, heart failure, cardiomyopathy, and stroke in adults and the elderly; and identifying genetic factors influencing coronary and aortic calcifica-

tion and individual variability in the inflammatory response.

Field Studies and Clinical Epidemiology SRG

The Field Studies and Clinical Epidemiology SRG oversees research on development and progression of CVD risk factors in young adults; development and progression of atherosclerosis measured noninvasively in middle-aged or older adults; and development and progression of overt cardiovascular and pulmonary disease in older adults. It also oversees surveillance of CHD incidence and mortality in four U.S. communities. Areas of interest include associations of genetic and environmental influences, traditional and novel risk factors, and subclinical disease with incidence, morbidity, and mortality from CHD, stroke, heart failure, and peripheral vascular disease; and relationships of comorbidities such as insulin resistance, diabetes, and renal insufficiency with CVD and its risk factors. Research strategies apply family, longitudinal, demographic, and vital statistics to study their natural history, etiology, and epidemiology. Also important is building research capabilities in minority institutions and addressing the critical shortage of minority investigators in epidemiology and prevention.

Office of Biostatistics Research

The Office of Biostatistics Research is responsible for providing statistical expertise to the Institute on planning, designing, implementing, and analyzing NHLBI-sponsored studies. When called upon, it develops new statistical solutions to problems for which techniques are not yet available. Designing efficient trials and monitoring data collection are important functions of the Office. Research includes new methods for permitting extension or early suspension of ongoing randomized clinical trials, methods for analyzing complex survival data, trials with multiple endpoints, and trials involving multiple treatments.

National Center on Sleep Disorders Research

The NCSDR plans, directs, and supports a program of basic, clinical, and applied research, health education, research training, and prevention-related 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 encourages their cooperation to plan and implement relevant interdisciplinary 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 elucidating the etiology and pathogenesis of sleep disorders, particularly sleep apnea; determining the role of sleep apnea in CVD and cerebrovascular disease; examining sleep and sleep disorders in children; and identifying new animal models of sleep disorders.

In 2003, the NCSDR released the revised National Sleep Disorders Research Plan, which can be found on the NCSDR Web site. The Plan summarizes advances in knowledge since the first plan was released in 1996, identifies gaps in our knowledge base, and recommends research priorities. Recommendations include training of sleep research scientists, education of health care professionals, and community-based public education programs.

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 Sleep Academic Award Program is designed to develop comprehensive curricula on sleep and sleep disorders for enhanced learning by medical students, residents, and practicing physicians, and other health care professionals. In collaboration with the American Academy for Sleep Medicine, the Sleep Academic Award Program developed a Web page that includes more than 50 curricular resources for basic science and clinical educators in health sciences.

The NCSDR continues to work 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. A video program, “Sleep Apnea: Is Your Patient at Risk,” was developed for clini-

cians and hospital staff as part of a continuing medical education series.

Reaching children and adolescents with messages about sleep and sleep disorders is a major priority. Educational activities for 2003 included disseminating a new high school supplemental curriculum on the biology of sleep, preparing a manuscript on the etiology, consequences, recognition, and treatment of sleepiness in adolescents by the NCSDR Working Group on Sleepiness in Adolescents/Young Adults, and making additional refinements in the Garfield-Star Sleeper Web site.

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. Three clinical trials enrolled a total of 68,135 women for 8.5 years with the goals of assessing the preventive use of hormone therapy (HT), diet modification, and calcium and vitamin D supplements. The HT portion of the trial was designed to investigate risks and benefits of combined estrogen and progestin on CHD, breast cancer, and osteoporosis risk in women with a uterus, and estrogen alone in women without a uterus. The dietary modification portion was designed to examine the ability of a diet low in fat but high in fruits, vegetables, and grains to prevent breast and colorectal cancers and heart disease, and the calcium and vitamin D supplements portion was designed to determine the ability of the two nutrients to prevent fractures and reduce 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 involves no specific intervention, but is tracking their medical history and health habits for 8.5 years. The study is looking for predictors and biological markers—including genetic markers—for disease.

A key component of the observation study is the introduction of new forms of HT—in particular those that are from natural sources and those that are designer estrogens. Investigators will compare the data from the clinical trial with the data from the observational study to determine the benefits and risks of various forms of estrogen.

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

The community prevention study component focused on community-based strategies to enhance adoption of healthful behaviors, especially among women of different races, ethnic groups, and socioeconomic strata. Its goal was to develop carefully evaluated model programs that can be implemented in a wide range of communities throughout the United States. Areas of emphasis included reduction of CVD among black women; peer support among black women; environmental factors and physical activity in women; osteoporosis prevention, education, and outreach; diabetes care in minority women; methods to enhance physical activity in women; and women's attitudes regarding surgical menopause and HT.

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 of the WHI, 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 the combined therapy compared to women taking placebo pills. They also found decreases in hip fractures and colon cancer in the treatment group compared to 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.

A separate study of estrogen alone among women who have had a hysterectomy is continuing, so the balance of

risks and benefits for that treatment strategy is still unknown.

In 2003, a memory substudy of the WHI found that older women taking combination HT 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.

In a separate analysis of all the participants in the trial of combination HT, researchers found that, although HT did relieve hot flashes and night sweats that participants experienced upon entry to the study, it did not have a clinically meaningful effect on health-related quality of life. Specifically, the findings showed individuals on combination HT:

- Had a 5-year elevated risk of CHD, with the highest risk in the first year of treatment; none of the subgroups experienced a reduction in CHD risk.
- Had an increased risk of breast cancer and a delay in its diagnosis. An increase in breast density in treated patients hindered interpretation of their mammograms.
- Had an increased risk of ischemic stroke, which was present in all subgroups. The excess risk for stroke appeared in the second year after randomization and persisted thereafter.

Division of Intramural Research

The NHLBI DIR conducts clinical research on normal and pathophysiologic functioning of the heart, lung, blood, and vascular systems, and basic research on normal and abnormal cellular behavior at the molecular level. In FY 2003, the Laboratory Research Program was modified to consolidate some of the research effort. Four Centers—the Genetics and Development Biology Center, the Cell Biology and Physiology Center, the Biochemistry and Biophysics Center, and the Immunology Center—were established, and all Sections were abolished. The new organizational structure of the Program can be found under Division of Intramural Research in Chapter 1, Directory of Personnel.

Research foci of the DIR range from structural organic chemistry to cardiology. Major areas of interest include mechanisms of gene regulation, gene transfer, and gene therapy; molecular basis of lipoprotein dysfunctions and atherogenic process; molecular basis of vascular diseases; molecular basis of diseases of alveolar structures of the lung and design of new therapeutic modalities; cellular and molecular events underlying ischemic heart disease and myocardial hypertrophy; biochemical events associated with aging and certain pathologic processes; molecular, structural, and developmental aspects of muscle and nonmuscle contractile systems; biochemistry and physiology of calcium channels; molecular and cellular processes for conversion of metabolic energy into useful work; molecular basis of transmembrane signaling and signal transduction pathways; pathophysiology of renal function at cellular and molecular levels; biochemistry of trace nutrients; enzyme kinetics, metabolic regulation, and protein chemistry; and cellular and molecular basis of toxicity induced by drugs and other foreign compounds.

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. To accomplish its mission, OPEC maintains health education programs and develops initiatives that address high blood pressure, high blood cholesterol, asthma, early warning signs of heart attack, obesity, sleep disorders, and women's heart health. Two approaches are used: one focuses on individuals at high risk; the other focuses on the general public. Special attention is given to minority populations that are disproportionately affected by disorders within the Institute's mandate.

OPEC is also responsible for coordinating the Institute's nutrition program. The NHLBI Nutrition Coordinator serves as a major source of nutrition policy and nutrition science knowledge and advises the NHLBI Director on nutrition program policies and priorities.

The four largest education programs have coordinating committees consisting of national medical, public health, and voluntary organizations and other Federal agencies. The committees 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 dis-

ability related to high blood pressure. It has employed a comprehensive strategy to mobilize, educate, and coordinate groups interested in hypertension prevention and control.

In 2003, the NHLBI released the *Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure* (JNC 7), which is available on the NHLBI Web site, along with teaching slides, patient information, and other supporting materials. The report outlines new clinical practice guidelines for the prevention, detection, and treatment of high blood pressure and features new blood pressure categories, including a prehypertension level that covers approximately 22 percent of American adults. The prehypertension level was introduced because researchers found that cardiovascular complication can begin below 139/89 mm Hg—levels previously considered normal or borderline.

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 deaths from CHD. Its goal is to reduce the prevalence of elevated blood cholesterol in the United States, and thereby contribute to reducing CHD morbidity and mortality.

The NCEP has employed a comprehensive strategy to attract individuals and groups interested in lowering blood cholesterol levels. Along with its Coordinating Committee, it convenes expert panels to develop guidelines for health professionals and then distributes their recommendations to physicians, other health care professionals, and laboratories. The reports of the expert panels serve as a basis for a wide variety of NCEP educational activities and materials.

The latest cholesterol treatment guidelines, "Adult Treatment Panel III (ATP III)," were published in *Circulation* in December 2002. They focus attention on the need to lower low-density lipoprotein (LDL) cholesterol in high-risk individuals—those with diabetes or multiple risk factors—to prevent the development of CHD. A new patient booklet on therapeutic lifestyle changes based on the ATP III recommendations is being prepared.

The ATP III goes beyond LDL lowering to highlight the metabolic syndrome as a significant contributor for CHD and identifies it as a secondary target of therapy, after the LDL goal is achieved. The metabolic syndrome, a cluster of lipid and nonlipid risk factors of metabolic origin, is a significant medical and public heath issue, affecting about a quarter of American adults. It is associated with insulin resistance, and its underlying causes are overweight/obesity and physical inactivity. Lifestyle change, especially weight control and physical activity, is the primary treatment. Additional guidance is being developed for professionals and the public to help them address the metabolic syndrome.

In 2003, the NCEP worked with the Food and Drug Administration (FDA) to ensure scientific soundness of the rationale for a new rule requiring food labels to display trans-fat content. It is also collaborating with the FDA to develop consumer education material on how to interpret food label information on saturated fat, trans fat, and cholesterol.

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 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 2003, the NAEPP convened a working group to review the scientific literature on managing asthma during pregnancy and determine whether the recommendations of the 1993 NAEPP report on asthma and pregnancy should be updated. The group is focusing on the safety and efficacy of pharmacologic treatment.

Other recent activities include partnering with the American Diabetes Association, the American School Health Association, the Epilepsy Foundation, the Food Allergy and Anaphylaxis Network, and the National School Boards Association to develop a guidance sheet on multiple chronic illnesses (e.g., asthma, allergies, diabetes, and epilepsy) for schools and families; working with the Centers for Disease Control and Prevention

(CDC) to produce an abbreviated version of the asthma guidelines directed to third-party payers, purchasers, and planners of health care; and continuing grassroots activities with asthma coalitions in high-risk communities to reduce the burden of asthma among minorities and the poor.

The National Heart Attack Alert Program (NHAAP) was initiated in June 1991 to reduce morbidity and mortality from MI, including out-of-hospital cardiac arrest, through education of health providers (e.g., physicians, nurses, and emergency medical services personnel), 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.

Since its inception, the Program has taught health care providers in emergency departments and emergency medical services systems about the importance of reducing the interval between the onset of heart attack symptoms and treatment. Available treatments, if administered soon after heart attack symptoms start, can save lives and minimize heart muscle damage in heart attack survivors.

In 2003, the NHAAP continued to promote the "Act in Time to Heart Attack Signs" campaign through national and local partnerships. The campaign, launched in 2001, involves a call to action that urges physicians to educate their patients about heart attack risk, warning signs, and survival. Educational materials for the public and 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 and high blood cholesterol and is related to sleep apnea.

The OEI employs a comprehensive strategy to mobilize, educate, and coordinate groups interested in preventing and treating overweight and obesity. One of the major OEI prevention activities is "Hearts N' Parks," a national community-based program located in 50 at-risk communities in 11 Magnet Center States. The program, conducted in collaboration with the National Recreation and Park Association (NRPA), is designed to reduce the growing trend of obesity and risk of CHD in the United States by encouraging Americans of all ages to seek a healthy weight, follow a heart-healthy eating plan, and engage in regular physical activity while taking part in local park and recreation department programs.

The Hearts N' Parks—Phase II Report of 2002 Magnet Center Performance Data, released in 2003, includes information on 68 programs from 36 Hearts N' Parks sites and can be found on the NRPA Web site. The approximately 1,200 individuals who participated showed significant improvements in almost all indicators of heart-healthy eating knowledge, attitude, behavior, and physical activity.

OEI educational activities include working with the North American Association for the Study of Obesity and CineMed to develop and market two online professional modules on assessing and managing overweight and obesity in adults; completing the "Weight Education Kit" for physicians to assist them in establishing an effective weight management program; and developing a new Web-based interactive quiz, "Portion Distortion: Do you know how portion sizes have changed in 20 years?" Professional and public education information can be found on the OEI's "Aim for a Healthy Weight" Web page.

The NHLBI Nutrition Coordinator represents the Institute and serves as the contact person to other relevant components of the NIH, the Department of Health and Human Services (DHHS), and the Federal Government on nutrition research and policy. Major activities in 2003 include participating in the development of the 2005 revision of the Dietary Guidelines for Americans, reviewing the *World Health Organization/Food and Agriculture Organization Expert Report on Diet, Physical Activity and Chronic Disease*, and serving on the NIH Nutrition Coordinating Committee.

The Institute convened a 2-day Think Tank on Enhancing NHLBI Obesity Research and invited experts in the field to evaluate the current state of knowledge and recommend promising research priorities in obesity research. The Institute, along with representatives from the other 23 Institutes/Centers, is also participating on the NIH Task Force on Obesity, chaired by the Acting Director of NHLBI and the Director of NIDDK. Their role is to develop a trans-NIH research plan on obesity.

The NHLBI Women's Heart Health Education Initiative was begun in 2001 to expand, intensify, and coordinate research and educational programs related to CVD in women. In 2002, it launched the Heart Truth campaign directed at women, 40 to 60 years old, and health professionals to increase heart disease awareness, improve detection and treatment of risk factors by health professionals, and motivate national and community organizations to become involved in heart-health education for women. A creative element of the campaign was The Red Dress Project.

The Institute introduced the Red Dress as a positive image to convey heart disease awareness messages to women. The Project received considerable media attention, and DHHS Secretary Tommy Thompson declared the third Friday of February Women's Heart Day, when he presented the Red Dress Project at DHHS headquarters.

As a key part of its response to the Healthy People 2010 Objectives for the Nation, the NHLBI initiated a new funding mechanism 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 increase quality and years of health in underserved populations. In 2001, the Institute awarded EDUCs to high-risk health service areas in Arkansas, North Carolina, Texas, Virginia, and West Virginia to conduct educational projects targeting populations at greatest risk for heart disease and stroke. Multiple strategies to prevent and control CVD risk factors and to promote heart-healthy behavior have been designed specifically for different age groups, ranging from childhood to adulthood. Six additional EDUCs were awarded to areas in Maryland, Ohio (2), Colorado, Nebraska, and North Carolina in 2002. As a result, 12 EDUCs are now serving more than 30 communities in 10 States.

A major goal of the Institute is to eliminate health disparities and to increase the quality and years of healthy life of all Americans. Through partnerships with groups that have special ties and access to targeted populations, the NHLBI is extending its outreach and educational activities to underserved communities. As one of its activities focusing on blacks, the Institute is collaborating with the Baltimore City Cardiovascular Health Partnership to train public housing residents as community health workers to spread heart-health information throughout the public housing community. Before developing materials tailored to the needs of the community, the Institute held a workshop that included health, social, and community service representatives and public housing staff, resident leaders, and residents to glean strategies for heart-health education and promotion in public housing. It also conducted small group discussions with residents to understand their unique educational needs and product preferences.

The Institute's Salud para su Corazón (Health for Your Heart) Initiative, a community-based heart-health program for Latinos, is expanding 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), applying the values and culture of the communities and mobilizing partners, teach people how to reduce their risk of developing CVD. As advocates for change, they have increased the number of Latinos in their communities who are engaging in heart-healthy behaviors.

The NHLBI Indian Health Service Partnership to Strengthen the Heartbeat of American Indian (AI) and Alaskan Native (AN) Communities is a collaborative effort to educate three tribal communities (Ponca Tribe of Oklahoma, Bristol Bay Area in Western Alaska, and Laguna Pueblo in New Mexico) about cardiovascular health and to reduce their risk for CVD. In 2002, tribal heart-health teams received training on cardiovascular health, including physical activity, obesity, smoking prevention, nutrition, high blood cholesterol, and high blood pressure, and on theories of team building, evaluation, and community interaction and intervention. They also participated in a workshop to evaluate a culturally appropriate community training manual for AI/AN audiences that was recently drafted. Their comments were adopted into the final manual that will be used in a regional training session to expand the heart-health message to other AI/AN communities.

Asian Americans and Pacific Islanders are a heterogeneous group with varying levels of CVD risk factors, acculturation, and socioeconomic status and with different native cultures, languages, immigration history, and community norms related to health and well being. The NHLBI, along with the Asian and Pacific Islander American Health Forum, conducted health assessments among Americans of Philippine, Vietnamese, and Cambodian heritage to obtain information on their knowledge of and attitudes toward CVD and its risk factors, disease pre-

vention, and health behavior and summarized them in two reports, one for those of Philippine background and one for those of Vietnamese background. The assessments are being used to guide the development of culturally and language appropriate educational materials.

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.

Australia, China, Germany, India, Italy, Japan, Korea, Poland, Russia, and Vietnam are among the countries that maintain a collaborative working relationship with the NHLBI. The partnerships extend the benefits of the Institute's prevention and treatment programs to other countries.

At the regional level, the NHLBI is addressing the pandemic of CVD in North, Central, and South America and the Caribbean through support of the Pan American Hypertension Initiative (PAHI), a public/private partnership initiated by the NHLBI and the Pan American Health Organization (PAHO) in collaboration with seven international scientific organizations—the World Heart Federation, the Inter-American Heart Foundation, the Inter-American Society of Cardiology, the Inter-American Society of Hypertension, the Pan American Network of CARMEN Programs, the Latin American Society of Nephrology and Hypertension, and the World Hypertension League. The initiative seeks to reduce morbidity and mortality from CVD by controlling hypertension, a major risk factor for the disease, in an estimated 40 million people who already have the condition and by preventing it in millions more at risk because of their unhealthy lifestyles. In 2003, the Institute and PAHO began a 5-year collaboration in CVD prevention and control based on PAHI and the Institute's Salud para su Corazón Initiative.

The NHLBI, in collaboration with the Giovanni Lorenzini Medical Science Foundation, the NIH Office of Research on Women's Health, and the NIH, published an evidence-based report, *International Position Paper on Women's Health and Menopause: A Comprehensive Approach*, that covers women's health and disease, specifically, menopause and aging, CVD, cancer, osteoporosis, Alzheimer's disease, and the role of hormone replacement therapy. The document will be translated into 11 languages including Japanese and Russian.

In 2003, the Institute and the Canadian Institute of Circulatory and Respiratory Health, Canadian Institute of Health Research, agreed to issue joint initiatives in:

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

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

3. Important Events

June 16, 1948. President Harry S Truman signs the National Heart Act, creating the National Heart Institute (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 cardiovascular diseases (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 Lyndon B. Johnson on March 7, 1964, submits its report to "recommend steps that can be taken to reduce the burden and incidence of these diseases."

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

July 1972. The NHLI launches its National High Blood Pressure Education Program (NHBPEP), a program of patient and professional education that has as its goal to reduce death and disability related to high blood pressure.

July 14, 1972. Secretary Richardson approves reorganization of the NHLI, with the Institute elevated to Bureau status within the NIH and comprising seven division-level components: Office of the Director, Division of Heart and Vascular Diseases, Division of Lung Dis-

eases, Division of Blood Diseases and Resources, Division of Intramural Research, Division of Technological Applications, and Division of Extramural Affairs.

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. Robert I. Levy.

September 1982. The results of the Multiple Risk Factor Intervention Trial are released. They support mea-

sures 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 Division of Epidemiology and Clinical Applications 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. In NHLBI-NIH Clinical Center interagency agreement for studies on the transmission of human immunodeficiency virus (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 (SEP) 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.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

June 11, 1991. The NHLBI initiates a National Heart Attack Alert Program (NHAAP) to reduce premature morbidity and mortality from acute MI 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 ACE inhibitor enalapril causes a significant reduction in mortality and hospitalization for CHF 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 National Center on Sleep Disorders Research 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 are released through a clinical alert. They demonstrate that hydroxyurea reduced the number of painful episodes by 50 percent in severely affected adults with sickle cell disease. 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 high-density lipoprotein cholesterol, low-density lipoprotein cholesterol, and cigarette smoking affect the progression of atherosclerosis equally in women and men, regardless of race.

February 24, 1997. The National Asthma Education and Prevention Program 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 Women's Health Initiative, 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 National High Blood Pressure Education Program 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 bio-behavioral 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.

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 a wearable 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 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 DHHS Office of Disease Prevention and Health Promotion, the Centers for Disease Control and Prevention, the American Heart Association, the Centers for Medicare and 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 African Americans.

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

January 23, 2003. An NHLBI-supported study demonstrates that magnetic resonance imaging (MRI) 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, 2003. 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 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 National Emphysema Treatment Trial (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.

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 2001, cardiovascular, lung, and blood diseases accounted for 1,161,000 deaths and 48 percent of all deaths in the United States (p. 37). The projected economic cost in 2004 for these diseases is expected to be $512 billion, 23 percent of the total economic costs of illness, injuries, and death (p. 53). Of all diseases, heart disease is the leading cause of death, cerebrovascular disease is third (behind cancer), and COPD (including asthma) ranks fourth (p. 40). Cardiovascular and lung diseases account for three of the four leading causes of death (p. 40) and four of the six leading causes of infant death (p. 46). Hypertension, heart disease, asthma, and chronic bronchitis are especially prevalent and account for substantial morbidity in Americans (p. 49). Increases in prevalence have been greatest for asthma and CHF.

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 30 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 2001, CVD caused 931,000 deaths—38 percent of all deaths (p. 37).
- Heart disease is the leading cause of death; the main form, CHD, caused 502,000 deaths in 2001 (pp. 38, 40).
- The annual number of deaths from CVD increased substantially between 1900 and 1970 and remains high (p. 39).
- The death rate (not age-adjusted) for CVD increased from 1920 until it peaked in 1968. Since then, the trend has been downward. In 2001, the rate was similar to the rate in 1930 (p. 39).
- Cerebrovascular disease, the third leading cause of death, accounted for 164,000 deaths in 2001 (pp. 38, 40).
- Heart disease is second only to all cancers combined in years of potential life lost (p. 40).
- Among minority groups, heart disease ranks first, and stroke ranks fifth or higher as the leading causes of death (p. 40).
- The rapid increase in deaths due to CHF between 1968 and 2001 is a major exception to the mortality decline in CVD (p. 41).
- Between 1985 and 2000, death rates for heart disease and stroke declined for men and women in all racial/ethnic groups (p. 42).
- Because of the rapid decline in mortality from CHD since the peak in 1968, there were 861,000 fewer deaths from CHD in 2001 than would have occurred if there had been no decline (p. 43).
- Substantial improvements have been made in the treatment of CVD. Since 1975, case-fatality rates from hospitalized AMI, stroke, cardiac dysrhythmia, and CHF patients declined appreciably (p. 43).
- 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. 44).

- Between 1991 and 2001, the percent decline in death rates for CHD was greatest among white males and least among black females (p. 45).
- In 2001, an estimated 64.4 million persons in the United States had some form of CVD; 50 million had hypertension, and 13 million had CHD (p. 49).
- Since the 1960s, there has been a substantial reduction in the prevalence of CVD risk factors: hypertension, smoking, and high cholesterol, but not overweight (p. 50).
- A 1988–94 national survey showed that many more people with hypertension (systolic BP > 160 mmHg or diastolic BP > 95 mmHg or on antihypertensive medication) were aware of their condition and had it treated and controlled compared with individuals with hypertenson in previous years (p. 51).
- A 1999–2000 national survey showed only 31 percent of hypertensive patients (systolic BP > 140 mmHg or diastolic BP > 90 mmHg or on antihypertensive medication) had their condition under control (p. 51).
- Hospitalization rates for CHF increased between 1971 and 2001 (p. 52).
- The estimated economic cost of CVD for 2004 is approximately $369 billion:
  - $227 billion in direct health expenditures
  - $34 billion in indirect cost of morbidity
  - $108 billion in indirect cost of mortality (p. 53).

Lung Diseases

- Lung diseases, excluding lung cancer, caused an estimated 234,000 deaths in 2001 (p. 37).
- COPD caused 119,000 deaths in 2001 and is the fourth leading cause of death (pp. 38, 40).
- Between 1991 and 2001, death rates for COPD increased substantially in women and decreased slightly in men; mortality for asthma increased in black women but decreased in white women and in men (p. 45).
- Between 1980 and 2001, infant death rates for various lung diseases declined markedly (p. 45).
- Of the six leading causes of infant mortality, four are lung diseases or have a lung disease component (p. 46). Between 1991 and 2001, changes in mortality for the causes were:
  - Congenital anomalies (-27 percent)
  - Disorders of short gestation (+9 percent)
  - Sudden infant death syndrome (-57 percent)
  - Respiratory distress syndrome (-60 percent).
- Lung diseases accounted for 22 percent of all deaths under 1 year of age in 2001 (p. 46).
- The COPD death rate for women in the United States is increasing significantly compared with the rates in several other countries (p. 47).
- Between 1985 and 2000, death rates for COPD increased for women in all racial/ethnic groups. Among men, they increased in blacks and American Indians, but declined in whites and Hispanics (p. 48).
- Sleep disorders are increasingly being recognized as an important health problem. The number of physician office visits for sleep apnea, insomnia, restless legs syndrome, narcolepsy, and other major sleep disorders increased from 710,000 in 1989 to 5,288,000 in 2001 (p. 48).
- Asthma is a common chronic condition, particularly in children (pp. 49, 50, 52).
- The economic cost of lung diseases is expected to be $132 billion in 2004—$76 billion in direct health expenditures and $56 billion in indirect cost of morbidity and mortality (p. 53).

Blood Diseases

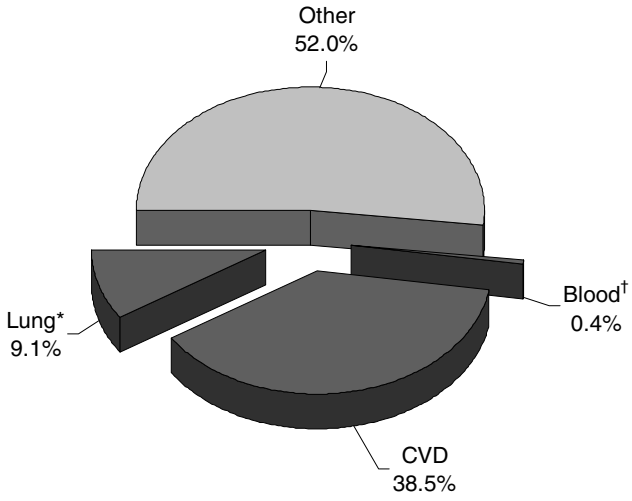
- An estimated 256,000 deaths, 10 percent of all deaths, were attributed to blood diseases in 2001 (p. 37). These include the following:
  - 246,000 due to blood-clotting disorders
  - 10,000 to diseases of the red blood cell and bleeding disorders (p. 38).
- A large proportion of deaths from acute MI and cerebrovascular disease involve blood-clotting problems (p. 38).
- In 2004, blood-clotting disorders are expected to cost the Nation's economy $86 billion, and other blood diseases will cost $12 billion (p. 53).
- The mean age at death for persons with sickle cell anemia increased from about 28 years in 1979 to 37.7 years in 2001 (not shown).

Deaths From All Causes and Deaths From Cardiovascular, Lung, and Blood Diseases, U.S., 1981 and 2001

Cause of Death	1981 Number of Deaths	1981 Percent of Total	2001 Number of Deaths	2001 Percent of Total
All Causes	1,978,000	100	2,416,000	100
All Cardiovascular, Lung, and Blood Diseases	1,130,000	57	1,161,000	48
Cardiovascular Diseases	984,000	50	931,000	38
Blood	335,000*	17	256,000†	10
Lung	151,000‡	8	234,000‡	10
All Other Causes	848,000	43	1,255,000	52

* Includes 329,000 CVD deaths involving blood clotting disease.
† Includes 246,000 CVD deaths involving blood-clotting disease.
‡ Includes 10,000 CVD deaths due to pulmonary heart disease in 1981 and 14,000 in 2001.
Source: Vital Statistics of the United States, National Center for Health Statistics (NCHS).

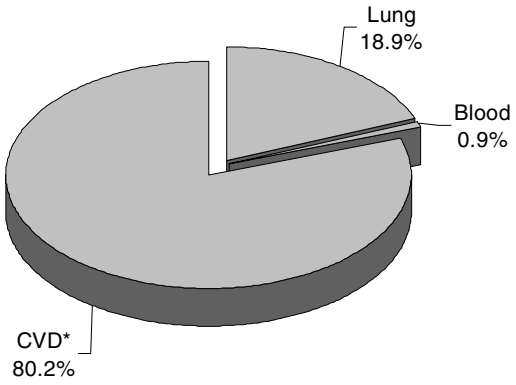
Deaths by Major Causes, U.S., 2001



Total Cardiovascular, Lung, and Blood Diseases 48.0%

* Excludes deaths from pulmonary heart disease (14,000).
† Excludes deaths from blood-clotting disorders and pulmonary embolism (246,000).

Deaths From Cardiovascular, Lung, and Blood Diseases, U.S., 2001



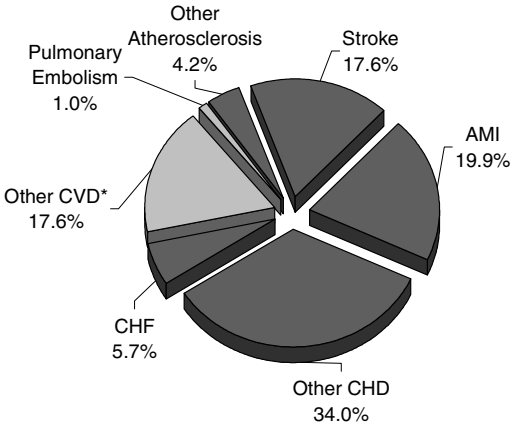
* CVD involving blood clotting (21.2%).

Deaths From Specific Cardiovascular, Lung, and Blood Diseases, U.S., 2001

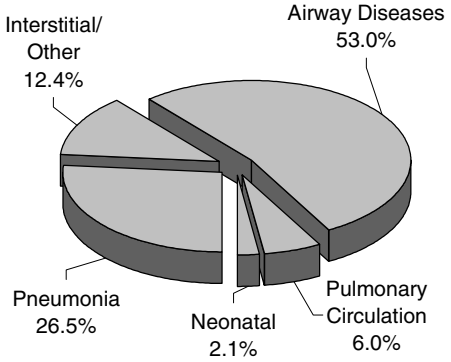
Cause of Death	Deaths (Thousands)		
	Cardiovascular	Lung	Blood
Acute Myocardial Infarction	185	—	126*
Other Coronary Heart Disease	317	—	—
Congestive Heart Failure	53	—	—
Cerebrovascular Diseases (Stroke)	164	—	107*
Other Atherosclerosis	39	—	4*
Pulmonary Embolism	9	9*	9*
Other Cardiovascular Diseases	164	5*	—
Bleeding and Red Blood Cell Diseases	—	—	10
Chronic Obstructive Pulmonary Disease	—	119	—
Asthma	—	4	—
Other Airway Diseases	—	1	—
Pneumonia	—	62	—
Neonatal Pulmonary Disorders	—	5	—
Interstitial Lung Diseases	—	5	—
Lung Diseases Due to External Agents	—	18	—
Other Lung Diseases	—	6	—
Total	**931**	**234**	**256**

* Deaths from clotting or pulmonary disorders are included also as cardiovascular deaths.
Note: Total, excluding overlap, is 1,161,000.
Source: Estimated by the NHLBI from Vital Statistics of the United States, NCHS.

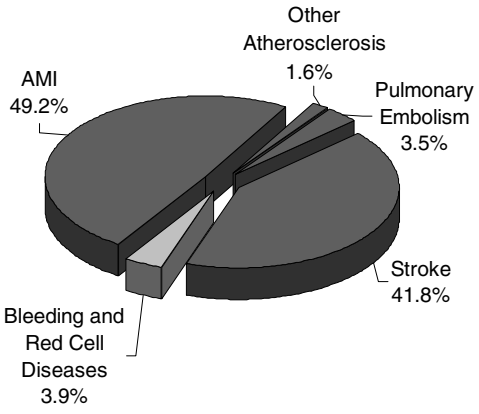
Deaths From Cardiovascular Diseases, U.S., 2001



Deaths From Lung Diseases, U.S., 2001



Deaths From Blood Diseases, U.S., 2001



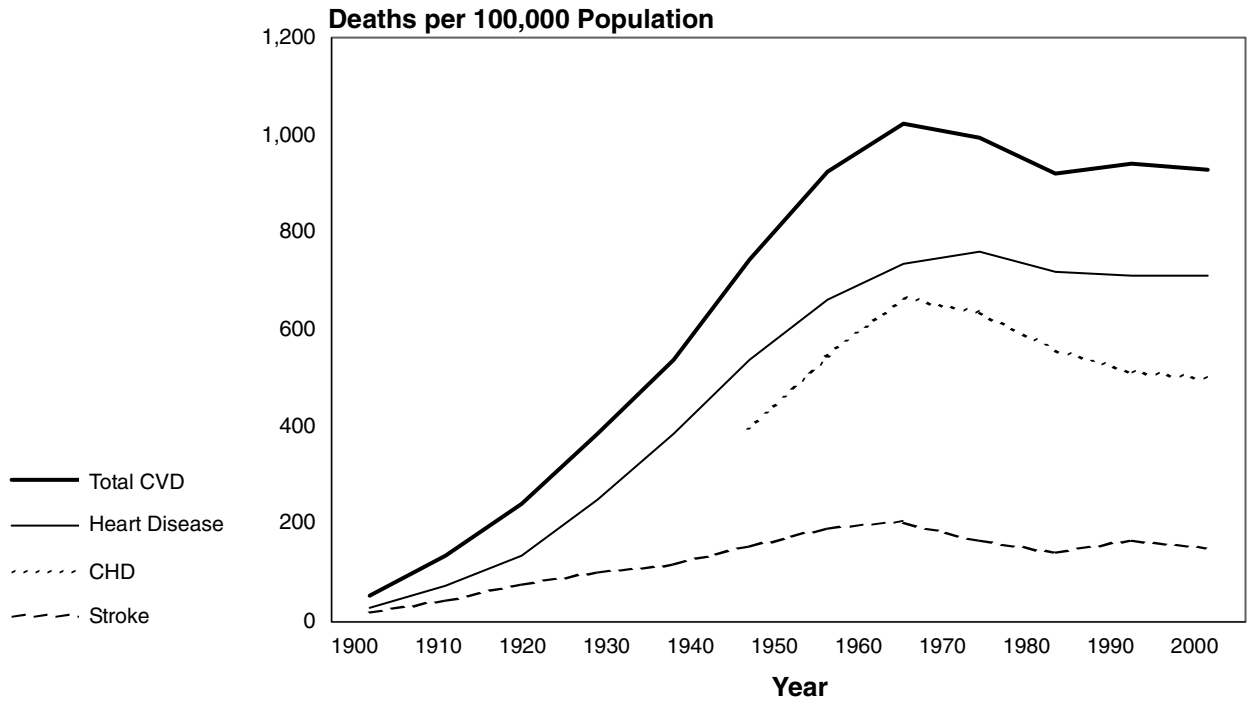
Atherosclerosis-Related Disease 81.4%

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

Blood-Clotting Disorders 96.1%

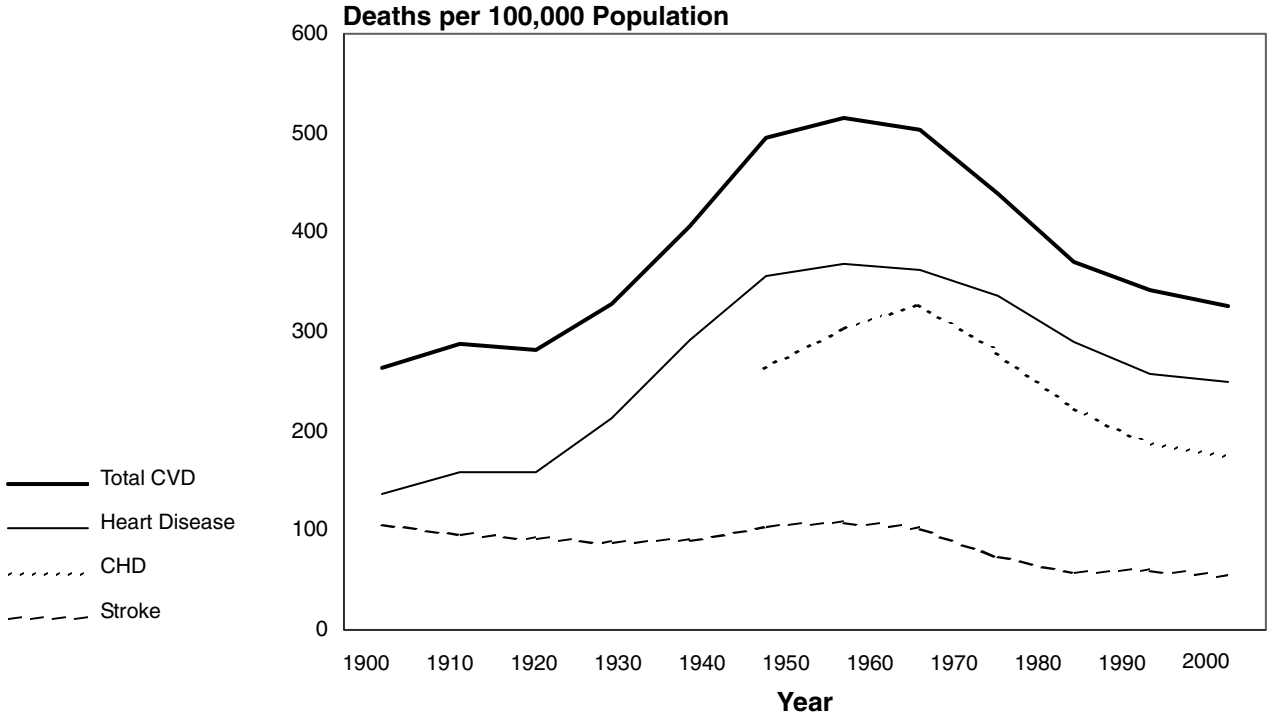
Source: Estimated by the NHLBI from Vital Statistics of the United States, NCHS.

Deaths From Cardiovascular Diseases, U.S., 1900–2001



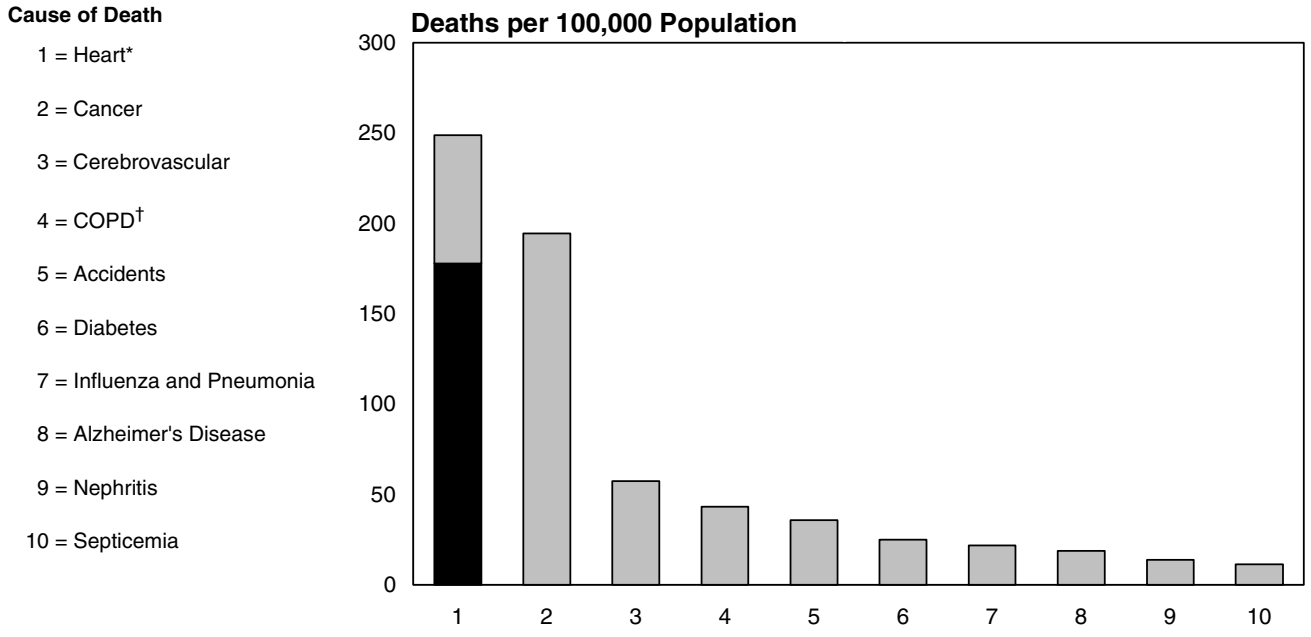
Source: Vital Statistics of the United States, NCHS.

Death Rates* for Cardiovascular Diseases, U.S., 1900–2001



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

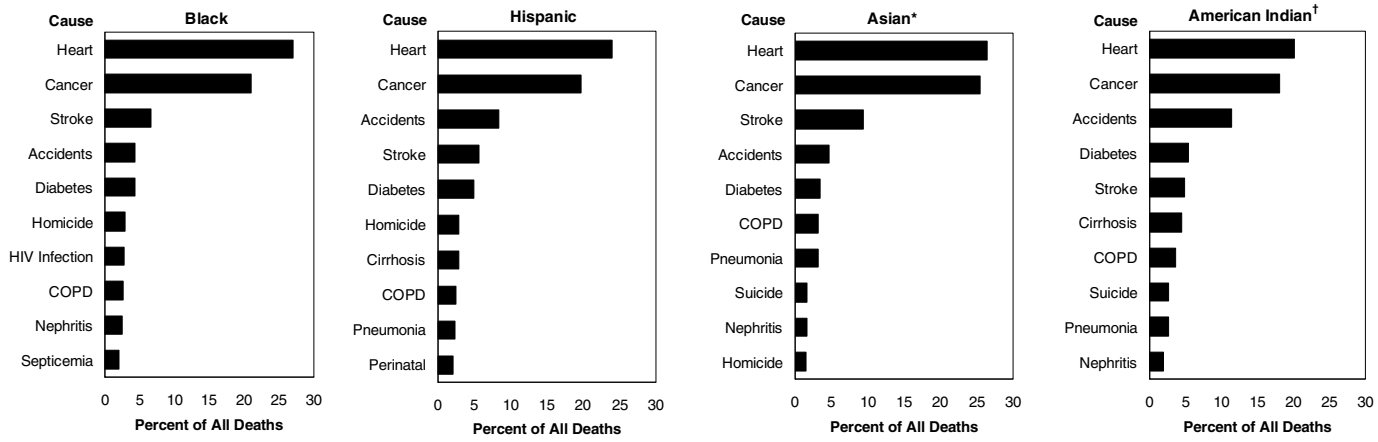
Ten Leading Causes of Death: Death Rates, U.S., 2001



	1	2	3	4	5	6	7	8	9	10
Years of potential life lost (millions)‡	3.3	4.4	0.6	0.5	2.8	0.5	0.2	<0.1	0.2	0.2

* Includes 177.8 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 75 years.
Source: Vital Statistics of the United States, NCHS (preliminary).

Ten Leading Causes of Death Among Minority Groups, U.S., 2001



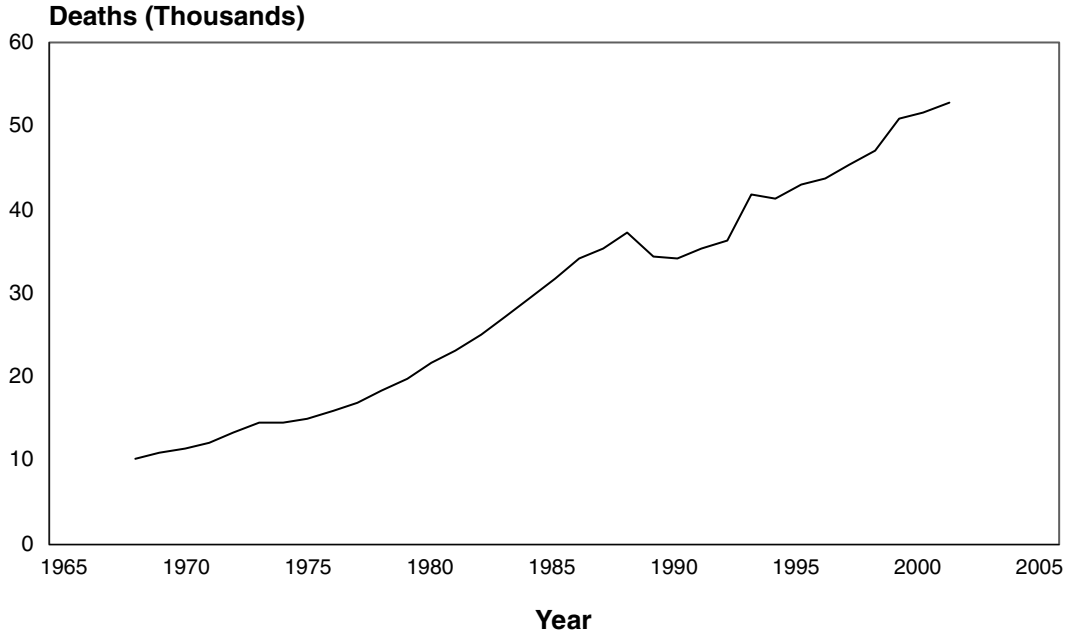
* Includes deaths among individuals of Asian extraction and Asian-Pacific Islanders.
† Includes deaths among Aleuts and Eskimos.
Source: Vital Statistics of the United States, NCHS.

Death Rates* for Cardiovascular and Noncardiovascular Diseases, U.S., 1981 and 2001

Cause of Death	Rate*		Rate Change	Percent Change
	1981	2001		
All Causes	1,007	854	-153	-15
Cardiovascular Diseases	520	329	-191	-37
Coronary Heart Disease	330	178	-152	-46
Stroke	90	55	-35	-39
Other	100	96	-5	-5
Noncardiovascular Diseases	487	525	38	8

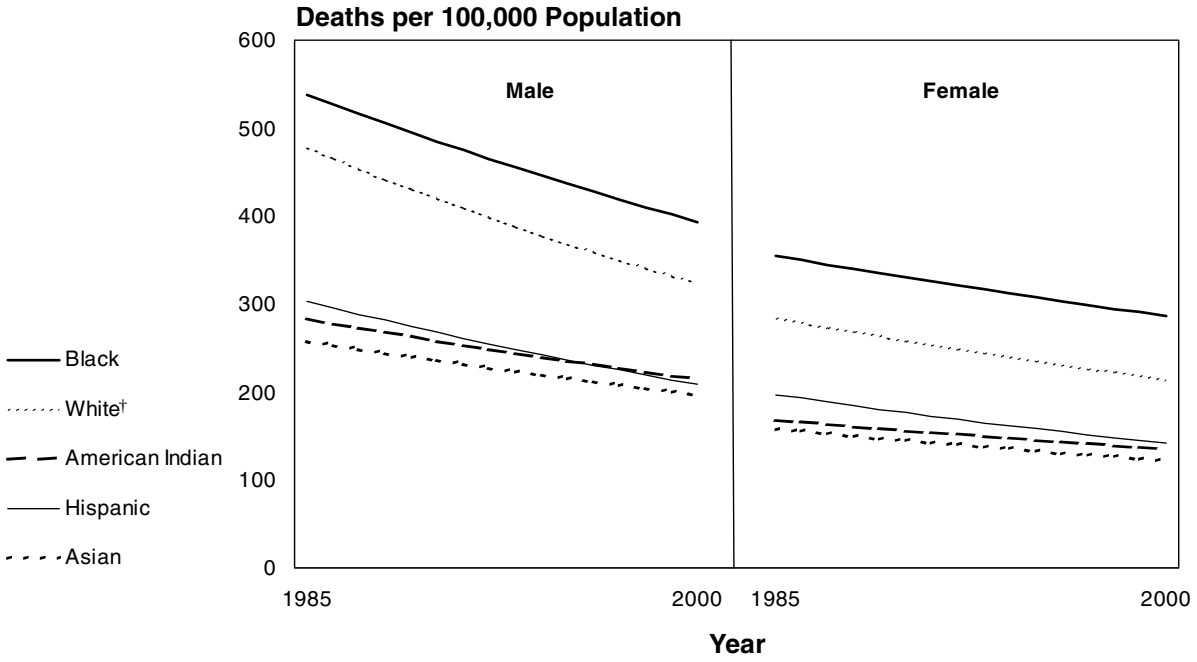
* Age-adjusted; rate per 100,000 population.
Source: Vital Statistics of the United States, NCHS.

Deaths From Congestive Heart Failure, U.S., 1968–2001



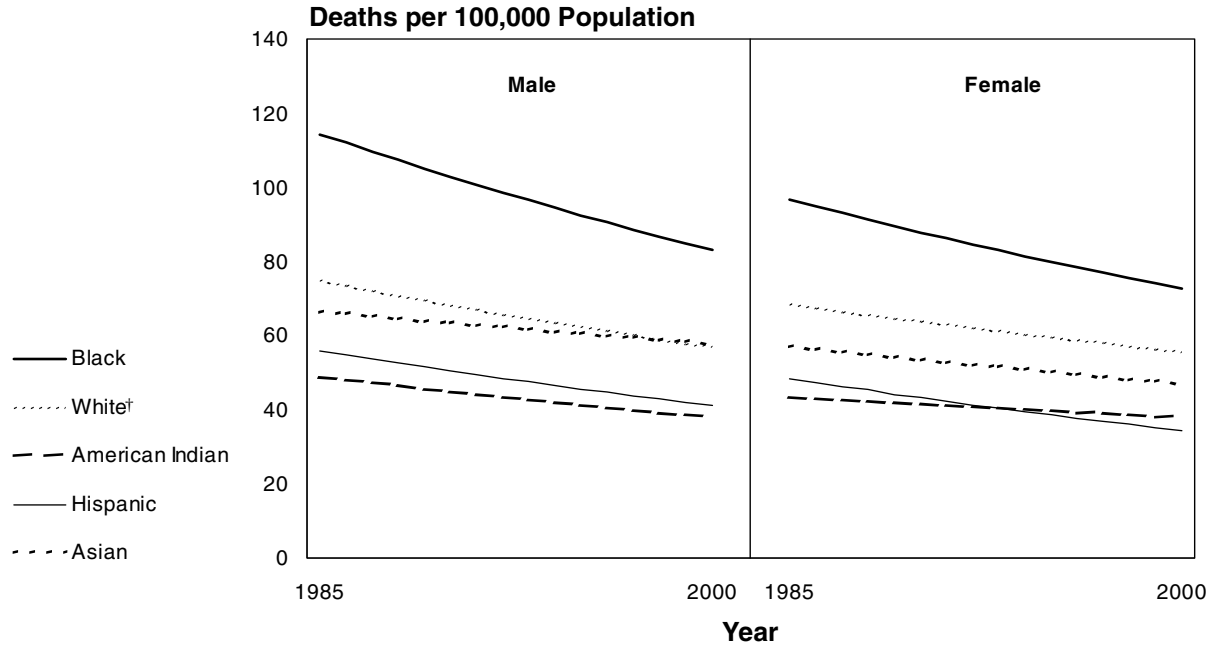
Note: The sharp drop occurring in 1989 is attributed to the revision of the death certificate.
Source: Vital Statistics of the United States, NCHS.

Death Rates* for Heart Disease by Gender, Race, and Ethnicity, U.S., 1985–2000



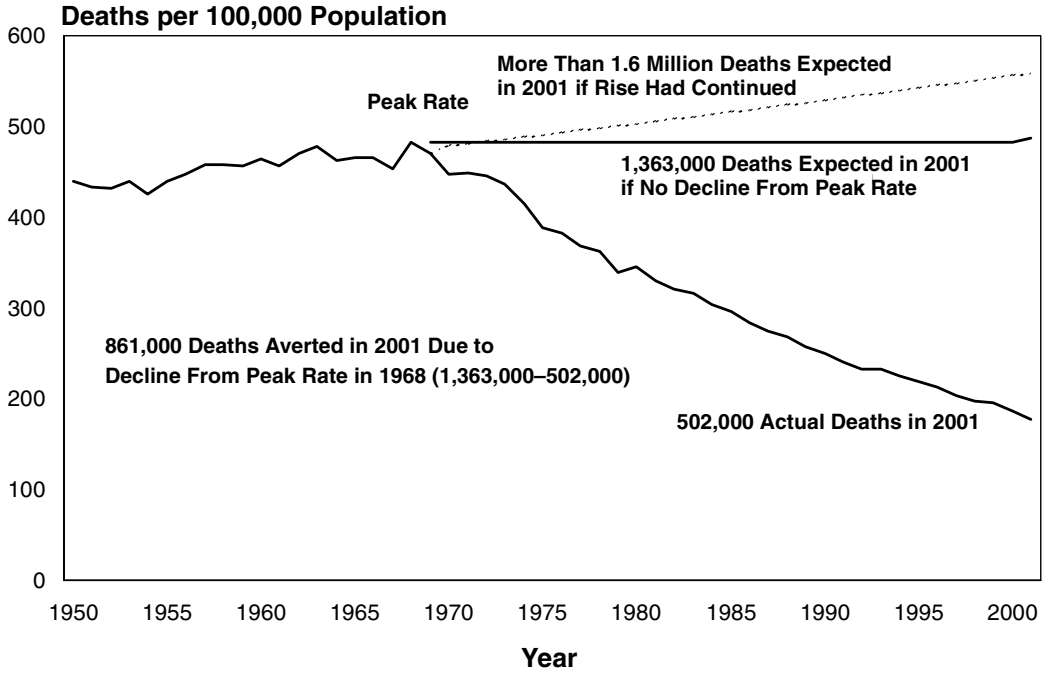
* Age-adjusted.
† Non-Hispanic.
Note: Each line is a log linear regression derived from the actual rates.
Source: Vital Statistics of the United States, NCHS.

Death Rates* for Stroke by Gender, Race, and Ethnicity, U.S., 1985–2000



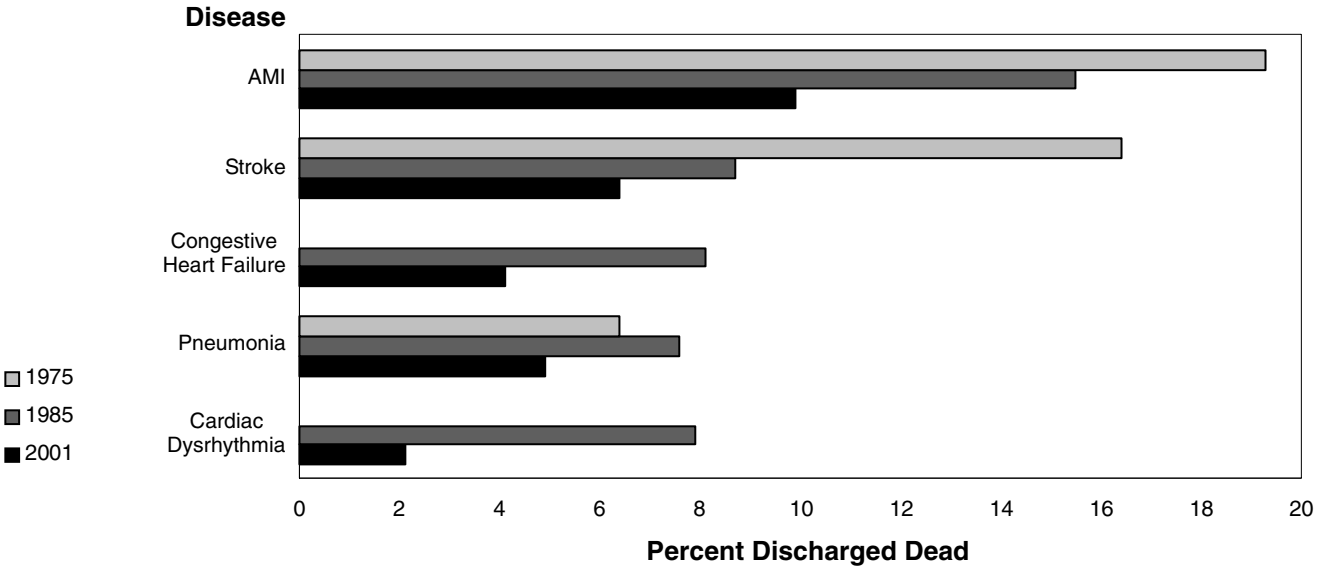
* Age-adjusted.
† Non-Hispanic.
Note: Each line is a log linear regression derived from the actual rates.
Source: Vital Statistics of the United States, NCHS.

Death Rates* for Coronary Heart Disease, U.S., 1950–2001
Actual Rate and Expected Rates if Rise Had Continued or Reached a Plateau



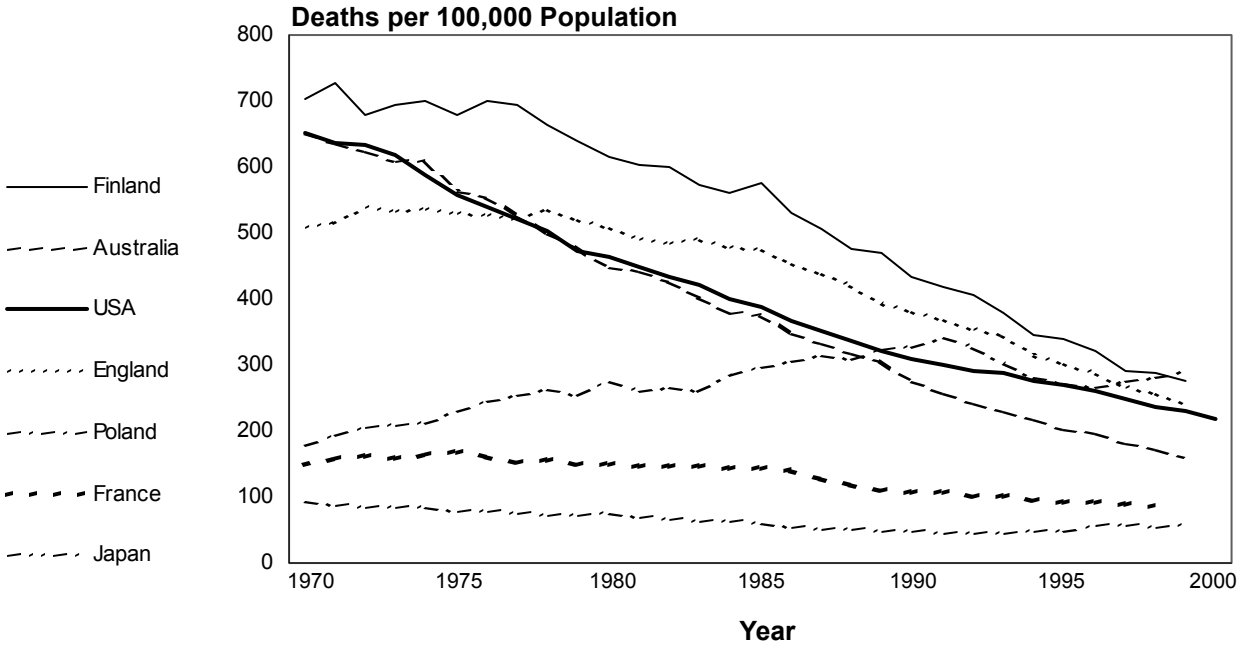
* Age-adjusted.
Source: Vital Statistics of the United States, NCHS.

Common Cardiovascular and Lung Diseases With High Percentage Discharged Dead From Hospitals, U.S., 1975, 1985, and 2001



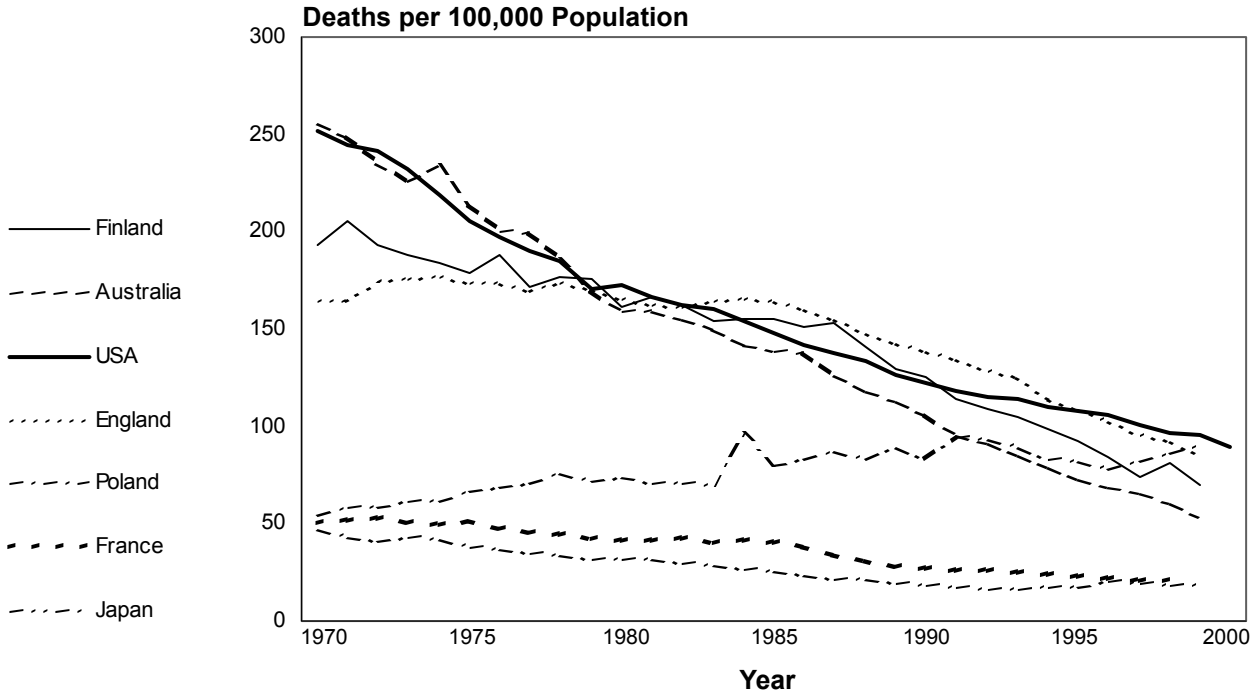
Source: National Hospital Discharge Survey, NCHS.

Death Rates* for Coronary Heart Disease in Men Ages 35–74 Years, Selected Countries, 1970–2000



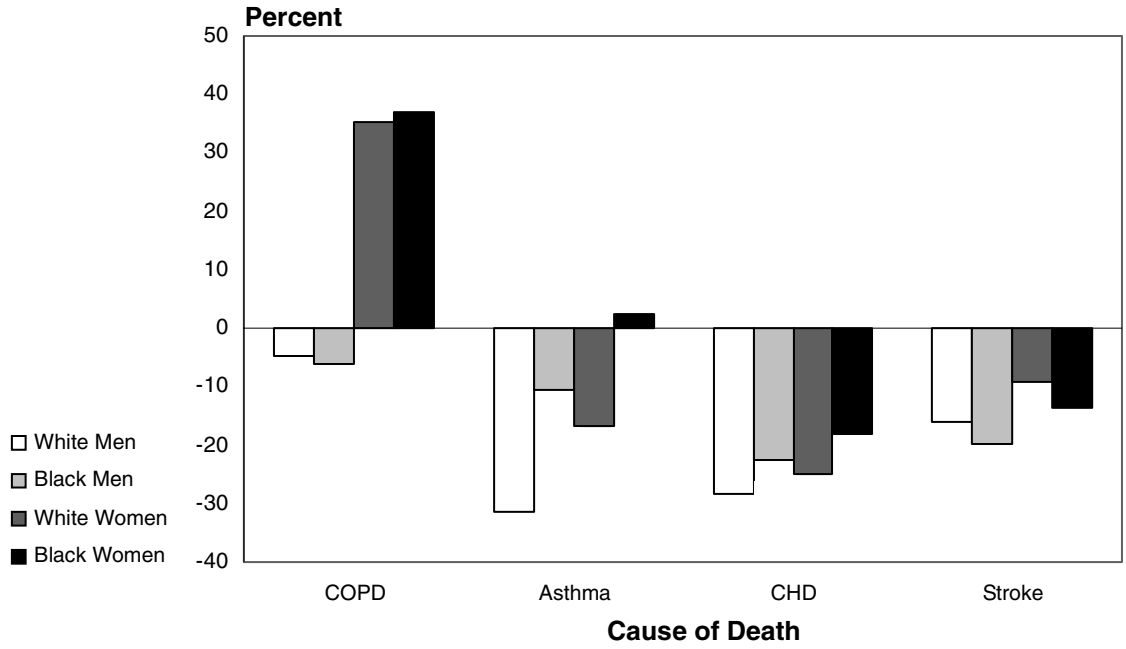
* Age-adjusted to the European Standard Population.
Source: World Health Statistics Annual, World Health Organization (WHO).

Death Rates* for Coronary Heart Disease in Women Ages 35–74 Years, Selected Countries, 1970–2000



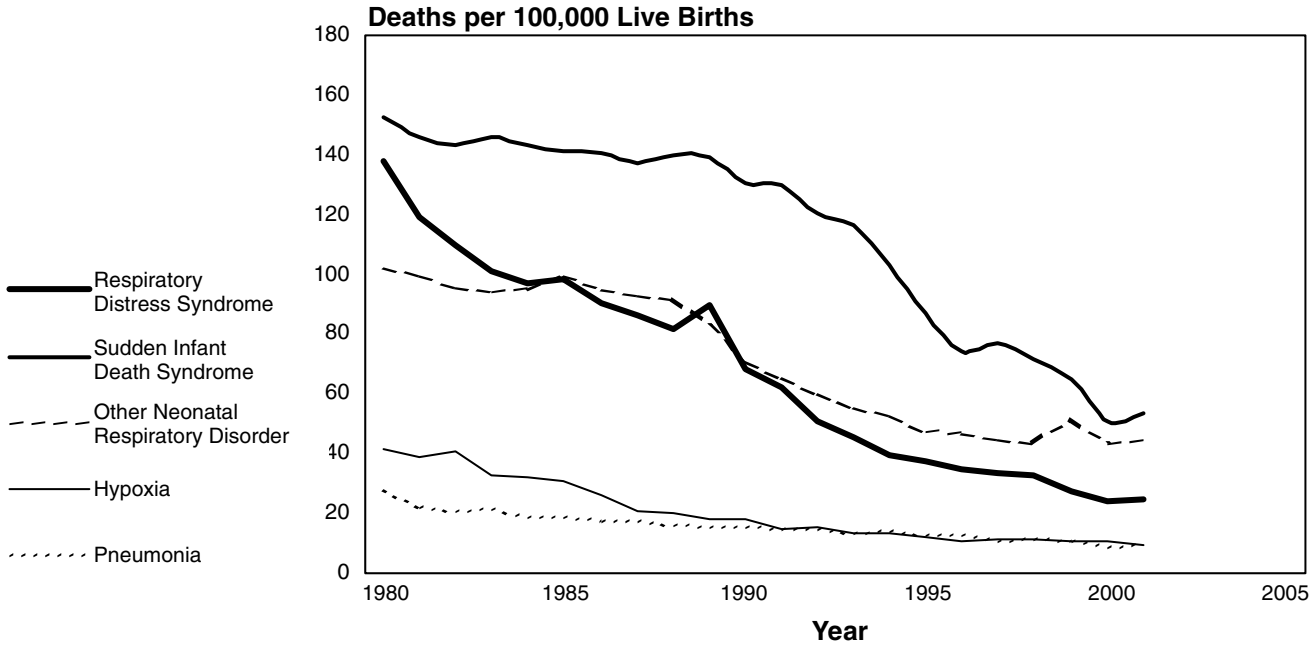
* Age-adjusted to the European Standard Population.
Source: World Health Statistics Annual, WHO.

Change in Death Rates* for Selected Causes by Race and Gender, U.S., 1991–2001



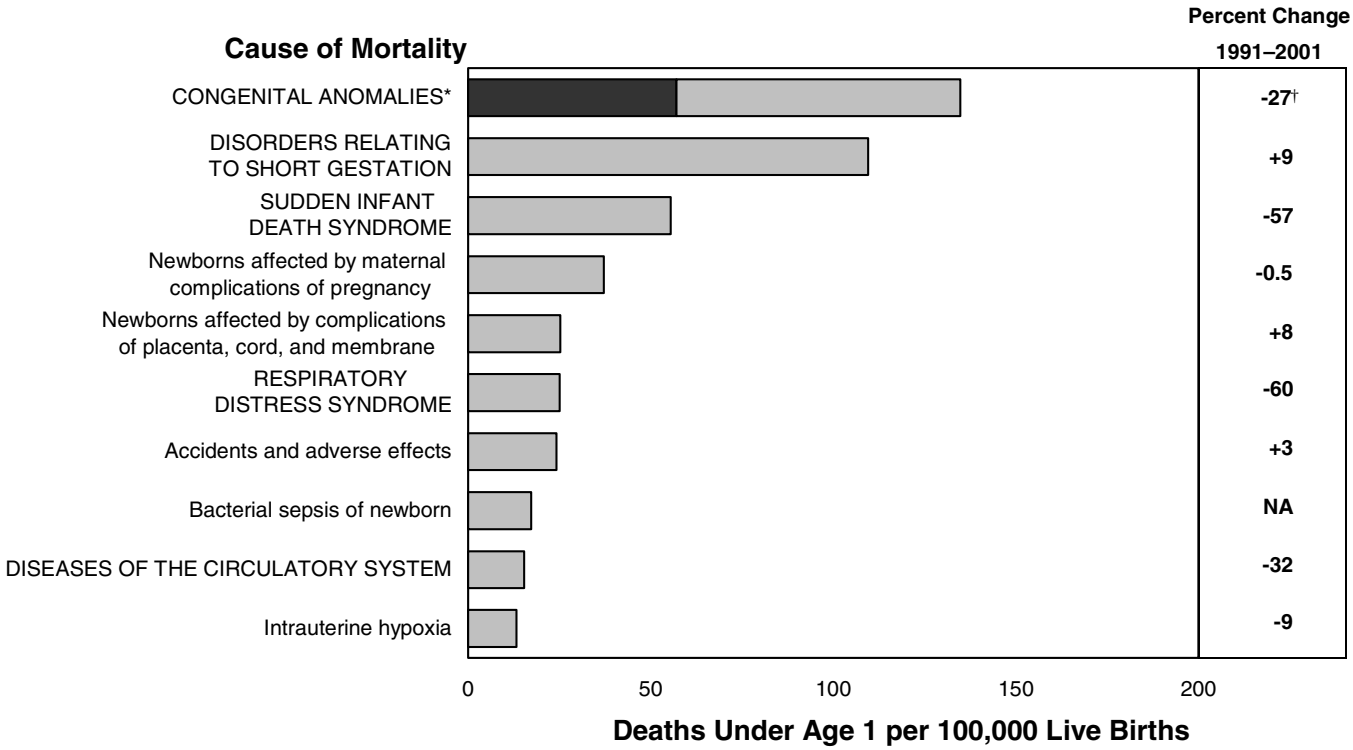
* Age-adjusted.
Source: Vital Statistics of the United States, NCHS.

Death Rates for Lung Diseases in Infants, U.S., 1980–2001



Source: Vital Statistics of the United States, NCHS.

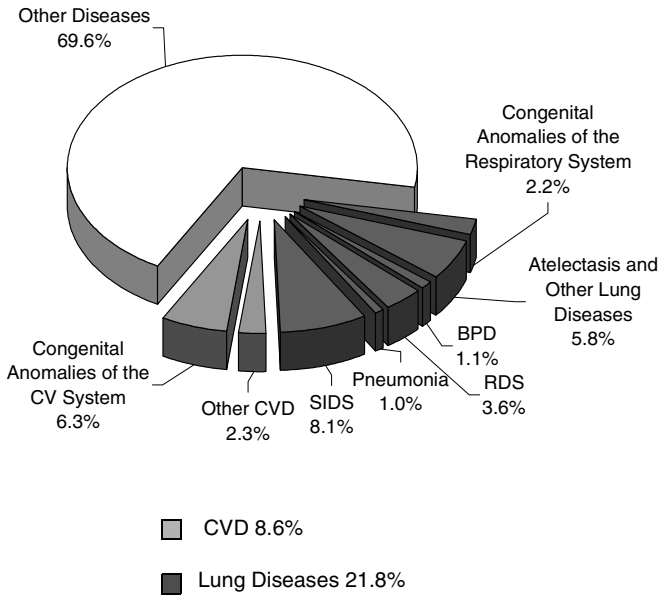
Ten Leading Causes of Infant Mortality, U.S., 2001



* In 2001, congenital CVD and congenital anomalies of the respiratory system represented 42 percent of all infant deaths due to congenital anomalies.
† Between 1991 and 2001, congenital CVD declined 38 percent; congenital anomalies of the respiratory system declined 41 percent; other congenital anomalies declined 14 percent.
NA: Not available.
Note: Capitalization indicates diseases addressed in Institute programs.
Source: Vital Statistics of the United States, NCHS.

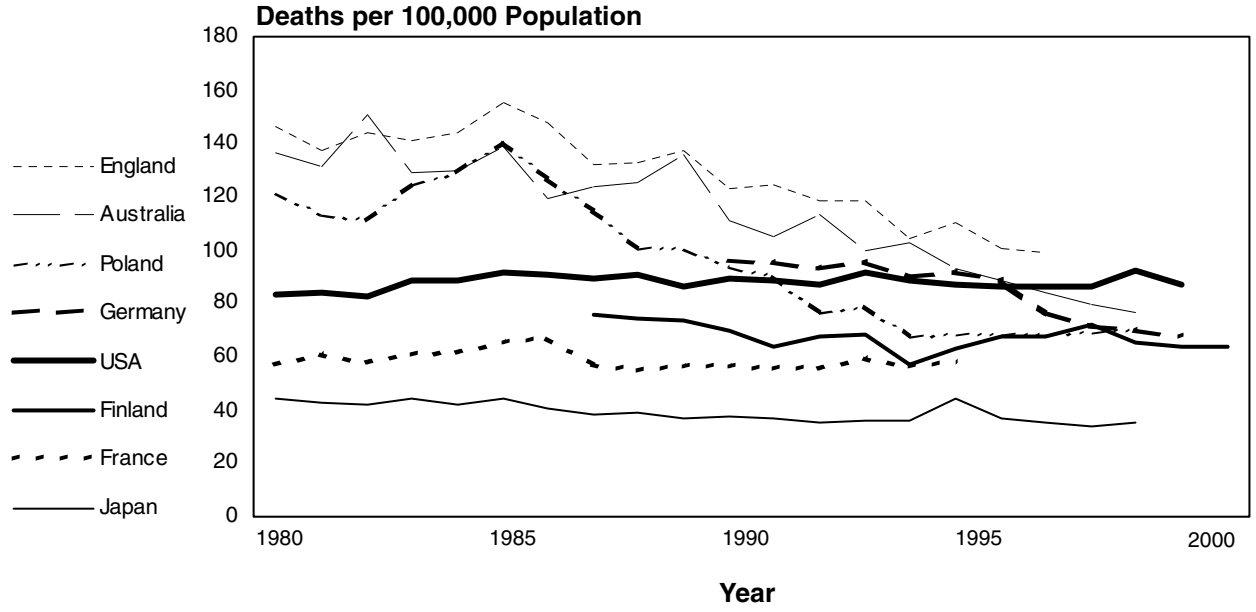
Deaths Under Age 1 Year Due to Cardiovascular and Lung Diseases, U.S., 2001

Cause of Death	Deaths Under Age 1
All Causes	27,568
Cardiovascular Diseases	2,370*
Congenital Anomalies	1,748
Other	622
Lung Diseases	6,015
Sudden Infant Death Syndrome	2,234*
Respiratory Distress Syndrome	1,011*
Pneumonia	292
Bronchopulmonary Dysplasia (BPD)	296
Atelectasis of Newborn	501
Congenital Anomalies	594*
Other Lung Diseases	1,087
Other Diseases	19,183



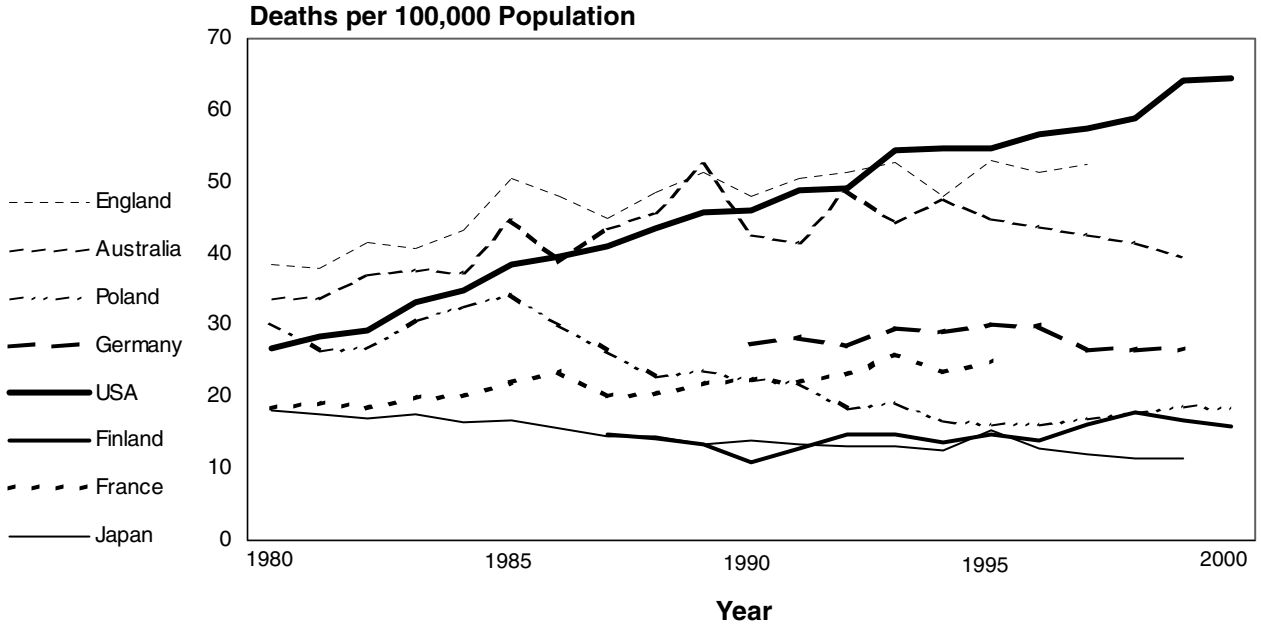
* NHLBI programs address these diseases.
Source: Vital Statistics of the United States, NCHS.

Death Rates* for Chronic Obstructive Pulmonary Disease in Men Ages 35+ Years, Selected Countries, 1980–2000

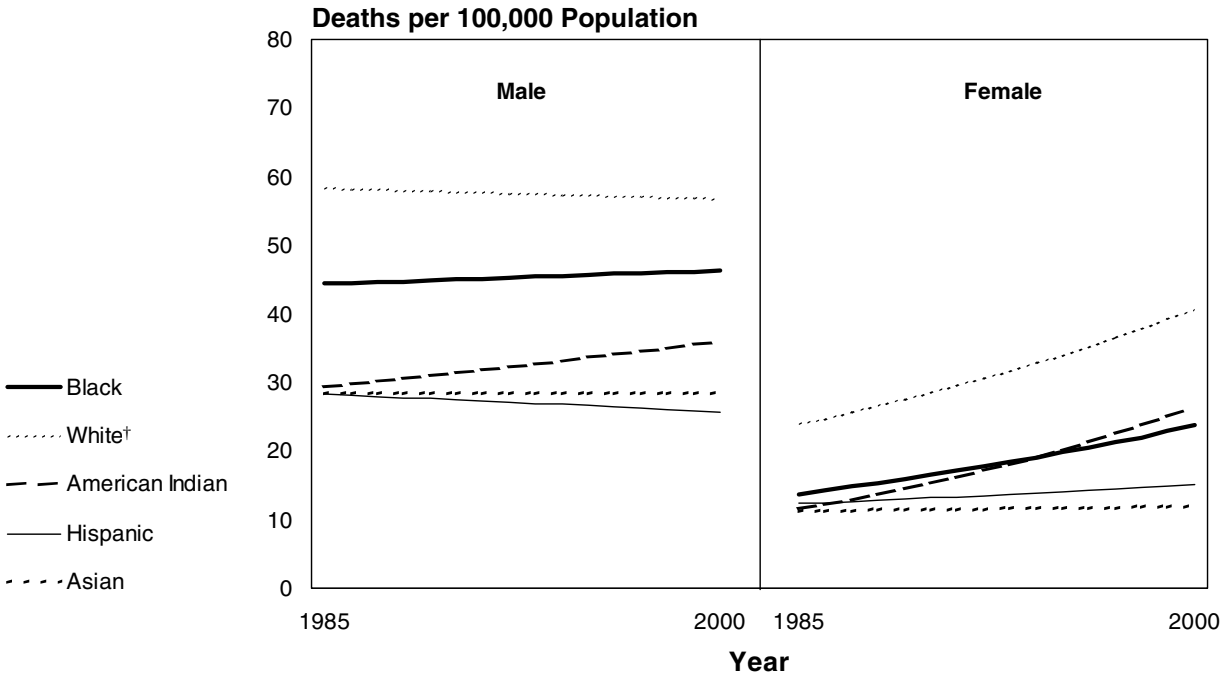


* Age-adjusted to the European Standard Population.
Source: World Health Statistics Annual, WHO.

Death Rates* for Chronic Obstructive Pulmonary Disease in Women Ages 35+ Years, Selected Countries, 1980–2000

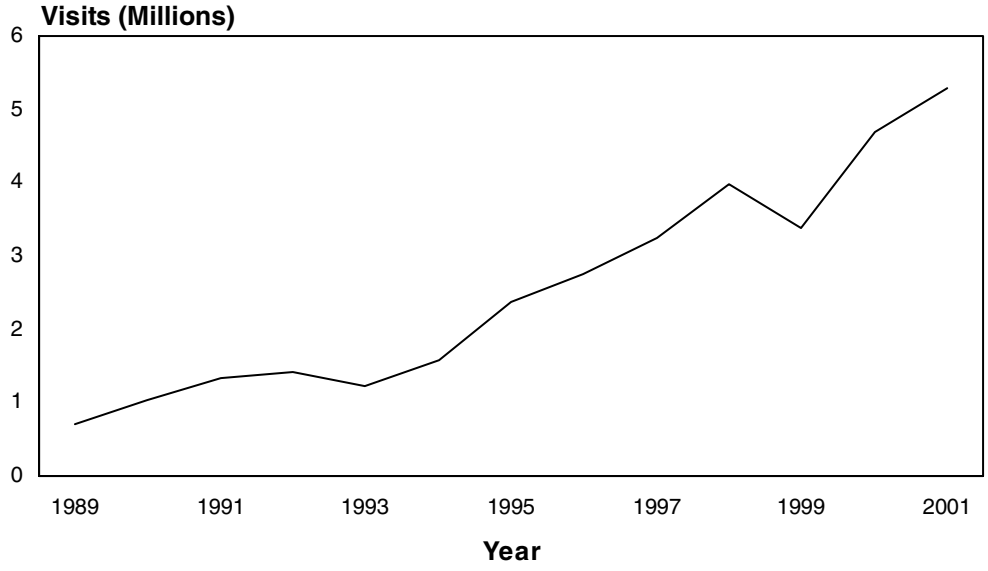


Death Rates* for Chronic Obstructive Pulmonary Disease by Gender, Race, and Ethnicity, U.S., 1985–2000



* 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.

Physician Office Visits for Sleep Disorders, U.S., 1989–2001



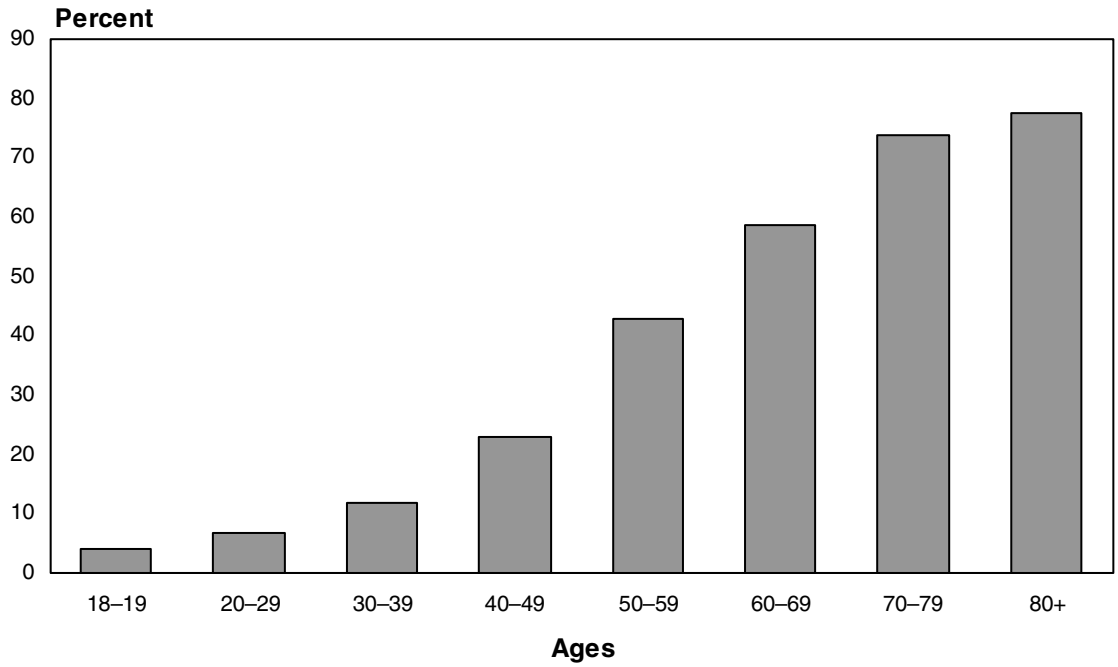
Source: National Ambulatory Medical Care Survey, NCHS.

Prevalence of Common Cardiovascular, Lung, and Blood Diseases, U.S., 2001

Disease	Number
Total Cardiovascular Diseases	64,400,000
Hypertension*	50,000,000
Coronary Heart Disease	13,200,000
Congestive Heart Failure	5,000,000
Stroke	4,800,000
Congenital Heart Disease	1,000,000
Asthma	20,300,000
COPD	12,100,000
Chronic Bronchitis only (age 25+)	9,200,000
Emphysema only (age 25+)	2,000,000
Chronic Bronchitis and Emphysema (age 25+)	900,000
Anemias (all forms)†	3,500,000

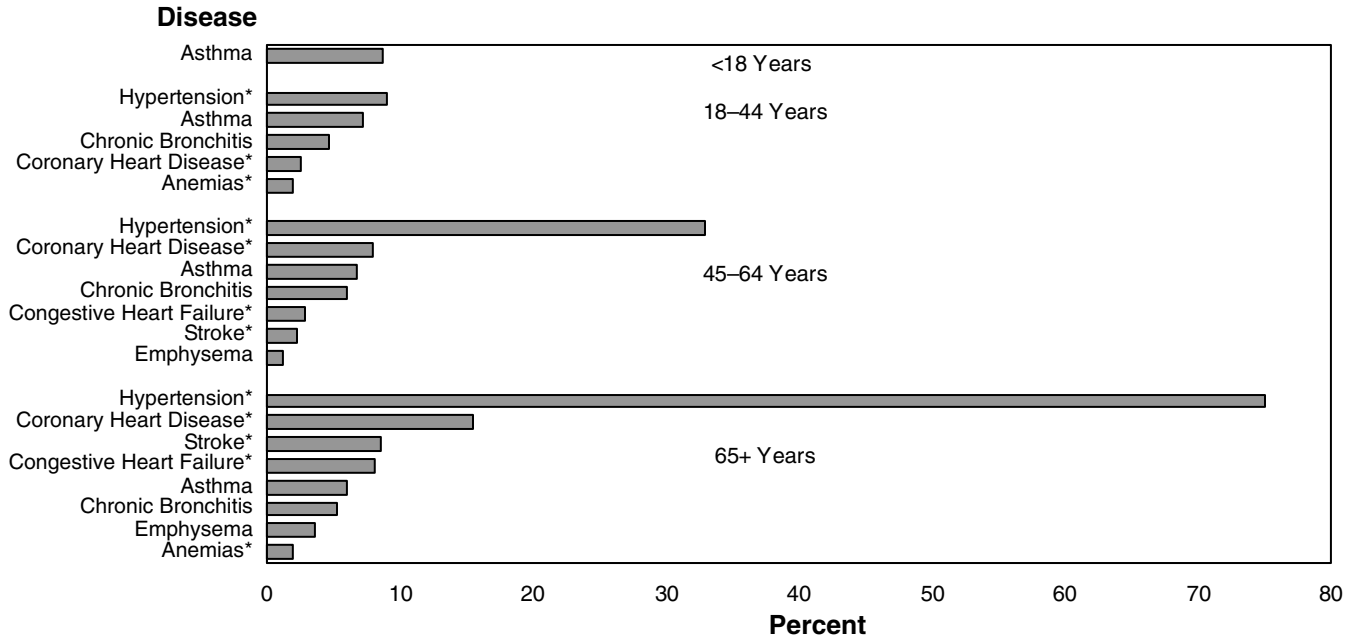
* Systolic blood pressure ≥ 140 mmHg, diastolic blood pressure 90, or on antihypertensive medication.
† For 1996.
Note: Some persons are included in more than one diagnostic group, and persons with more than one form of anemia are counted more than once.
Sources: Extrapolated to United States from National Health and Nutrition Examination Survey (NHANES), 1988–94, and National Health Interview Survey (NHIS), 2001.

Prevalence of Cardiovascular Diseases* in Adults by Age, U.S., 1988–94



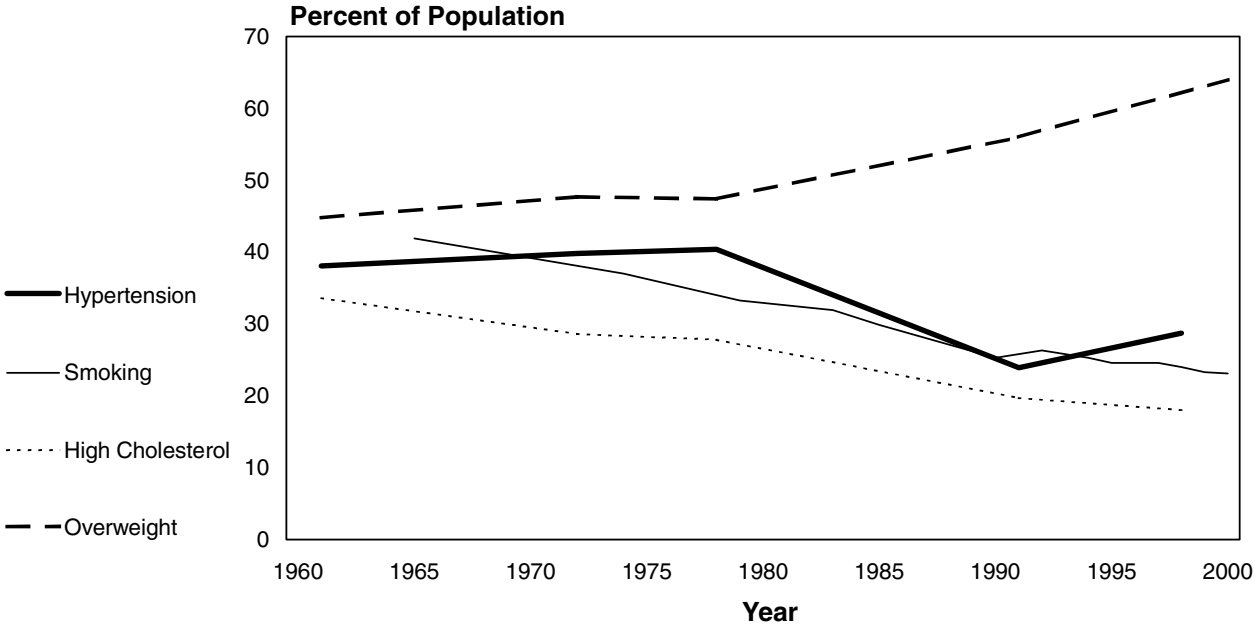
* Hypertension, CHD, cerebrovascular disease, CHF, rheumatic heart disease, or congenital CVD.
Hypertension = systolic blood pressure ≥ 140 mm Hg, diastolic blood pressure ≥ 90, or on antihypertensive medication.
Source: NHANES, 1988–94.

Prevalence of Common Cardiovascular and Lung Diseases by Age, U.S., 2001



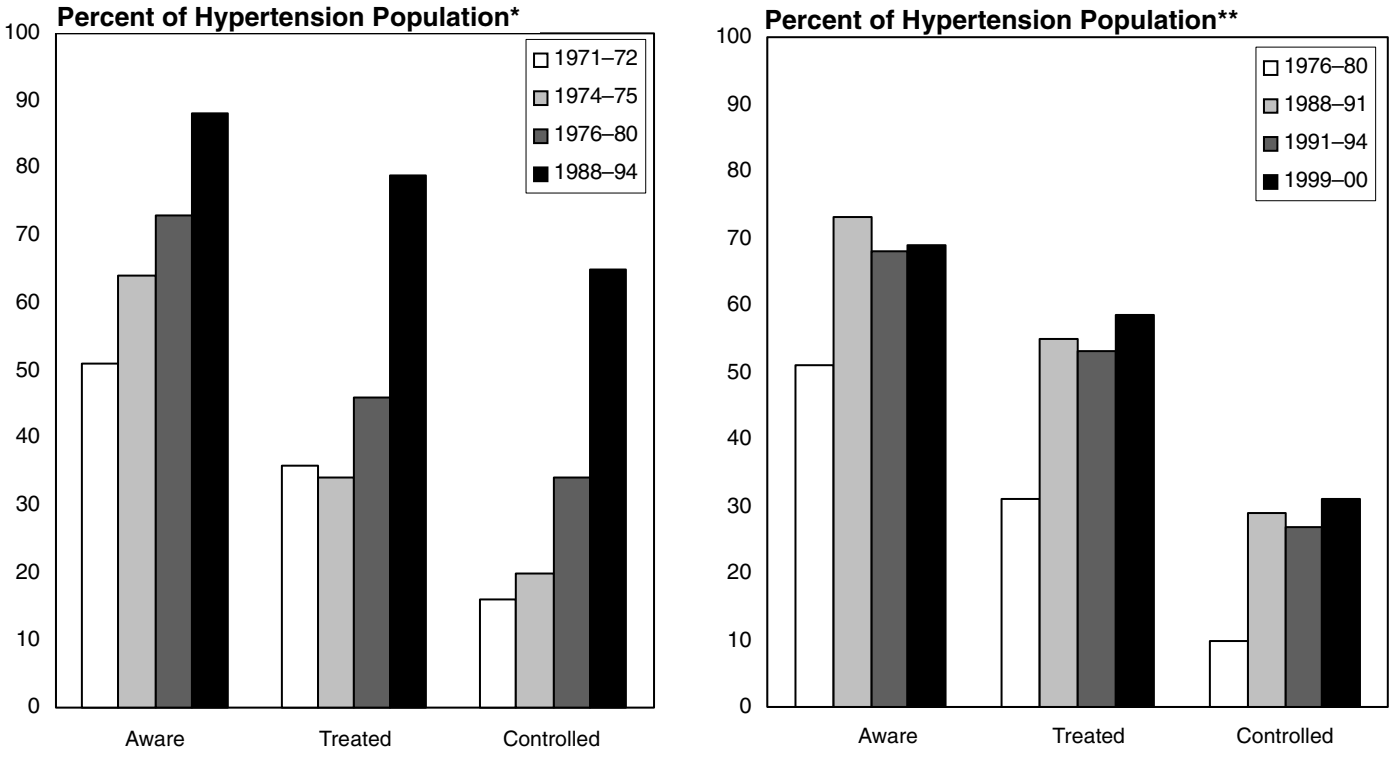
* For 2000.
Note: Numbers depicted in bars are not additive by disease because some persons have more than one disease.
Source: NHIS and NHANES, NCHS.

Prevalence of Cardiovascular Disease Risk Factors* in Adults, U.S., 1961–2000



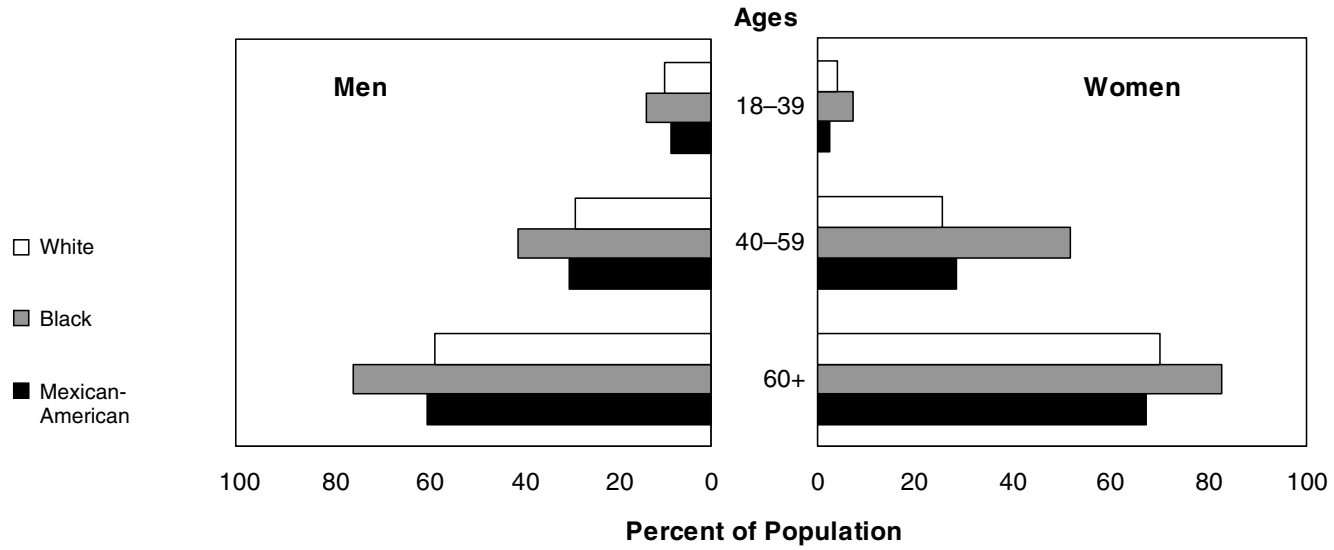
* Age-adjusted.
Note: Hypertension is systolic blood pressure $\geq$ 140, diastolic blood pressure is $\geq$ 90 mmHg, or on antihypertensive medication. High cholesterol is 240+ mg/dl. Overweight is BMI 25+ kg/m^2.
Source: NHIS for smoking and NHANES for the other risk factors (ages 20–74).

Hypertensive Population Aware, Treated, and Controlled, Age 18+, U.S., 1971–72 to 1999–2000



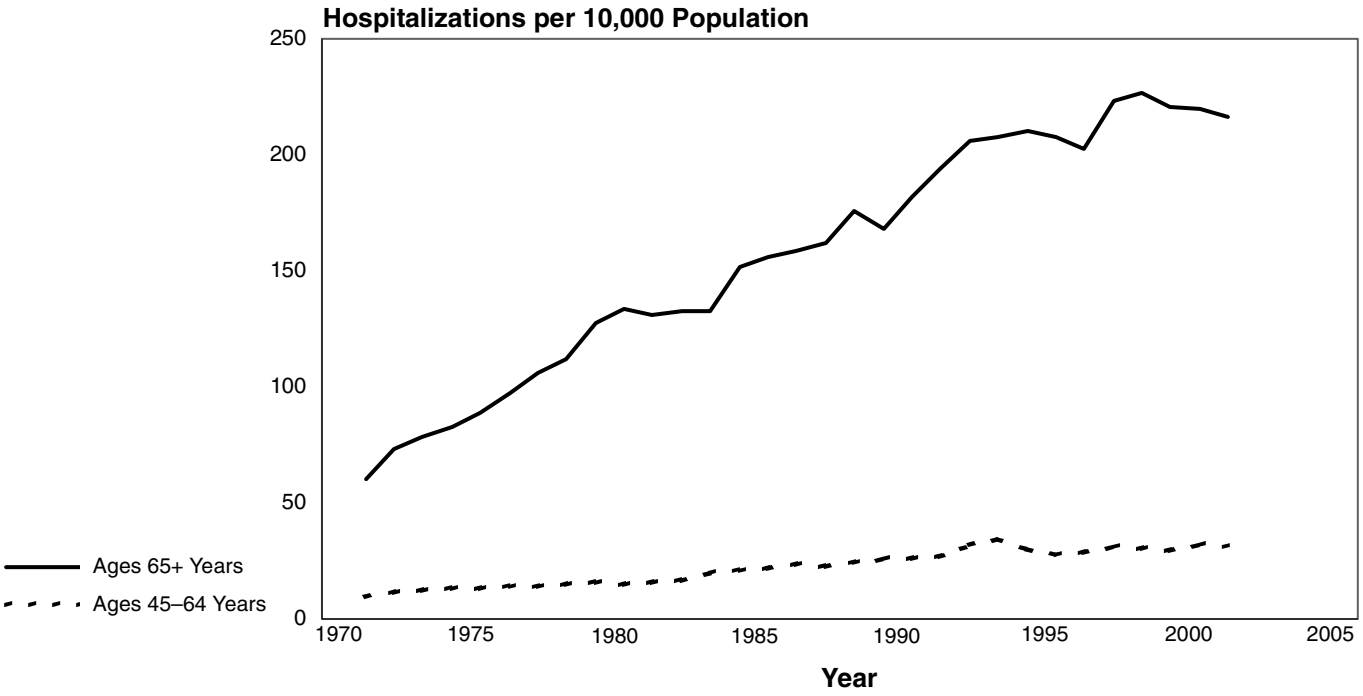
* Systolic blood pressure ≥ 160 mmHg, diastolic blood pressure ≥ 95 mmHg, or on antihypertensive medication.
**Systolic blood pressure ≥ 140 mmHg, diastolic blood pressure ≥ 90 mmHg, or on antihypertensive medication.
Source: NHANES, NCHS.

Adult Population With Hypertension* by Age, Gender, and Race, U.S., 1999–2000



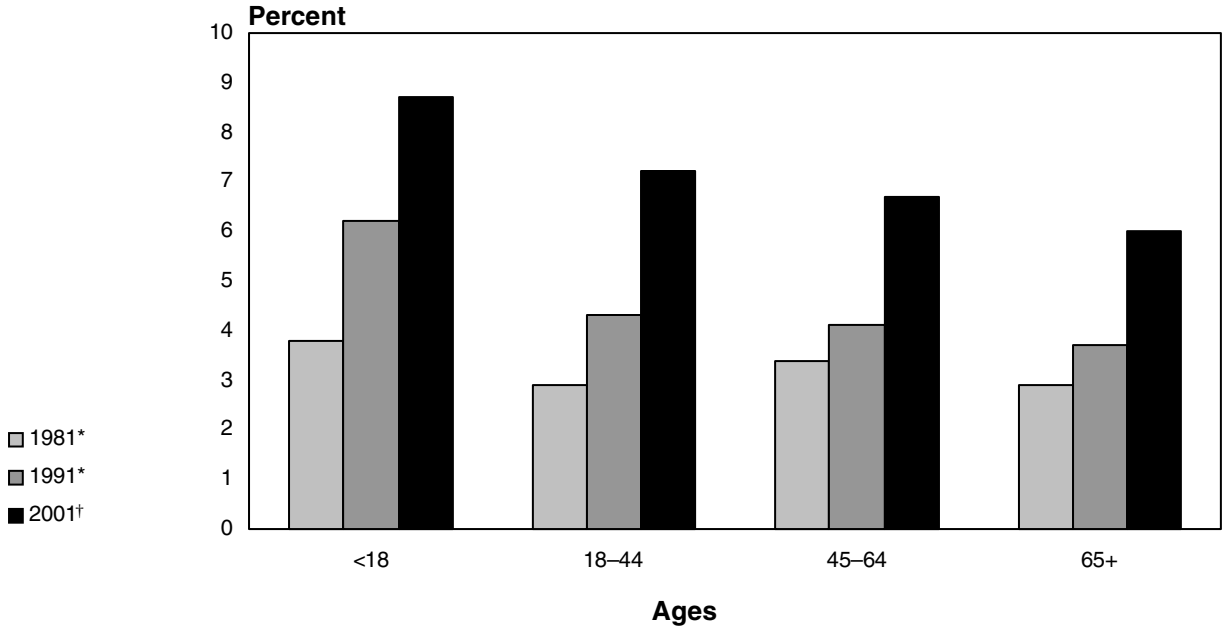
* Systolic blood pressure ≥ 140 mmHg, diastolic blood pressure ≥ 90 mmHg, or on antihypertensive medication.
Source: NHANES, NCHS, and personal communication.

Hospitalization Rates for Congestive Heart Failure, Ages 45–64 Years and 65+ Years, U.S., 1971–2001



Source: National Hospital Discharge Survey, NCHS.

Prevalence of Asthma by Age, U.S., 1981, 1991, and 2001



* Positive response to question: During the past 12 months, did anyone in your family have asthma?
† Positive responses to questions: Has a doctor or other health professional ever told you that you had asthma? Do you still have it?
Note: NCHS changed interview questions, so estimates for 2001 are not comparable with earlier estimates.
Source: NHIS, NCHS.

Direct and Indirect Economic Costs of Illness by Major Diagnosis, U.S., 2004

	Amount (Dollars in Billions)				Percent Distribution			
		Indirect Costs				Indirect Costs		
	Direct Costs*	Morbidity†	Mortality‡	Total	Direct Costs	Morbidity	Mortality	Total
Cardiovascular Disease	226.7	33.6	108.1	368.4	14.7	17.0	20.9	16.0
(including Blood Clotting)§	(53.3)	(7.4)	(25.5)	(86.5)	(3.5)	(3.7)	(4.9)	(3.8)
Lung Diseases**	75.9	25.9	30.1	131.9	4.9	13.1	5.8	5.9
Blood Diseases	8.0	0.7	2.8	11.5	0.5	0.4	0.5	0.4
Subtotal	310.6	60.2	141.0	511.8	20.1	30.4	27.2	22.9
Diseases of the Digestive System	158.2	10.2	23.2	191.6	10.3	5.2	4.5	8.4
Neoplasms	69.4	16.9	103.5	189.8	4.5	8.5	20.0	8.2
Mental Disorders	124.1	26.0	7.9	158.0	8.0	13.1	1.5	6.9
Diseases of the Nervous System	127.2	7.7	11.3	146.2	8.2	3.9	2.2	6.4
Diseases of the Musculoskeletal System	88.3	20.2	2.6	111.1	5.7	10.2	0.5	4.9
Diseases of the Genitourinary System	65.3	5.2	5.6	76.1	4.2	2.6	1.1	3.3
Endocrine, Nutritional, and Metabolic Diseases	61.5	6.5	17.3	85.3	4.0	3.3	3.3	3.8
Infectious and Parasitic Diseases	31.4	12.0	26.6	70.0	2.0	6.1	5.1	3.2
Diseases of the Skin	34.7	1.6	0.5	36.8	2.2	0.8	0.1	1.6
Other Respiratory Diseases	43.2	8.0	3.0	54.2	2.8	4.0	0.6	2.4
Other and Unallocated to Diseases	426.9	23.3	175.41	625.6	27.7	11.8	33.9	27.3
Total	**$1,540.8**	**$197.8**	**$517.9**	**$2,256.5**	**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 2004 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 2004 total by type of direct cost.

† Morbidity costs were estimated for 2004 by multiplying NCHS estimates for 2003 by a 3.7 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 2004 by first multiplying the number of deaths in 2000 in each age- and sex-specific group by the 2000 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 2000–2004 inflation factor (1.20) based on change in mean earnings.

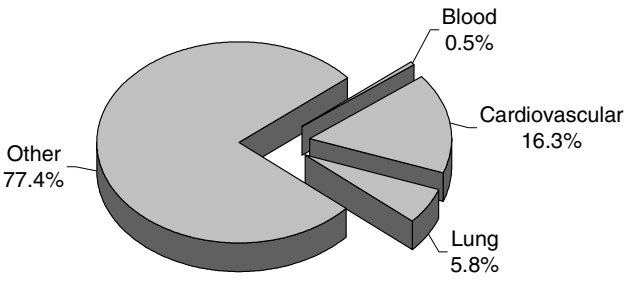
§ Costs of blood-clotting disease are estimated from predetermined proportions of CVD morbidity and mortality statistics for MI, cerebrovascular diseases, and diseases of arteries.

** Does not include lung cancer or leukemia.

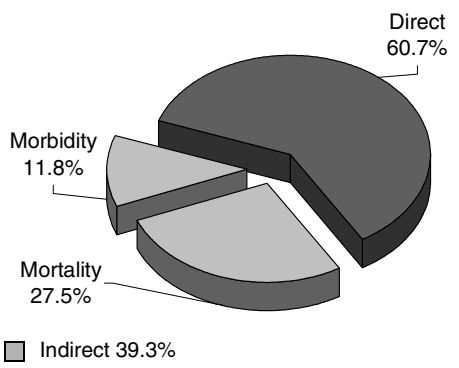
Note: Numbers may not add to totals due to rounding.

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., 2004



Economic Costs: Cardiovascular, Lung, and Blood Diseases, U.S., 2004



5. Institute-Initiated Programs Starting in FY 2003

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 numerous and extensive discussions and thorough reviews by representatives of the scientific community, Institute advisory committees or special emphasis panels, the Board of Extramural Advisors (BEA), and the National Heart, Lung, and Blood Advisory Council (NHLBAC). The advisory committees, special emphasis panels, 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 competing 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 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 workloads, 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 in FY 2003 are presented below according to NHLBI scientific program. Also described are trans-NIH initiatives in which the NHLBI is participating.

Heart and Vascular Diseases Program

New Initiatives

Clinical Research in Peripheral Artery Disease

The purpose of this RFA is to develop improved therapeutic and preventive approaches for atherosclerotic arterial diseases of the peripheral vasculature. Objectives include elucidating biological mechanisms associated with initiation, progression, and outcomes of the disease; enhancing early detection by developing improved biomarkers, imaging approaches, and other relevant biomedical technologies; and developing innovative therapeutic and preventive strategies.

Pathophysiologic Mechanisms of Obesity-Associated Cardiovascular Disease

The purpose of this initiative is to stimulate research on the biologic basis of obesity-related CVD, including atherosclerosis, hypertension, heart failure, cardiomyopathies, and arrhythmias/sudden death. The objective is to elucidate the basic and clinical mechanisms associated with development of obesity-related CVD.

Lung Diseases Program

Initiatives Being Renewed

Asthma Clinical Research Network (ACRN)

The purpose of this renewal is to continue support for a network of clinical centers and a data coordinating center to assess innovative treatments for asthma and to ensure that the findings will be disseminated to clinicians and other health care workers.

Specialized Centers of Research (SCOR) in Neurobiology of Sleep and Sleep Apnea and Airway Biology and Pathogenesis of Cystic Fibrosis

The objective of this renewal is to foster multidisciplinary research to enable basic science results to be applied more rapidly to clinical problems. The SCOR in Neurobiology of Sleep and Sleep Apnea is studying the etiology and consequences of sleep disorders, particularly sleep apnea. The SCOR in CF is focusing on the role of the CF transmembrane conductance regulators in airway biology and CF phatogenesis. Research findings should identify new targets and strategies for clinical treatment.

New Initiatives

Coordination of Vascularization and Lung Development

The purpose of this RFA is to stimulate research on the cellular and molecular mechanisms involved in the formation of the lung and its vasculature during normal and abnormal lung development that will be useful to investigators seeking to develop therapeutic interventions to reverse arrested alveolization, a feature of chronic lung disease in very-low-birth-weight premature infants. Understanding the influence of parallel development of the lung and its vasculature also may yield information useful in preventing the comorbid conditions later in life.

COPD Clinical Research Network

The purpose of this RFA is to establish a clinical research network to conduct multiple, short-term, multicenter therapeutic intervention trials in patients with moderate-to-severe COPD.

Molecular Mechanisms of Mucous Cell Metaplasia and Excess Mucous Secretion in Human Airway Diseases

The purpose of this RFA is to promote research on molecular and cellular mechanisms involved in hypersecretion of mucus and mucous cell metaplasia in chronic airway diseases such as COPD, asthma, CF, and other chronic bronchitic conditions. Scientists seek to develop innovative therapeutic agents for clinical modulation of mucous function in airway diseases.

Molecular Target and Drug Discovery for Idiopathic Pulmonary Fibrosis

The purpose of this RFA is to encourage the development of innovative therapeutic approaches for pulmonary fibrosis. Objectives include discovering and validating molecular targets for interfering with fibrogenesis and identifying agonists or antagonists that interact with them or with other previously identified targets to attenuate, halt, or reverse the fibrotic process.

Specialized Centers of Clinical Research (SCCOR) in Translational Research in Acute Lung Injury

The objective of this SCCOR is to investigate the pathogenesis and treatment of early acute lung injury. Researchers will examine multiple pathways in the injury and repair process. Emphasis is on translating basic research advances into clinical applications. At least 50 percent of the projects will be clinically oriented and involve direct patient contact.

Blood Diseases and Resources Program

Initiatives Being Renewed

Comprehensive Sickle Cell Centers

The purpose of this renewal is to continue support for 10 Sickle Cell Centers to be engaged in multidisciplinary research directed toward developing innovative therapies for SCD. Scientists are also looking for a cure for the disease. The centers offer career development for young investigators in SCD research, patient service activities, and community outreach.

Retrovirus Epidemiology Donor Study (REDS)

The purpose of this renewal is to continue support for studies on volunteer blood donors to ensure the safety

and availability of the Nation's blood supply. Research includes monitoring known blood-born infectious agents, evaluating rapidly the impact of emerging pathogens, assessing safety implications of changes in laboratory and blood donor screening protocols, and examining blood supply availability issues.

New Initiatives

Mechanisms of Fetal Hemoglobin Gene Silencing for Treatment of Sickle Cell Disease and Cooley's Anemia

The purpose of this RFA is to identify mechanisms of fetal hemoglobin (gamma-globin) gene silencing during normal human development and of variable silencing in adults and to apply that knowledge to develop new approaches to inhibit silencing.

Somatic Cell Therapy Processing Facilities

The purpose of this RFP is to establish three centralized facilities for developing cellular therapies. The facilities will assist investigators by providing support in basic science, the developmental phase of new therapies, and, eventually, in human trials.

Trans-NHLBI

New Initiatives

Ancillary Pharmacogenetics Studies in Heart, Lung, and Blood Disease Trials

The purpose of this RFA is to conduct pharmacogenetic research in ongoing or completed clinical trials and studies related to heart, lung, blood, and sleep disorders. Investigators will examine genetic influences on inter-individual differences in prescription drug response. The goal is to optimize drug treatment in individual patients and mitigate serious adverse response or lack of response to therapy.

Basic Research on Mesenchymal Stem Cell Biology

The purpose of this RFA is to stimulate basic research on mesenchymal stem cell biology and to use the acquired knowledge as the basis for clinical application of mesenchymal stem cells to hematopoietic and non-hematopoietic stem cell transplantation. Preclinical studies suggest that mesenchymal stem cells facilitate hematopoietic stem cell transplantation while decreasing immune rejection of allogenetic transplants.

Cell-Based Therapies for Heart, Lung, Blood, and Sleep Disorders

The purpose of this RFA is to support basic research on stem cell biology and the use of stem cells in cellular therapies for cardiovascular, lung, and blood diseases and sleep disorders. Ultimately, the goal is to develop regenerative and reparative therapies.

Functional Heterogeneity of the Peripheral, Pulmonary, and Lymphatic Vessels

The purpose of this RFA is to encourage research on cellular and molecular mechanisms that contribute to functional heterogeneity of adult peripheral, pulmonary, and lymphatic vessels. Research findings should provide insight into the pathogenesis of peripheral vascular, pulmonary, and lymphatic diseases and lead to new and more effective treatments.

Minority K-12 Initiative for Teachers and Students (MKITS)

The purpose of this initiative is to develop a science curriculum for minority students in kindergarten through 12th grade that will encourage them to pursue studies in biomedical and behavioral sciences. The program will also train teachers to enable them to enhance the scientific knowledge, skills, and research experience of their students.

NHLBI Competitive Supplements for Human Embryonic Stem Cell Research

The purpose of this PA is to provide training to NHLBI grantees in the use of human embryonic stem cell lines. The research proposed in the supplement should be within the scope of an existing NHLBI grant and may not expand its original scope.

NHLBI Innovative Research Grant Program

The objective of this PA is to explore new approaches to heart, lung, and blood diseases and sleep disorders through analysis of existing data or use of existing biological specimens. Studies should be designed to provide preliminary results to demonstrate the feasibility of innovative approaches.

Nonhuman Primate Models of HIV-Associated Pulmonary, Cardiovascular, and Hematological Disorders

The purpose of this program is to stimulate research on the use of nonhuman primate models (e.g., simian immunodeficiency virus (SIV)- and simian-human immunodeficiency virus (SHIV)-infected monkeys) for

the study of HIV-associated pulmonary, cardiovascular, and hematologic disorders. The primate models should be designed to facilitate the study of the biological and clinical characteristics of disorders of the heart, lung, blood, and bone marrow associated with HIV infections and coinfections and to evaluate innovative methods for their prevention and treatment.

Trans-NIH

Initiative Being Renewed

Rat Genome Database

The purpose of this renewal is to continue a unique, ongoing resource for a limited time. The rat genome database contains data generated from rat genetic, genomic, and related research efforts; its function is to provide a knowledge base for rat model research in the United States and for investigators needing knowledge of rat biology to guide research in human disease.

New Initiative

National Swine Research and Resource Center

The purpose of this RFA is to establish a national resource center for deposit, maintenance, preservation, and distribution of swine models that will be made available for the study of human health and disease. The center will also be a resource for cryopreservation, storage, and reconstitution of swine embryos and germplasm. The RFA will support the development of methods for improving the health of swine strains and the characterization of diseases endemic to laboratory swine stocks.

6. Institute Public Advisory Committees

National Heart, Lung, and Blood Advisory Council

Structure

Chair: Barbara M. Alving, M.D., Acting 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*

Barbara M. Alving, M.D.
Chair
National Heart, Lung, and Blood Institute

Rina Alcalay, Ph.D. (2003)
University of California, Davis

Melissa A. Austin, Ph.D. (2004)
University of Washington

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

Carolyne Sue Byrnes (2004)
LAM Foundation

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

Jeffrey M. Drazen, M.D. (2004)
New England Journal of Medicine

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

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

Mary F. Lipscomb, M.D. (2003)
University of New Mexico School of Medicine

Robert J. Mason, M.D. (2005)
University of Colorado

Alan Meisel, J.D. (2003)
University of Pittsburgh School of Law

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

Ngai X. Nguyen (2006)
San Jose, California

Ananda S. Prasad, M.D., Ph.D (2004)
Wayne State University

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

Pearl T. Toy, M.D. (2004)
University of California, San Francisco

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

Roberta G. Williams, M.D. (2003)
Children's Hospital of Los Angeles

Ex Officio Members

Arn H. Eliasson, M.D.
Walter Reed Army Medical Center

Robert C. Jesse, M.D.
McGuire Veterans Affairs Medical Center

Tommy G. Thompson
Department of Health and Human Services

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

* Current as of October 2003. 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: Charles M. Peterson, M.D., Director, 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*

Gilda A. Barabino, Ph.D. (2004)
Northeastern University

Oswaldo Castro, M.D. (2004)
Howard University

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

Paul S. Frenette, M.D. (2007)
Mount Sinai Medical Center

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

J. Hoxi Jones (2004)
Texas Department of Human Services

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

Joseph Telfair, Dr.P.H. (2004)
University of Alabama at Birmingham

Russell E. Ware, M.D. (2006)
Duke University Medical Center

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.
Brooke 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*

Gene D. Block, Ph.D. (2004)
University of Virginia

Sarah J. Caddick, Ph.D. (2004)
Wadsworth Foundation

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

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

* Current as of October 2003.

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

Clifford B. Saper, M.D., Ph.D. (2005)
Harvard Medical School

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

Lorraine L. Wearley, Ph.D. (2007)
Johnson & Johnson

Phillip L. Williams (2004)
Bethlehem Steel

Ex Officio Members

Barbara M. Alving, M.D.
NHLBI, National Institutes of Health

Colonel Gregory Belenky, M.D.
Walter Reed Army Institute of Research

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

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

Israel Lederhendler, Ph.D.
NIMH, National Institutes of Health

Andrew Monjan, Ph.D., M.P.H.
NIA, National Institutes of Health

Paul Nichols, Ph.D.
NINDS, National Institutes of Health

Eve E. Slater, M.D.
Department of Health and Human Services

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

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

Clinical Trials Review Committee

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

Scientific Review Administrator: Valerie L. Prenger, Ph.D., M.P.H., Health Science Administrator, Division of Extramural Affairs, NHLBI, National Institutes of Health, Bethesda, MD 20892; 301–435–0287

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

John M. Fontaine, M.D. (2005)
Hahnemann University

Judith S. Hochman, M.D. (2006)
Columbia University

Kenneth V. Leeper, M.D. (2004)
Emory University School of Medicine

Marilyn J. Manco-Johnson, M.D. (2005)
University of Colorado Health Sciences Center

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

* Current as of October 2003.

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

Linda G. Snetselaar, Ph.D. (2004)
University of Iowa

Charles M. Stein, M.D. (2004)
Vanderbilt University Medical Center

Marilyn J. Telen, M.D. (2005)
Duke University Medical Center

Carla Yunis, M.D. (2004)
3M Pharmaceuticals

Heart, Lung, and Blood Program Project Review Committee

Chair: Joe G. Garcia, M.D., The Johns Hopkins University

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*

Roberto Bolli, M.D. (2004)
University of Louisville School of Medicine

Martha K. Cathcart, Ph.D. (2004)
Cleveland Clinic Foundation

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

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

Katherine A. High, M.D. (2005)
University of Pennsylvania

Cheryl A. Hillery, M.D. (2005)
The Blood Center of Southeastern Wisconsin

Alan H. Kadish, M.D. (2004)
Northwestern University Medical School

K. J. Koa, M.D., Ph.D. (2005)
Synpac North Carolina

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

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

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

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

Nancy J. Rusch, Ph.D. (2004)
Medical College of Wisconsin

Roy L. Silverstein, M.D. (2006)
Cornell University

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

Kurt R. Stenmark, M.D. (2005)
University of Colorado Health Sciences Center

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

National Heart, Lung, and Blood Institute Special Emphasis Panel

The Institute has established the NHLBI Special Emphasis Panel (SEP) to perform initial peer review of applications and proposals that were previously handled by ad hoc committees. Concept review, previously handled by divisional program advisory committees, has also been incorporated into the SEP system. The SEP,

* Current as of October 2003.

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: Joseph Loscalzo, M.D., Ph.D., Boston University School of Medicine

Executive Secretary: Elizabeth Nabel, M.D., Director, Clinical Research Program, NHLBI, National Institutes of Health, Bethesda, MD 20892; 301–496–1518

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 Texas Southwestern Medical Center

Nancy Berliner, M.D. (2007)
Yale University

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

Pamela B. Davis, M.D. (2006)
Case Western Reserve University

Kevin J. Foskett, Ph.D. (2005)
University of Pennsylvania

Carole R. Mendelson, Ph.D. (2004)
University of Texas Southwestern Medical Center

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

Stephen G. Young, M.D. (2005)
University of California, San Francisco

* Current as of October 2003.

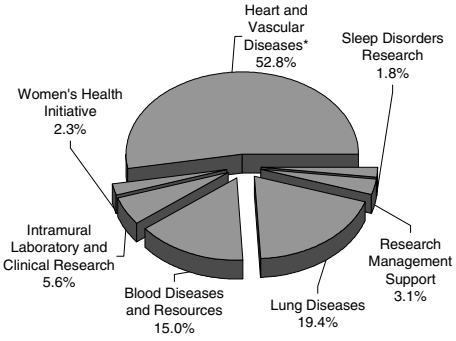
7. Fiscal Year 2003 Budget Overview

NHLBI Obligations by Funding Mechanism: Fiscal Year 2003

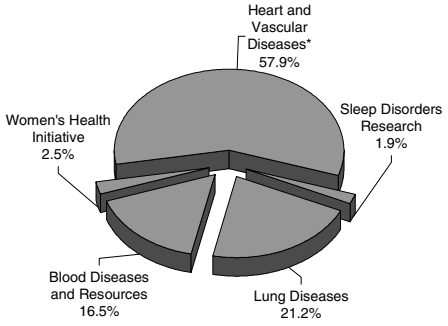
Funding Mechanism	Obligated Dollars* (Thousands)	Percent of Total NHLBI Budget
Research Project Grants†	$1,920,201	68.7%
SCORs/SCCORs	116,030	4.2
Sickle Cell Centers	20,605	0.7
Centers for AIDS Research	2,306	0.1
Other Research Grants	113,172	4.1
Research Careers Programs‡	*65,817*	*2.4*
Training Programs	85,785	3.1
Research and Development Contracts	290,474	10.4
Intramural Laboratory and Clinical Research	157,824	5.6
Research Management and Support§	87,284	3.1
Research Facilities Construction Grants	—	—
Total Obligations	**$2,793,681**	**100%**

* Excludes funds provided by other agencies by means of a reimbursable agreement.
† Includes $66,251 for Small Business Innovation Research (SBIR) Grants.
‡ 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.

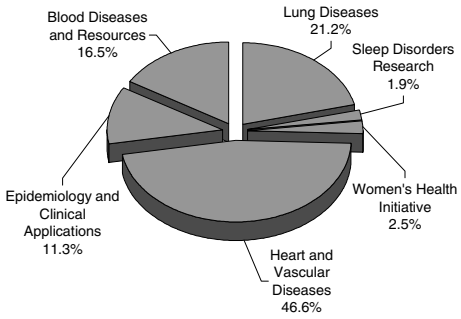
NHLBI Total Obligations by Budget Category



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 2003:

- 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 2003

Program	Obligated Dollars (Thousands)	Percent of NHLBI Extramural Budget
Heart and Vascular Diseases*	$1,475,592	57.9%
Lung Diseases	541,051	21.2
Blood Diseases and Resources	419,348	16.5
Sleep Disorders Research	49,360	1.9
Women's Health Initiative	63,222	2.5
Total, Extramural Obligations	**$2,548,573**	**100%**

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

NHLBI Heart and Vascular Diseases Program* Obligations by Funding Mechanism: Fiscal Year 2003

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	$ 939,183	79.0%
SCORs/SCCORs	44,761	3.8
Other Research Grants	36,767	3.1
Research Career Programs†	*22,715*	*1.9*
Training Programs	43,657	3.7
Research and Development Contracts	123,717	10.4
Total, Heart and Vascular Diseases	**$1,188,085**	**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 2003

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	$198,374	69.0%
SCORs/SCCORs	—	—
Other Research Grants	11,467	4.0
*Research Career Programs**	*8,396*	*2.9*
Training Programs	5,958	2.1
Research and Development Contracts	71,708	24.9
Total, Epidemiology and Clinical Applications	**$287,507**	**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 2003

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	$413,844	76.5%
SCORs/SCCORs	49,155	9.1
Other Research Grants	46,240	8.5
*Research Career Programs**	*22,332*	*4.1*
Training Programs	20,067	3.7
Research and Development Contracts	11,745	2.2
Total, Lung Diseases	**$541,051**	**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 2003

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	$329,069	78.5%
SCORs/SCCORs	15,904	3.8
Sickle Cell Centers	20,605	4.9
Centers for AIDS Research	2,306	0.5
Other Research Grants	17,124	4.1
*Research Career Programs**	*8,224*	*2.0*
Training Programs	14,258	3.4
Research and Development Contracts	20,082	4.8
Total, Blood Diseases and Resources Program	**$419,348**	**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 2003

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	$39,731	80.5%
SCORs/SCCORs	6,210	12.6
Other Research Grants	1,574	3.2
*Research Career Programs**	*1,574*	*3.2*
Training Programs	1,845	3.7
Research and Development Contracts	—	—
Total, Sleep Disorders Research	**$49,360**	**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 2003

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	63,222	100
Total, Women's Health Initiative	**$63,222**	**100%**

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

8. Long-Term Trends

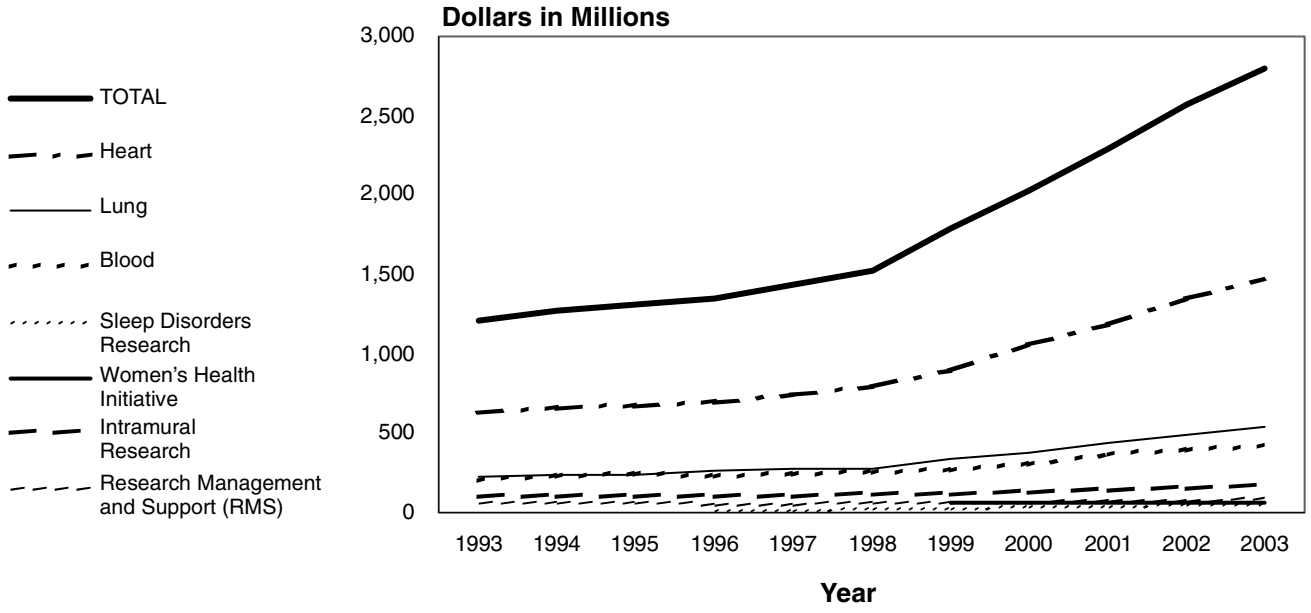
Budget History of the NHLBI: Fiscal Years 1950–2003

Dollars (Thousands)

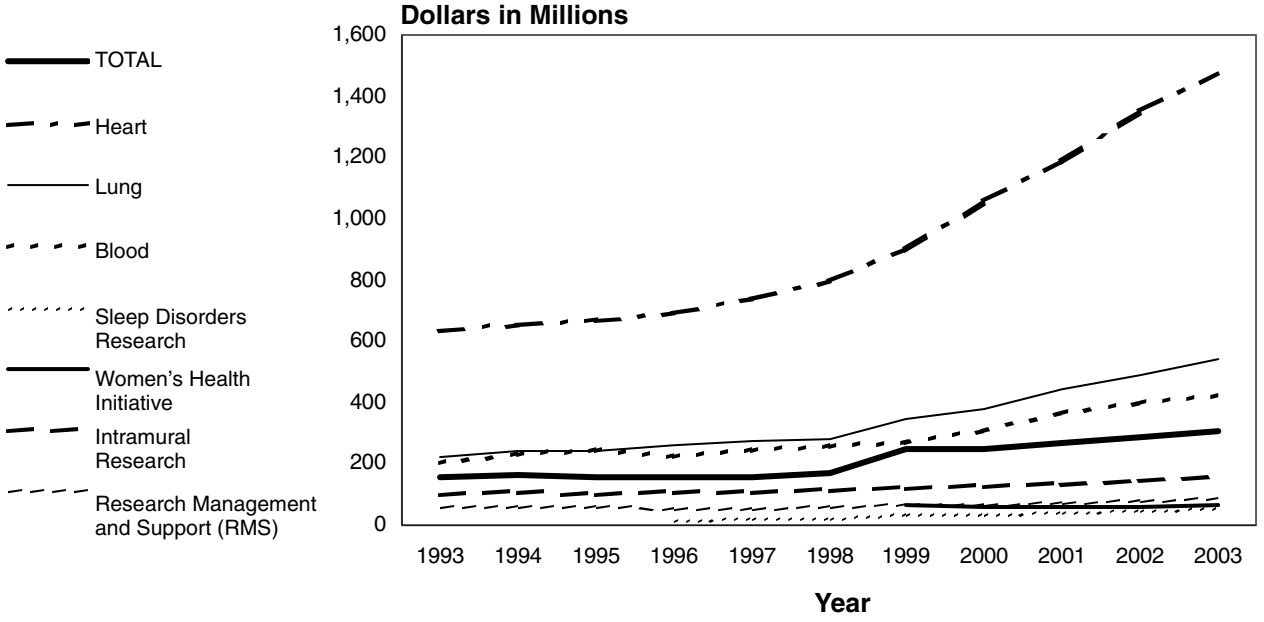
Fiscal Year	Budget Estimate to Congress	House Allowance	Senate Allowance	Appropriation	Obligations	Cumulative Fiscal Year Obligations
1950	$ 34,630	$ 11,575	$ 29,117	$ 16,075	$ 15,768	$ 15,768
1951	8,800	8,800	9,400	9,400	8,497	24,265
1952	10,237	10,074	10,156	10,083	9,850	34,115
1953	9,779	9,623	12,000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

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.

NHLBI Total Obligations by Budget Category: Fiscal Years 1993–2003
Current Dollars



NHLBI Total Obligations by Budget Category: Fiscal Years 1993–2003
Constant 1993 Dollars



NHLBI Total Obligations by Budget Category: Fiscal Years 1993–2003

Current Dollars (Millions)

	Fiscal Year										
Budget Category	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Extramural Research											
Heart	$ 632.0	$ 651.7	$ 668.9	$ 692.8	$ 737.9	$ 795.6	$ 898.0	$1,058.0	$1,186.6	$1,353.4	$1,475.6
Lung	221.6	238.7	243.0	261.9	273.4	281.7	346.2	380.4	444.0	490.5	541.1
Blood	203.5	227.4	244.6	224.3	242.7	257.5	266.1	305.9	364.0	396.0	419.3
Sleep Disorders Research	—	—	—	15.9	18.7	22.3	31.2	35.1	37.0	44.7	49.4
Women's Health Initiative	—	—	—	—	—	—	63.1	57.7	59.2	59.0	63.2
Intramural Research	98.2	101.7	98.9	101.8	104.4	111.6	119.5	122.3	133.7	146.7	157.8
Research Management and Support (RMS)	59.4	58.4	59.5	54.8	54.6	57.6	63.9	67.9	73.5	79.4	87.3
Total	**$1,214.7**	**$1,277.9**	**$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**

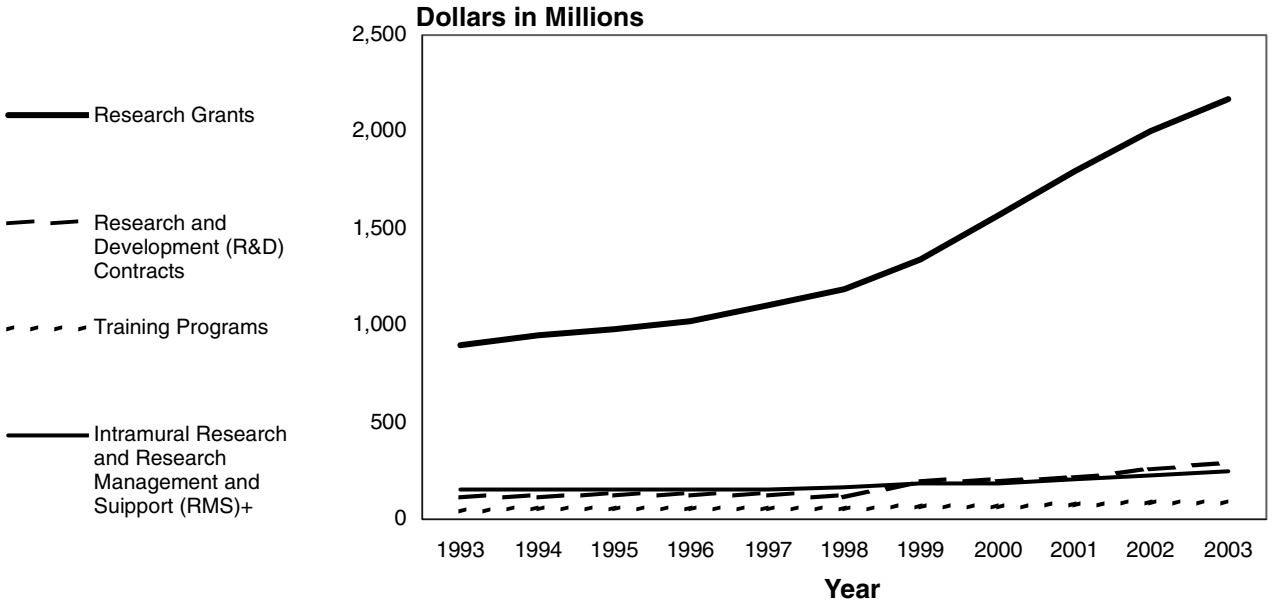
NHLBI Total Obligations by Budget Category: Fiscal Years 1993–2003

Constant 1993 Dollars (Millions)

	Fiscal Year										
Budget Category	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Extramural Research											
Heart	$ 632.0	$ 627.2	$ 622.2	$ 628.7	$ 651.3	$ 679.4	$ 739.1	$ 835.0	$ 898.9	$ 989.3	$1,045.8
Lung	221.6	229.7	226.0	237.7	241.3	240.6	284.9	300.2	336.4	358.6	383.5
Blood	203.5	218.9	227.5	203.5	214.2	219.9	219.0	241.4	275.8	289.5	297.2
Sleep Disorders Research	—	—	—	14.4	16.5	19.0	25.7	27.7	28.0	32.7	35.0
Women's Health Initiative	—	—	—	—	—	—	51.9	45.5	44.8	43.2	44.8
Intramural Research	98.2	97.9	92.0	92.4	92.1	95.3	98.4	96.5	101.3	107.2	111.8
Research Management and Support (RMS)	59.4	56.2	55.3	49.7	48.2	49.2	52.6	53.6	55.7	58.0	61.9
Total	**$1,214.7**	**$1,229.9**	**$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**

This table is based on the Biomedical Research & Development Price Index (January 2003).

NHLBI Total Obligations by Budget Mechanism: Fiscal Years 1993–2003



NHLBI Total Obligations by Budget Mechanism: Fiscal Years 1993–2003

Current Dollars (Millions)

	Fiscal Year										
Funding Mechanism	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Research Grants*	$ 895.3	$ 951.2	$ 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
Research and Development (R&D) Contracts	117.5	118.3	125.9	120.9	121.9	116.7	197.2	201.3	220.1	258.3	290.5
Training Programs	44.3	48.3	48.0	48.5	49.8	50.6	60.8	65.4	73.7	79.2	85.8
Intramural Research and Research Management and Support (RMS)†	157.6	160.1	158.4	156.6	159.1	169.2	183.4	190.1	207.3	226.1	245.1
Total	**$1,214.7**	**$1,277.9**	**$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**

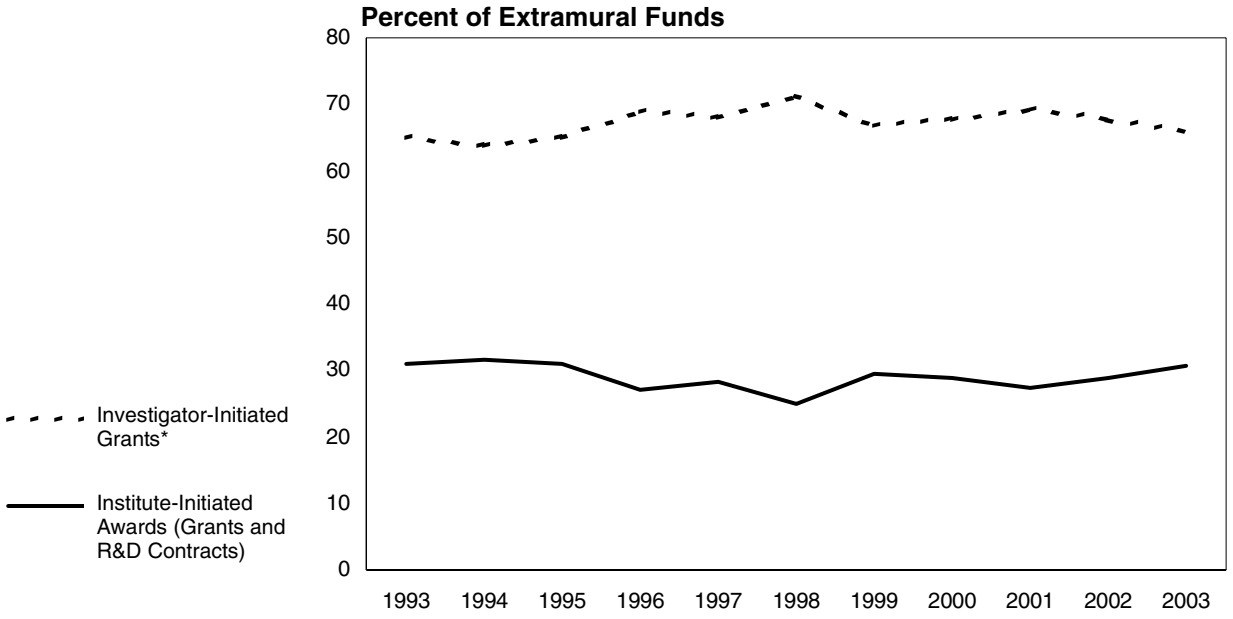
* Includes Research Career Programs.
† Excludes Office of the Director and DIR research contracts, which are included in R&D contracts.

NHLBI Employment: Fiscal Years 1993–2003

	Fiscal Year										
Staff	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
FTEs*	911	854	822	834	829	840	847	865	868	880	880

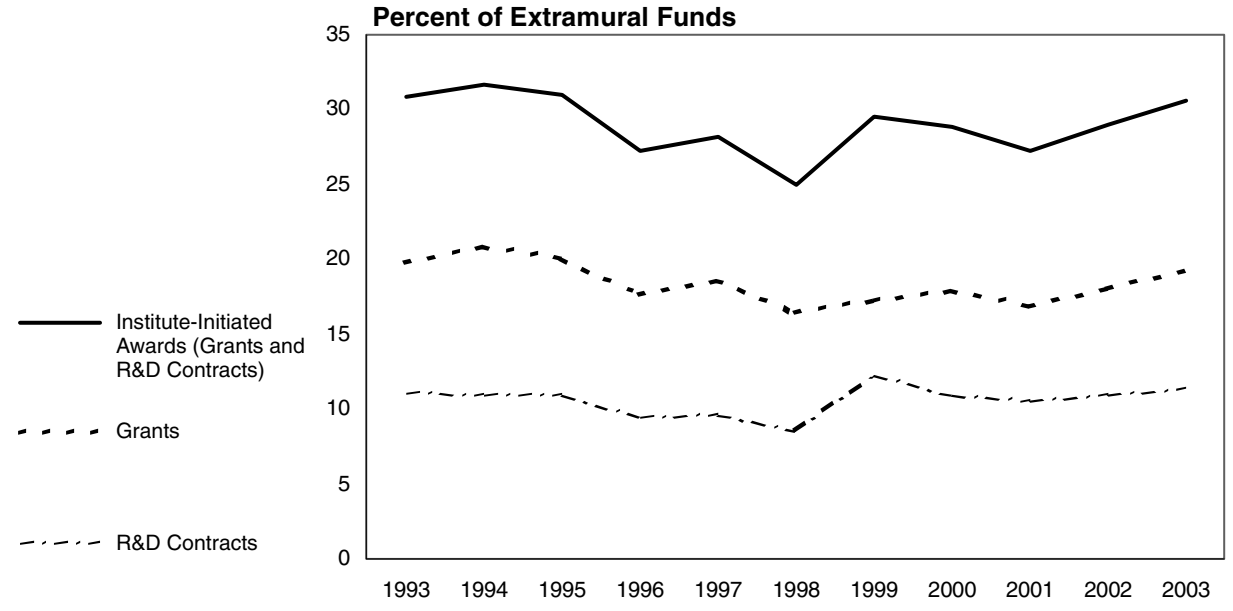
* Full-time equivalents.

NHLBI Institute-Initiated and Investigator-Initiated Awards: Fiscal Years 1993–2003



* Includes Research Career Programs.

NHLBI Grants and Research and Development Contracts as Subsets of Institute-Initiated Awards: Fiscal Years 1993–2003



NHLBI Extramural Programs: Fiscal Years 1993–2003

Dollars (Millions)

	Fiscal Year										
Funding Mechanism	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Investigator-Initiated Awards											
Investigator-Initiated Grants*	$ 663.2	$ 669.7	$ 725.0	$ 815.5	$ 835.3	$ 930.5	$1,023.6	$1,188.6	$1,388.8	$1,521.4	$1,616.1
Research Career Programs	23.1	25.1	25.7	28.9	28.9	36.1	46.3	53.0	57.5	63.5	65.8
Subtotal, Investigator-Initiated Awards	686.3	694.8	750.7	844.4	864.2	966.6	1,069.9	1,241.6	1,446.3	1,584.9	1,681.9
Institute-Initiated Awards											
Institute-Initiated Grants (RFA)	209.0	226.4	231.9	216.8	236.8	223.2	276.7	328.9	350.7	421.3	490.4
Centers†	*96.6*	*101.5*	*107.0*	*87.5*	*87.7*	*114.4*	*119.9*	*123.8*	*127.2*	*128.2*	*138.9*
R&D Contracts (RFP)	117.5	118.3	125.9	116.7	121.9	116.7	197.2	201.3	220.1	258.3	290.5
Subtotal, Institute-Initiated Awards	326.5	344.7	357.8	333.5	358.7	339.9	473.9	530.2	570.8	679.6	780.9
Training											
Individual Awards	6.2	7.2	7.1	7.3	6.8	7.6	9.2	8.9	8.9	9.5	8.6
Institutional Awards	37.2	40.0	40.0	40.2	42.0	42.0	50.3	55.2	63.4	69.7	75.5
Subtotal, Training‡	44.3	48.2	48.0	48.5	49.8	50.6	60.8	65.4	73.7	79.2	85.8
Total, Extramural	**$1,057.1**	**$1,087.7**	**$1,156.5**	**$1,226.4**	**$1,272.7**	**$1,357.1**	**$1,604.6**	**$1,837.2**	**$2,090.8**	**$2,343.7**	**$2,548.6**

* 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.

‡ Numbers do not add to subtotal because line-items exclude NIH assessments.

NHLBI Extramural Programs: Fiscal Years 1993–2003

Percent of Total Extramural Budget

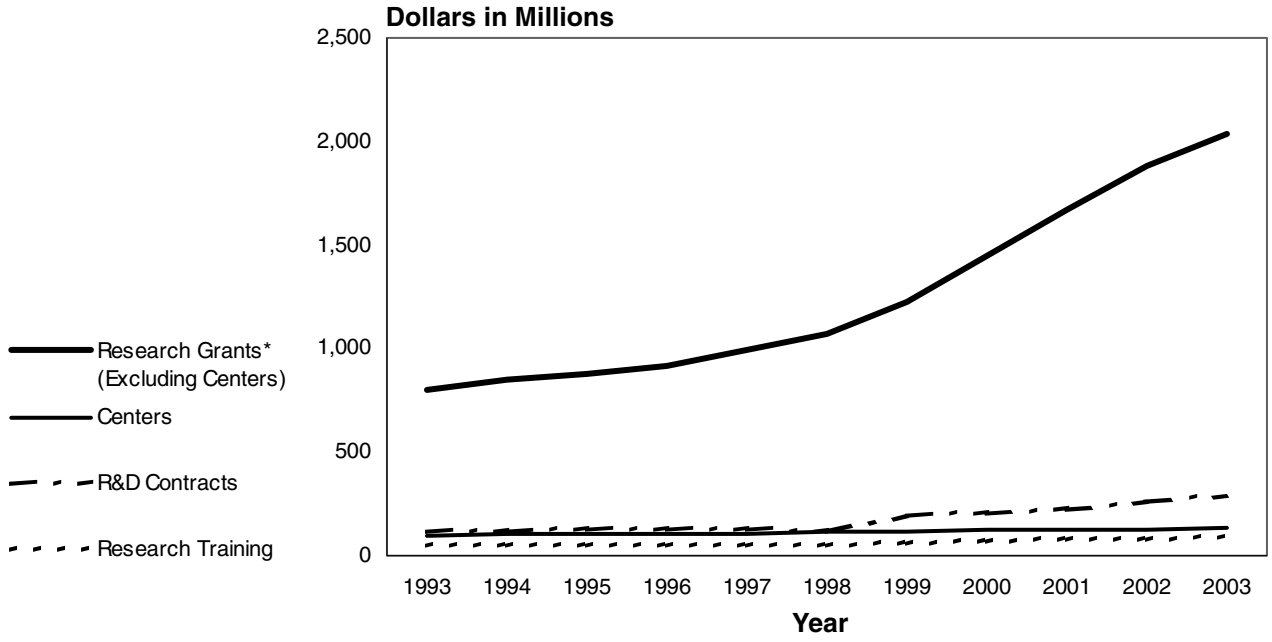
	Fiscal Year										
Funding Mechanism	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Investigator-Initiated Awards											
Investigator-Initiated Grants*	62.7%	61.6%	62.7%	66.5%	65.6%	68.6%	63.8%	64.7%	66.4%	64.9%	63.4%
Research Career Programs (K04, K06)	2.2	2.3	2.2	2.4	2.3	2.7	2.9	2.9	2.8	2.7	2.6
Subtotal, Investigator-Initiated Awards	64.9	63.9	64.9	68.9	67.9	71.2	66.7	67.6	69.2	67.6	66.0
Institute-Initiated Awards											
Institute-Initiated Grants (RFA)	19.8	20.8	20.1	17.7	18.6	16.4	17.2	17.9	16.8	18.0	19.2
Centers†	*9.1*	*9.3*	*9.3*	*7.1*	*6.9*	*8.4*	*7.5*	*6.7*	*6.1*	*5.5*	*5.5*
R&D Contracts (RFP)	11.1	10.9	10.9	9.5	9.6	8.6	12.3	11.0	10.5	11.0	11.4
Subtotal, Institute-Initiated Awards	30.9	31.7	30.9	27.2	28.2	25.0	29.5	28.9	27.3	29.0	30.6
Training											
Individual Awards	0.6	0.7	0.6	0.6	0.5	0.6	0.6	0.5	0.4	0.4	0.4
Institutional Awards	3.5	3.7	3.5	3.3	3.3	3.1	3.1	3.0	3.0	3.0	3.0
Subtotal, Training‡	4.2	4.4	4.2	4.0	3.9	3.7	3.8	3.6	3.5	3.4	3.4
Total, Extramural	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

* Includes all R18s.

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

‡ Numbers do not add to subtotal because line-items exclude NIH assessments.

NHLBI Extramural Research Funding Mechanism: Fiscal Years 1993–2003



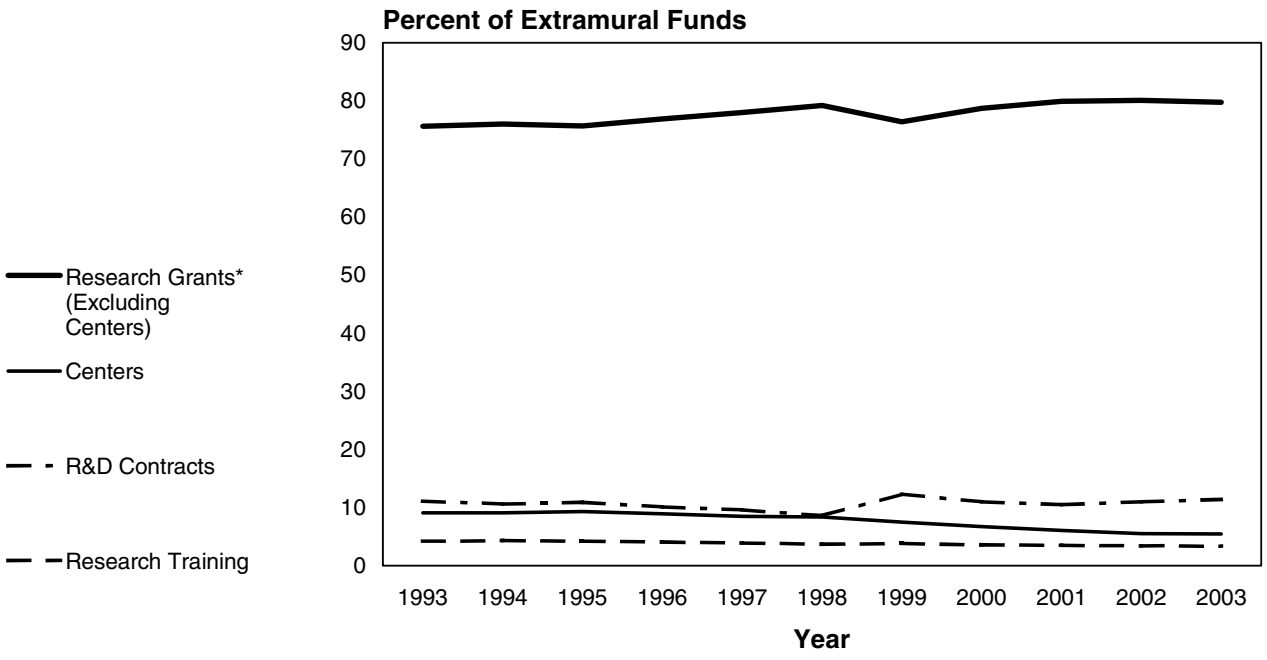
NHLBI Extramural Research Funding Mechanism: Fiscal Years 1993–2003

Dollars (Millions)

	Fiscal Year										
Funding Mechanism	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Research Grants*	$ 798.7	$ 849.7	$ 875.7	$ 918.7	$ 992.3	$1,075.4	$1,226.7	$1,446.7	$1,669.8	$1,878.0	$2,033.4
Centers	96.6	101.5	107.0	106.7	108.7	114.4	119.9	123.8	127.2	128.2	138.9
R&D Contracts	117.5	118.3	125.9	120.9	121.9	116.7	197.2	201.3	220.1	258.3	290.5
Research Training	44.3	48.2	48.0	48.5	49.8	50.6	60.8	65.4	73.7	79.2	85.8
Total, Extramural	**$1,057.1**	**$1,117.7**	**$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**

* Includes Research Career Programs; does not include Centers.

NHLBI Extramural Research Funding Mechanism: Fiscal Years 1993–2003



NHLBI Extramural Research Funding Mechanism: Fiscal Years 1993–2003

Percent of Total Extramural Budget

	Fiscal Year										
Funding Mechanism	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Research Grants*	75.6%	76.0%	75.7%	76.9%	78.0%	79.2%	76.4%	78.7%	79.9%	80.1%	79.8%
Centers	9.1	9.1	9.3	8.9	8.5	8.4	7.5	6.7	6.1	5.5	5.5
R&D Contracts	11.1	10.6	10.9	10.1	9.6	8.6	12.3	11.0	10.5	11.0	11.4
Research Training	4.2	4.3	4.2	4.1	3.9	3.7	3.8	3.6	3.5	3.4	3.4
Total, Extramural	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

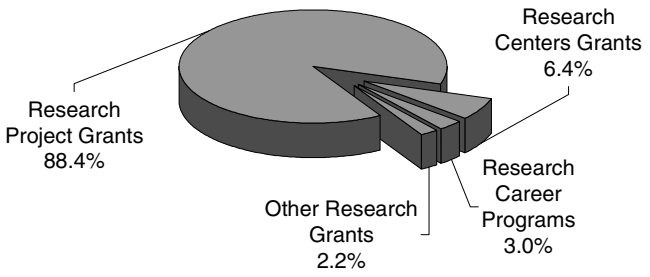
* Includes Research Career Programs; does not include Centers.
Note: Numbers may not add to total due to rounding.

9. Research Grants

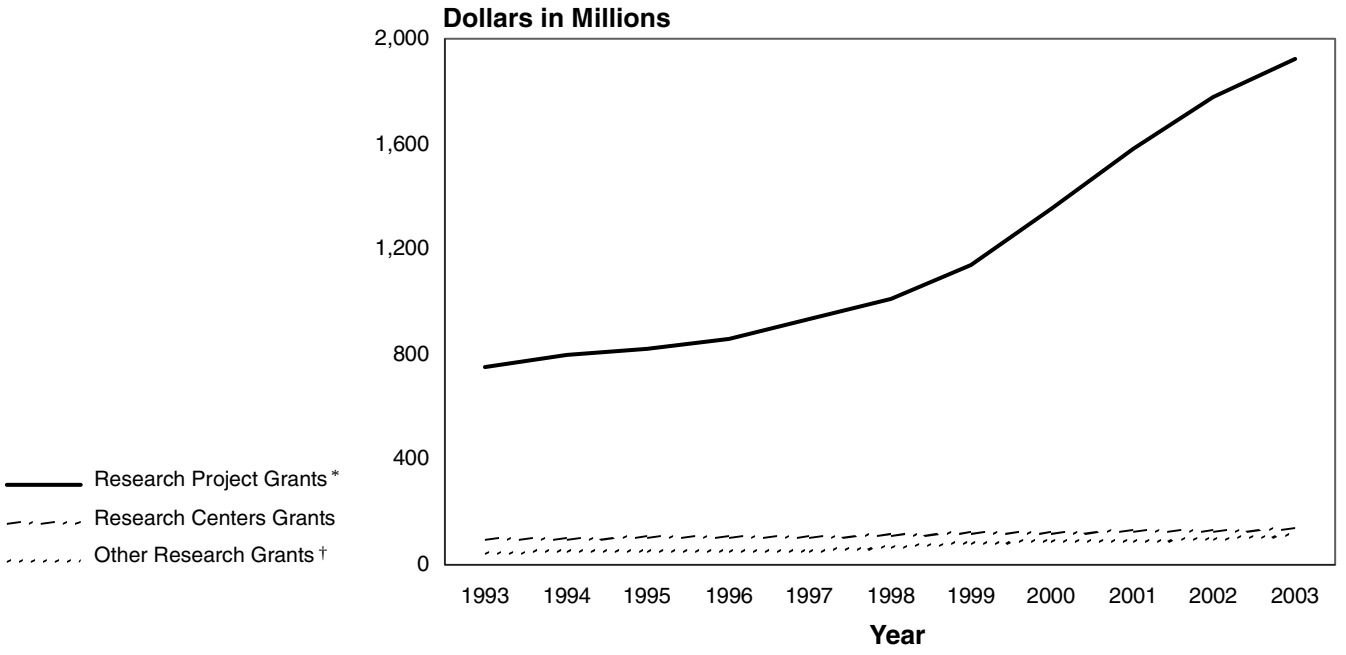
NHLBI Research Grants by Funding Mechanism: Fiscal Year 2003

	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)	3,583	$1,270,296	58.48%
Small Research Grants (R03)	4	344	0.02
Program Project Grants (P01)	191	339,371	15.62
Cooperative Agreements (U01)	253	198,248	9.13
Area Grants (R15)	21	2,963	0.14
Explorative Developmental Grant (R21)	50	10,572	0.49
Method to Extend Research in Time (R37)	81	30,900	1.42
Exploratory/Developmental Grants Phase II (R33)	4	1,256	0.06
Subtotal, Research Project Grants (Excluding Small Business RPGs)	4,187	1,853,950	85.34
Small Business Research Project Grants			
Small Business Technology Transfer (STTR Phase I) (R41)	11	1,400	0.06
Small Business Technology Transfer (STTR Phase II) (R42)	7	2,438	0.11
Small Business Innovation Research (SBIR Phase I) (R43)	104	13,062	0.60
Small Business Innovation Research (SBIR Phase II) (R44)	117	49,351	2.27
Subtotal, Small Business Research Project Grants	239	66,251	3.05
Subtotal, Research Project Grants	4,426	1,920,201	88.39
Research Center Grants			
Exploratory Grants (P20)	2	1,561	0.07
Specialized Centers of Research (SCOR)	65	114,044	5.25
Animal Model and Animal and Biological Material Resource Grants (P40)	—	425	0.02
Sickle Cell Centers (U54)	10	20,605	0.95
Center for AIDS Research (P30)	—	2,306	0.11
Subtotal, Research Center Grants	77	138,941	6.40
Research Career Programs			
Mentored Research Development Award for Minority Faculty (K01)	49	6,411	0.30
Minority Institution Faculty Mentored Research Scientist Award (K01)	7	991	0.05
Independent Scientist Award (K02)	32	3,099	0.14
Research Career Award (K06)	2	69	0.00
Nutrition Academic Award (K07)	9	1,472	0.07
Clinical Investigator Scientist Award (K08)	240	30,288	1.39
Career Enhancement Award for Stem Cell Research (K18)	1	243	0.01
Mentored Patient-Oriented Research Career Development Award (K23)	110	14,571	0.67
Midcareer Investigator Award in Patient-Oriented Research (K24)	38	4,368	0.20
Mentored Quantitative Research Career Development Award (K25)	9	1,195	0.06
Clinical Research Curriculum Award (K30)	55	3,110	0.14
Subtotal, Research Career Programs	552	65,817	3.03
Other Research Grants			
Cooperative Clinical Research (U10, R10)	24	21,772	1.00
Minority Biomedical Research Support (S06, S14, R25)	—	3,600	0.17
Biomedical Research Support (S07)	—	3,171	0.15
Other (R09, R13, R18, R24, R25, T15, U09, U24, UH1)	53	18,812	0.87
Subtotal, Other Research Grants	77	47,355	2.18
Total, NHLBI Research Grants	**5,132**	**$2,172,314**	**100%**

NHLBI Total Research Grants by Category



NHLBI Research Project Grant,* Research Centers Grant, and Other Research Grant Obligations: Fiscal Years 1993–2003



NHLBI Research Project Grant,* Research Centers Grant, and Other Research Grant Obligations: Fiscal Years 1993–2003

Dollars (Thousands)

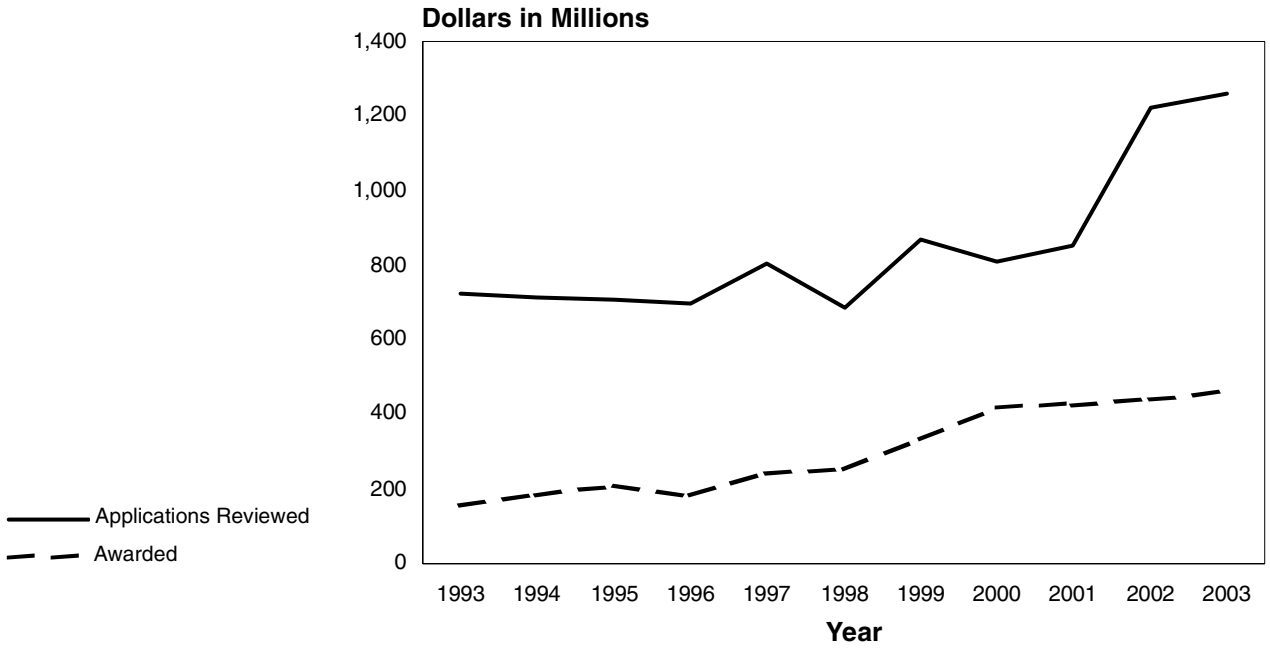
	Fiscal Year										
	1993	**1994**	**1995**	**1996†**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Research Project Grants*	$752,978	$797,092	$819,674	$ 862,027	$ 935,322	$1,009,152	$1,142,473	$1,356,034	$1,580,751	$1,779,573	$1,920,201
Research Centers Grants	96,628	101,535	106,980	106,688	108,665	114,397	119,889	123,803	127,232	128,161	138,941
Other Research Grants‡	45,654	52,576	55,974	56,692	56,993	66,234	84,219	90,666	88,958	98,460	113,172
Total	**$895,260**	**$951,203**	**$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**

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

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

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

NHLBI Competing Research Project Grant Applications*: Fiscal Years 1993–2003
Total Cost Dollars Reviewed and Awarded



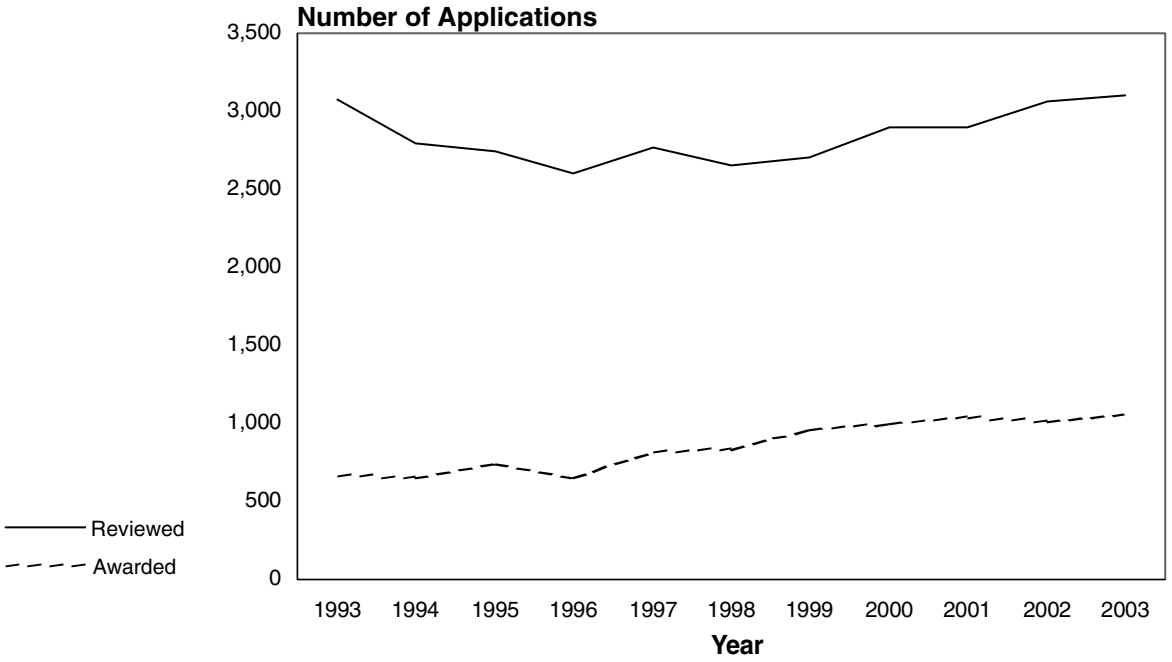
NHLBI Competing Research Project Grant Applications*: Fiscal Years 1993–2003
Total Cost Dollars Reviewed and Awarded

	Dollars (Millions)										
	Fiscal Year										
	1993	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Applications Reviewed	$724.3	$715.0	$710.3	$699.2	$802.1	$687.1	$867.1	$809.8	$851.7	$1,221.7	$1,262.5
Awarded	158.0	180.4	207.5	182.1	240.1	252.4	330.4	418.4	424.3	437.4	463.7

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

NHLBI Competing Research Project Grant Applications*: Fiscal Years 1993–2003

Number Reviewed and Awarded

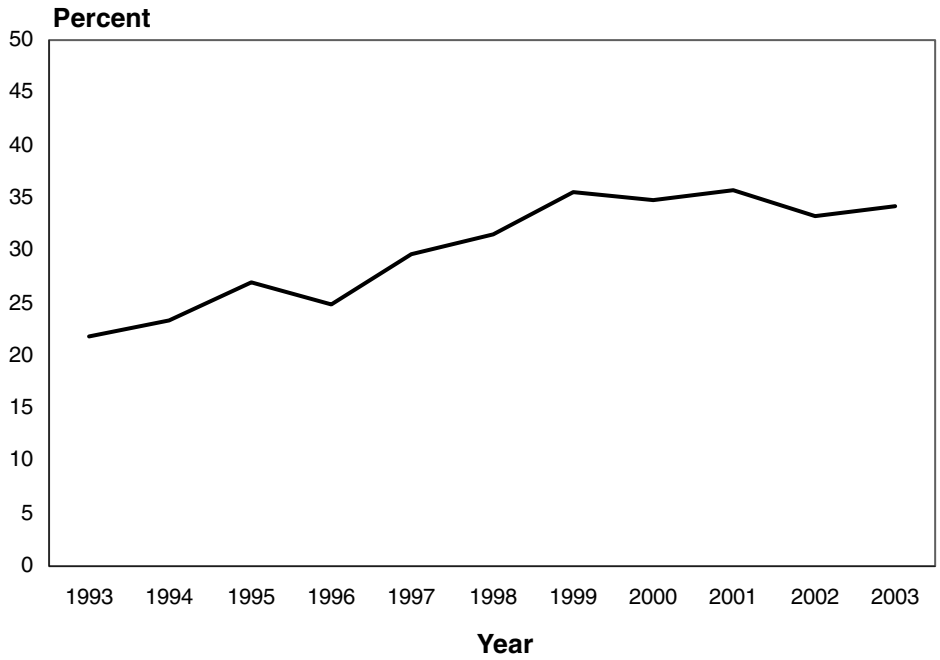


Number Reviewed and Awarded and Percent Funded

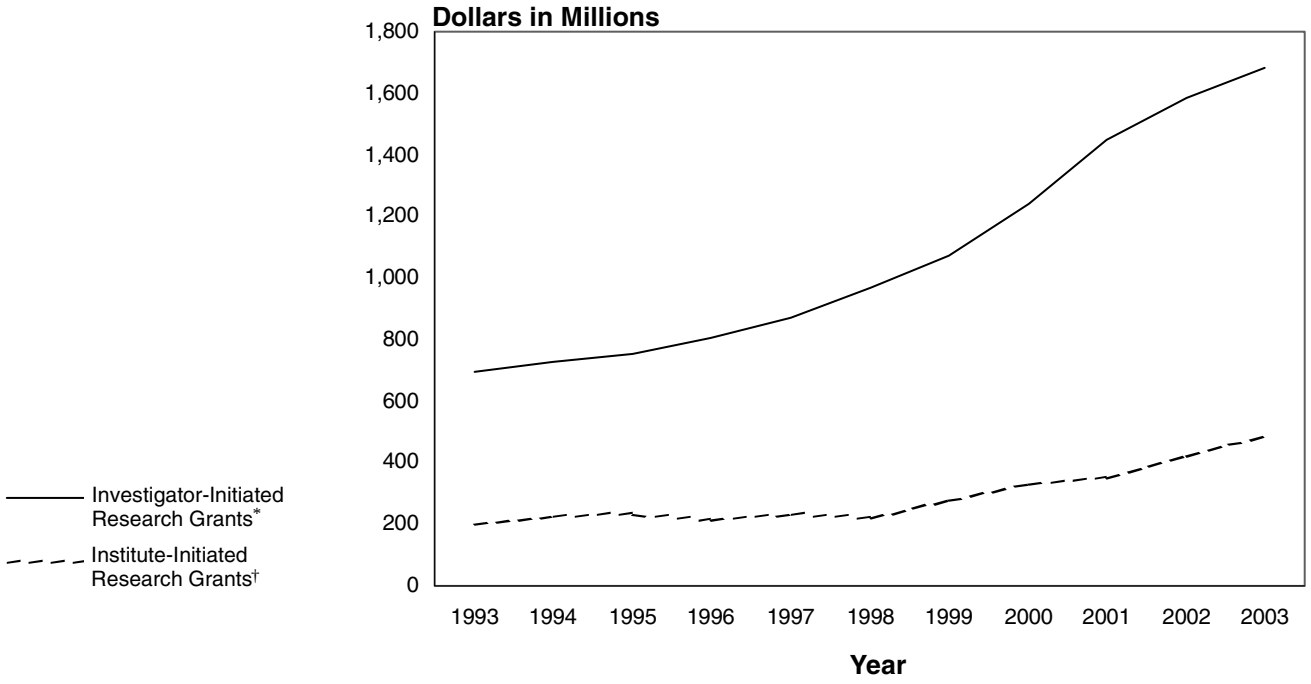
	Fiscal Year										
	1993	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Applications Reviewed	3,072	2,801	2,744	2,605	2,771	2,657	2,704	2,893	2,895	3,064	3,098
RPGs Awarded	673	655	740	652	821	837	959	1,003	1,033	1,018	1,064
Success Rate (percent)	21.9	23.4	27.0	25.0	29.6	31.5	35.5	34.7	35.7	33.2	34.3

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

Percent of Reviewed Applications Funded (Success Rate)



NHLBI Investigator-Initiated and Institute-Initiated Grant Obligations: Fiscal Years 1993–2003



NHLBI Investigator-Initiated and Institute-Initiated Grant Obligations: Fiscal Years 1993–2003

Dollars (Millions)

	Fiscal Year										
	1993	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Investigator-Initiated*	$692.8	$724.8	$750.7	$ 804.1	$ 867.9	$ 966.6	$1,069.9	$1,241.6	$1,446.2	$1,584.9	$1,681.9
Institute-Initiated†	202.5	226.4	231.9	216.8	233.0	223.2	276.7	328.9	350.7	421.3	490.4
Total	**$895.3**	**$951.2**	**$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**

* Includes R01, U01, P01, R29, R37, R43, and R44; R03 and R41 beginning in 1994; 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 1993–2003

Dollars (Millions)

	Fiscal Year										
	1993	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Competing											
New Competing	$ 89.9	$ 99.7	$111.1	$ 90.5	$135.8	$147.5	$ 202.0	$ 266.4	$ 280.0	$ 291.2	$285.5
Renewal Competing	79.1	79.6	94.5	90.4	104.0	103.9	127.2	152.0	143.9	143.9	177.2
Competing Supplements	0.6	1.1	1.9	1.2	0.3	1.0	1.2	0.9	0.4	2.3	1.0
Subtotal, Competing	169.6	180.4	207.5	182.1	240.1	252.4	330.4	419.3	424.3	437.4	463.7
Noncompeting											
Subtotal, Noncompeting	583.4	599.9	588.4	649.9	662.4	721.3	770.6	889.3	1,101.5	1,281.3	1,390.3
Total, Competing and Noncompeting	**$753.0**	**$780.3**	**$795.9**	**$832.0**	**$902.5**	**$973.7**	**$1,101.0**	**$1,308.6**	**$1,525.8**	**$1,718.7**	**$1,854.0**

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

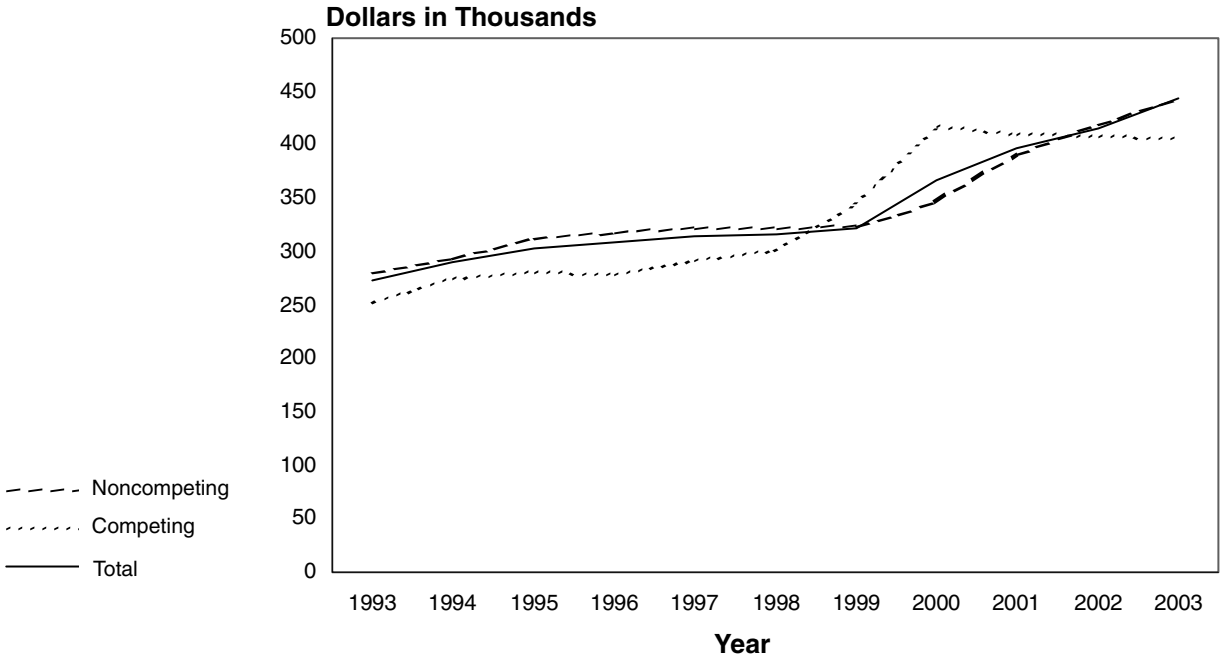
Facility and Administrative (F&A)* Costs of NHLBI Research Project Grants†: Fiscal Years 1993–2003

Dollars (Thousands)

Fiscal Year	Direct Cost	F&A Cost†	Total Cost	F&A Cost as a Percent of Direct Cost
1993	$ 516,022	$ 236,956	$ 752,978	45.9%
1994	534,374	245,965	780,339	46.0
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

* Previously called Indirect Cost.
† Includes R01, U01, P01, R29, and R37; R03 beginning in 1994; 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 1993–2003



NHLBI Research Project Grants*: Average Costs, Fiscal Years 1993–2003

Dollars (Thousands)

	Fiscal Year										
	1993	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Noncompeting	$281.0	$294.8	$312.8	$317.5	$323.0	$322.6	$323.4	$346.6	$390.7	$418.8	$444.4
Competing	252.0	275.5	280.4	279.3	292.5	301.6	344.5	418.0	410.8	409.1	406.7
Total	**$273.9**	**$290.1**	**$303.7**	**$308.3**	**$314.2**	**$316.9**	**$329.4**	**$366.6**	**$396.1**	**$416.2**	**$433.8**

* Includes R01, U01, P01, R29, R37, R43, and R44; R03 and R41 beginning in 1994; 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 2003	Total FY 2003 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
A CHF Trial Investigating Outcomes of Exercise (ACTION)	$ 7,489,394	$ 9,581,688	$ 17,071,082
Azithromycin and Coronary Events Study (ACES)	7,666,911	1,137,313	8,804,224
Bypass Angioplasty Revascularization Investigation in Type 2 Diabetics (BARI 2D)	19,099,816	8,189,120	27,288,936
Center for Fetal Monkey Gene Transfer for Heart, Lung, and Blood Diseases	1,235,343	621,819	1,857,162
Dietary Macronutrients and Weight Loss	—	1,211,724	1,211,724
Dynamic Evaluation of Percutaneous Coronary Intervention	3,197,140	774,582	3,971,722
Family Blood Pressure Program	67,501,440	8,903,639	76,405,079
Family Heart Study—Subclinical Atherosclerosis Network (FHS-SCAN)	6,692,242	2,172,221	8,864,463
Genetics of Coronary Artery Disease in Alaskan Natives (GOCADAN)	5,555,375	1,663,435	7,218,810
Girls Health Enrichment Multisite Studies (GEMS)	10,237,057	2,461,487	12,698,544
Hematocrit Strategy in Infant Heart Surgery	1,626,224	589,621	2,215,845
Home Automatic External Defibrillator Trial (HAT)	3,566,730	5,433,157	8,999,887
Interaction of Genes and Environment in Shaping Risk Factors for Heart, Lung, Blood, and Sleep Disorders	10,727,651	14,388,563	25,116,214
Multidisciplinary Study of Right Ventricular Dysplasia	3,345,345	1,433,590	4,778,935
Occluded Artery Trial (OAT)	14,298,450	1,963,003	16,261,453
Pediatric Cardiovascular Clinical Research Network	8,269,577	5,380,652	13,650,229
Pharmacogenetics Research Network	16,680,369	8,340,917	25,021,286
Programs of Excellence in Gene Therapy	37,097,010	12,063,952	49,160,962
Programs of Genomic Applications (PGAs) for Heart, Lung, and Blood Diseases	110,366,659	36,811,188	147,177,847
Stop Atherosclerosis in Native Diabetics Study (SANDS)	2,409,835	2,164,849	4,574,684
Strong Heart Study	38,855,307	4,428,138	43,283,445
Sudden Cardiac Death in Heart Failure Trial (SCD-HeFT)	9,855,175	1,929,664	11,784,839
Surgical Treatment for Ischemic Heart Failure (STICH)	5,709,397	6,542,012	12,251,409
Trial of Activity for Adolescent Girls (TAAG)	16,024,722	5,828,313	21,853,035
Weight Loss Maintenance (WLM)	—	3,686,738	3,686,738
Women's Ischemia Syndrome Evaluation (WISE)	3,008,819	1,306,092	4,314,911
Subtotal, Heart and Vascular Diseases	410,515,988	149,007,477	559,523,465
Lung Diseases			
Asthma Clinical Research Network (ACRN), Phase II	—	8,181,429	8,181,429
Centers for Reducing Asthma Disparities	5,933,220	6,118,604	12,051,824
Childhood Asthma Management Program–Continuation Study (CAMP–CS)/Phase 2	—	1,489,491	1,489,491
Childhood Asthma Research and Education (CARE) Network	20,496,205	5,609,827	26,106,032
Collaborative Programs in Bronchopulmonary Dysplasia	16,233,278	4,912,409	21,145,687
COPD Clinical Research Network	—	6,843,405	6,843,405
Inhaled Nitric Oxide for the Prevention of Chronic Lung Disease	5,526,692	1,441,567	6,968,259
Inhaled Nitric Oxide in Prevention of Chronic Lung Disease	5,128,526	1,604,333	6,732,859
Linkage Study in Familial Pulmonary Fibrosis	2,047,291	708,660	2,755,951
Pharmacogenetics of Asthma Treatment	8,007,228	2,840,148	10,847,376
Prospective Investigation of Pulmonary Embolism Diagnosis-II (PIOPED II)	9,028,494	471,625	9,500,119
Sarcoidosis Genetic Linkage Consortium	7,094,662	833,103	7,927,765
Scleroderma Lung Study	5,802,482	1,054,741	6,857,223
Subtotal, Lung Diseases	85,298,078	42,109,342	127,407,420

	Total Obligations Prior to FY 2003	Total FY 2003 Obligations	Total Obligations to Date
Blood Diseases and Resources			
Blood and Marrow Transplant Clinical Research Network	$ 11,259,414	$ 5,949,873	$ 17,209,287
Induction of Stable Chimerism for Sickle Cell Anemia	1,014,151	526,886	1,541,037
Reference Laboratory to Evaluate Therapies for Sickle Cell Disease	927,748	509,405	1,437,153
Sibling Donor Cord Blood Banking and Transplantation	2,445,687	1,285,569	3,731,256
Stroke Prevention in Sickle Cell Anemia (STOP 2)	10,827,025	2,320,327	13,147,352
Thalassemia (Cooley's Anemia) Clinical Research Network	6,679,892	2,319,991	8,999,883
Transfusion Medicine/Hemostasis Clinical Research Network	6,052,717	6,240,913	12,293,630
Subtotal, Blood Diseases and Resources	39,206,634	19,152,964	58,359,598
National Center on Sleep Disorders Research			
Apnea Positive Pressure Long-Term Efficacy Study (APPLES)	3,223,476	3,020,963	6,244,439
Sleep Heart Health Study	14,304,831	2,326,850	16,631,681
Subtotal, National Center on Sleep Disorders Research	17,528,307	5,347,813	22,876,120
Total, NHLBI Cooperative Agreements	**$552,549,007**	**$215,617,596**	**$768,166,603**

Heart and Vascular Diseases Program

A CHF Trial Investigating Outcomes of Exercise (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. The secondary objective is to determine the incidence and significance of exercise-related complications, the effect of training on exercise tolerance and quality of life, and the cost-effectiveness of training.

Obligations

Funding History:
Fiscal Year 2003—$9,581,688
Fiscal Year 2002—$7,489,394
Total Funding to Date—$17,071,082

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-068990

Azithromycin and Coronary Events Study (ACES), Initiated in Fiscal Year 1998

The purpose of this study is to determine whether treatment with the antibiotic, azithromycin, for 1 year will reduce the rate of nonfatal MI and CHD deaths over 3½ years in patients with documented coronary artery disease and serologic evidence of past infection with *Chlamydia pneumoniae*.

Obligations

Funding History:
Fiscal Year 2003—$1,137,313
Fiscal Years 1998–2002—$7,666,911
Total Funding to Date—$8,804,224

Current Active Organization and Grant Number

1. University of Washington
   Seattle, Washington —HL-058706

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

The objectives of this study are to determine in patients with Type 2 diabetes mellitus and coronary artery disease (1) whether early elective revascularization (angioplasty or CABG, as clinically indicated) improves survival compared to a more conservative approach—revascularization performed only when medically necessary and (2) whether glycemic control achieved by decreasing insulin resistance improves survival compared to glycemic control achieved by increasing insulin levels; 34 participants are from minority populations.

Obligations

Funding History:
Fiscal Year 2003—$8,189,120
Fiscal Years 2000–2002—$19,099,816
Total Funding to Date—$27,288,936

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

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 2003—$621,819
Fiscal Years 2001–2003—$1,235,343
Total Funding to Date—$1,857,162

Current Active Organization and Grant Number

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

Dietary Macronutrients and Weight Loss, 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 (35 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 2003—$1,211,724
Total Funding to date—$1,211,724

Current Active Organization and Grant Number

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

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 2003—$774,582
Fiscal Years 1997–2002—$3,197,140
Total Funding to Date—$3,971,722

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 2003—$8,903,639
Fiscal Years 1995–2002—$67,501,440
Total Funding to Date—$76,405,079

Current Active Organizations and Grant Numbers

1. University of Michigan
   Ann Arbor, Michigan —HL-054457
2. University of Mississippi
   Medical Center
   Jackson, Mississippi —HL-054463
3. Mayo Foundation
   Rochester, Minnesota —HL-054464
4. The Johns Hopkins University
   Baltimore, Maryland —HL-054466
5. University of Utah
   Salt Lake City, Utah —HL-054471
6. University of Minnesota, Twin Cities
   Minneapolis, Minnesota —HL-054472
7. Washington University
   St. Louis, Missouri —HL-054473
8. University of Texas
   Health Science Center
   Houston, Texas —HL-054481

9. Loyola University Medical Center
Maywood, Illinois —HL-054485
10. University of Alabama at Birmingham
Birmingham, Alabama —HL-054495
11. University of Minnesota, Twin Cities
Minneapolis, Minnesota —HL-054496
12. Boston University
Boston, Massachusetts —HL-054497
13. Staub Pacific Health Foundation
Health Research Institute
Honolulu, Hawaii —HL-054498
14. University of Texas
Health Science Center
Houston, Texas —HL-054504
15. Medical College of Wisconsin
Milwaukee, Wisconsin —HL-054508
16. University of North Carolina
at Chapel Hill
Chapel Hill, North Carolina —HL-054509
17. University of Michigan
Ann Arbor, Michigan —HL-054512
18. University of Pittsburgh
Pittsburgh, Pennsylvania —HL-054526
19. Stanford University
Stanford, California —HL-054527
20. University of California, San Diego
La Jolla, California —HL-064777

Family Heart Study—Subclinical Atherosclerosis Network (FHS-SCAN),* Initiated in Fiscal Year 2001

The purpose of this program is to examine vascular calcification and inflammation in patients who have previously been examined and extensively genotyped by the NHLBI Family Heart Study, in order to identify genetic factors influencing susceptibility to coronary and aortic atherosclerosis and individual variability in the inflammatory response. The study includes approximately 600 blacks.

Obligations

Funding History:
Fiscal Year 2003—$2,172,221
Fiscal Years 2001–2002—$6,692,242
Total Funding to Date—$8,864,463

Current Active Organizations and Grant Numbers

1. University of North Carolina
at Chapel Hill
Chapel Hill, North Carolina —HL-067893
2. University of Utah
Salt Lake City, Utah —HL-067894
3. Wake Forest University
Winston-Salem, North Carolina —HL-067895
4. Boston University
Boston, Massachusetts —HL-067896
5. Wake Forest University
Winston-Salem, North Carolina —HL-067897
6. University of Alabama at Birmingham
Birmingham, Alabama —HL-067898
7. Washington University
St. Louis, Missouri —HL-067899
8. University of Minnesota, Twin Cities
Minneapolis, Minnesota —HL-067900
9. University of Minnesota, Twin Cities
Minneapolis, Minnesota —HL-067901
10. University of Texas
Health Science Center
Houston, Texas —HL-067902

Genetics of Coronary Artery Disease in Alaskan 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 (1,200 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 2003—$1,663,435
Fiscal Years 2000–2002—$5,555,375
Total Funding to Date—$7,218,810

Current Active Organization and Grant Number

1. MedStar Research Institute
Washington, DC —HL-064244

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

See Chapter 11. Clinical Trials.

Hematocrit Strategy in Infant Heart Surgery, Initiated in Fiscal Year 2000

The purpose of this study is to determine which hematocrit level—30 versus 20 percent—provides the optimal degree of hemodilution during infant open heart surgery to repair congenital heart defects. Scientists will compare the effects of the two hematocrit levels with

* Formerly called Genetics of Coronary and Aortic Calcification (GENCAC).

respect to cardiovascular and neurodevelopmental outcomes in the infants during the immediate postoperative period and at 1 year of age.

Obligations

Funding History:
Fiscal Year 2003—$589,621
Fiscal Years 2000–2002—$1,626,224
Total Funding to Date—$2,215,845

Current Active Organization and Grant Number

1. Children's Hospital, Boston
Boston, Massachusetts —HL-063411

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

The purpose of this trial is to compare standard response (call 911 and give cardiopulmonary resuscitation) to sudden cardiac arrest to standard response augmented with automatic external defibrillator use provided by spouses or other family members in 7,000 survivors of an anterior wall MI. The primary end-point is mortality.

Obligations

Funding History:
Fiscal Year 2003—$5,433,157
Fiscal Year 2002—$3,566,730
Total Funding to Date—$8,999,887

Current Active Organization and Grant Number

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

Interaction of Genes and Environment in Shaping Risk Factors for Heart, Lung, Blood, 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, blood, 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 genotype who are most likely to benefit from targeted environmental changes designed to reduce the development or progression of heart, lung, blood, or sleep diseases.

Obligations

Funding History:
Fiscal Year 2003—$14,388,563
Fiscal Year 2002—$10,727,651
Total Funding to Date—$25,116,214

Current Active Organizations and Grant Numbers

1. Tulane University
New Orleans, Louisiana —HL-072507
2. LSU Pennington Biomedical Research Center
Baton Rouge, Louisiana —HL-072510
3. University of Maryland Baltimore Professional School
Baltimore, Maryland —HL-072525
4. The Johns Hopkins University
Baltimore, Maryland —HL-072518
5. University of Minnesota, Twin Cities
Minneapolis, Minnesota —HL-072524

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 2003—$1,433,590
Fiscal Year 2001–2002—$3,345,345
Total Funding to Date—$4,778,935

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-065961

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

The objective of this study is to determine whether percutaneous revascularization to open an occluded artery within a few days or as long as a month following an acute MI in asymptomatic patients improves their out-

come. While the benefits of early restoration of blood flow following an acute MI have been well established, it is not known whether later intervention is also beneficial.

Obligations

Funding History:
Fiscal Year 2003—$1,963,003
Fiscal Years 1999–2002—$14,298,450
Total Funding to Date—$16,261,453

Current Active Organizations and Grant Numbers

1. Duke University
   Durham, North Carolina —HL-062257
2. St. Luke's-Roosevelt Institute for Health Science
   New York, New York —HL-062509
3. Maryland Medical Research Institute
   Baltimore, Maryland —HL-062511

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 2003—$8,340,917
Fiscal Years 2001–2002—$16,680,369
Total Funding to Date—$25,021,286

Current Active Organizations and Grant Numbers

1. Brigham and Women's Hospital
   Boston, Massachusetts —HL-065899
2. Vanderbilt University
   Nashville, Tennessee —HL-065962
3. University of California, Berkeley
   Lawrence Berkeley National Laboratory
   Berkeley, California —HL-069757
4. University of California, San Diego
   La Jolla, California —HL-069758

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 2003—$12,063,952
Fiscal Years 2000–2002—$37,097,010
Total Funding to Date—$49,160,962

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 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. 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 2003—$36,811,188
Fiscal Years 2000–2002—$110,366,659
Total Funding to Date—$147,177,847

Current Active Organizations and Grant Numbers

1. Medical College of Wisconsin
   Milwaukee, Wisconsin —HL-066579
2. Institute for Genomic Research
   Rockville, Maryland —HL-066580
3. Harvard University School of Medicine
   Boston, Massachusetts —HL-066582
4. The Johns Hopkins University
   Baltimore, Maryland —HL-066583
5. University of Pennsylvania
   Philadelphia, Pennsylvania —HL-066588
6. University of California, Berkeley
   Berkeley, California —HL-066590
7. University of California, San Francisco
   San Francisco, California —HL-066600
8. Duke University
   Durham, North Carolina —HL-066604
9. Jackson Laboratory
   Bar Harbor, Maine —HL-066611
10. The George Washington University
    Washington, DC —HL-066613
11. Children's Research Institute
    Washington, DC —HL-066614
12. The Johns Hopkins University
    Baltimore, Maryland —HL-066615
13. Boston University
    Boston, Massachusetts —HL-066617
14. The Johns Hopkins University
    Baltimore, Maryland —HL-066618
15. Institute for Genomic Research
    Rockville, Maryland —HL-066619
16. Jackson Laboratory
    Bar Harbor, Maine —HL-066620
17. J. David Gladstone Institutes
    San Francisco, California —HL-066621
18. The Johns Hopkins University
    Baltimore, Maryland —HL-066623
19. Fred Hutchinson Cancer
    Research Center
    Seattle, Washington —HL-066642
20. Massachusetts General Hospital
    Boston, Massachusetts —HL-066678
21. University of California, Berkeley
    Lawrence Berkeley National Laboratory
    Berkeley, California —HL-066681
22. University of Washington
    Seattle, Washington —HL-066682
23. University of California, Berkeley
    Lawrence Berkeley National Laboratory
    Berkeley, California —HL-066691
24. University of California, Berkeley
    Lawrence Berkeley National Laboratory
    Berkeley, California —HL-066713
25. University of California, Berkeley
    Lawrence Berkeley National Laboratory
    Berkeley, California —HL-066727
26. University of California, Berkeley
    Lawrence Berkeley National Laboratory
    Berkeley, California —HL-066728
27. University of California, Berkeley
    Lawrence Berkeley National Laboratory
    Berkeley, California —HL-066729
28. Stanford University
    Stanford, California —HL-066735
29. Brigham and Women's Hospital
    Boston, Massachusetts —HL-066795
30. Brigham and Women's Hospital
    Boston, Massachusetts —HL-066796
31. University of Arizona
    Tucson, Arizona —HL-066800
32. University of Arizona
    Tucson, Arizona —HL-066801
33. University of Arizona
    Tucson, Arizona —HL-066803
34. Brigham and Women's Hospital
    Boston, Massachusetts —HL-066804
35. Brigham and Women's Hospital
    Boston, Massachusetts —HL-066805
36. University of Arizona
    Tucson, Arizona —HL-066806
37. University of Texas
    Southwestern Medical Center
    Dallas, Texas —HL-066880

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

The purpose of this study is to compare a treatment of aggressively lowering LDL cholesterol (goal less than or equal to 75 mg/dL) and blood pressure (goal less than or equal to 115/75 mmHg) to standard care in a population of diabetic American Indians with CVD, but who have relatively low levels of LDL cholesterol and blood pressure.

Obligations

Funding History:
Fiscal Year 2003—$2,164,849
Fiscal Year 2002—$2,409,835
Total Funding to Date—$4,574,684

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 2003—$4,428,138
Fiscal Years 1988–2002—$38,855,307
Total Funding to Date—$43,283,445

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

Sudden Cardiac Death in Heart Failure Trial (SCD-HeFT), Initiated in Fiscal Year 1997

The purpose of this study is to determine whether survival among heart failure patients is improved by the treatment with amiodarone or implantation of a cardioverter defibrillator compared to conventional therapy.

Obligations

Funding History:
Fiscal Year 2003—$1,929,664
Fiscal Years 1997–2002—$9,855,175
Total Funding to Date—$11,784,839

Current Active Organizations and Grant Numbers

1. Duke University
   Durham, North Carolina —HL-055297
2. Duke University
   Durham, North Carolina —HL-055496
3. University of Washington
   Seattle, Washington —HL-055766

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

The objectives of this multicenter, international, randomized trial are twofold: (1) to determine whether CABG plus intensive medical therapy compared to medical therapy alone improves long-term survival in patients with heart failure and left ventricular (LV) dysfunction who have coronary artery disease amenable to surgical revascularization; and (2) to determine whether CABG plus surgical ventricular restoration to a more normal LV size compared to CABG alone improves survival free of subsequent hospitalization in patients with anterior LV dysfunction.

Obligations:

Funding History:
Fiscal Year 2003—$6,542,012
Fiscal Year 2002—$5,709,397
Total Funding to Date—$12,251,409

Current Active Organizations and Grant Numbers

1. Jefferson Medical College
   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 will enter a 6-month weight program. Those who lose at least 9 pounds will be 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 2003—$3,686,738
Total Funding to Date—$3,686,738

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. The 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 to maintain a WISE database and infrastructure to facilitate further investigations into the mechanisms underlying ischemic syndromes in women.

Obligations

Funding History:
Fiscal Year 2003—$1,306,092
Fiscal Years 2001–2003—$3,008,819
Total Funding to Date—$4,314,911

Current Active Organizations and Grant Numbers

1. University of Pittsburgh
Pittsburgh, Pennsylvania —HL-064829
2. University of Pittsburgh
Pittsburgh, Pennsylvania —HL-064914
3. University of Florida
Gainesville, Florida —HL-064924

Lung Diseases Program

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

The objective of ACRN, Phase I was to establish a network of interactive asthma clinical research groups to assess novel treatment methods and to ensure that findings on optimal management of patients with asthma are rapidly disseminated to practitioners and health care professionals. A new program was funded in 2003 as a result of a national competition for participation in the successful 10-year-old asthma clinical research network. The minority patient population will be approximately 33 percent for each protocol.

Obligations

Funding History:
Fiscal Year 2003—$8,181,429
Total Funding to Date—$8,181,429

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 Pittsburgh
Pittsburgh, Pennsylvania —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
Winston-Salem, North Carolina —HL-074225
8. Brigham and Women's Hospital
Boston, Massachusetts —HL-074227
9. Pennsylvania State University
Hershey, Pennsylvania —HL-074231

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 2003—$6,118,604
Fiscal Year 2002—$5,933,220
Total Funding to Date—$12, 051,824

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. The Johns Hopkins University
Baltimore, Maryland —HL-072455
5. Vanderbilt University
Nashville, Tennessee —HL-072471
6. Northwestern University
Chicago, Illinois —HL-072478
7. Brigham and Women's Hospital
Boston, Massachusetts —HL-072494
8. Center for Community Health Education, Research, and Service
Boston, Massachusetts —HL-072495
9. Hektoen Institute for Medical Research
Chicago, Illinois —HL-072496
10. 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 5–12, 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 2003—$1,489,491
Total Funding to Date—$1,489,491

Current Active Organizations and Grant Numbers

1. Washington University
St. Louis, Missouri —HL-075232
2. Hospital for Sick Children
Toronto, Ontario —HL-075407
3. The 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. The 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 2003—$4,912,409
Fiscal Years 1999–2002—$16,223,278
Total Funding to Date—$21,145,687

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.

Inhaled Nitric Oxide for the Prevention of Chronic Lung Disease, Initiated in Fiscal Year 2000

The objective of this clinical trial is to determine whether low-dose inhaled nitric oxide (NO), administered within the first 48 hours of life to premature newborns (weighing between 500 and 1,250 grams) with respiratory failure requiring mechanical ventilation, will prevent development of chronic lung disease.

Obligations

Funding History:
Fiscal Year 2003—$1,441,567
Fiscal Years 2000–2002—$5,526,692
Total Funding to Date—$6,968,259

Current Active Organization and Grant Number

1. The Children's Hospital
   University of Colorado
   Denver, Colorado —HL-064857

Inhaled Nitric Oxide in Prevention of Chronic Lung Disease, Initiated in Fiscal Year 2000

The objective of this clinical trial is to determine whether low-dose inhaled NO, administered to preterm infants (weighing between 500 and 1,250 grams) who continue to require mechanical ventilation at 14 days of age, will reduce the incidence of chronic lung disease.

Obligations

Funding History:
Fiscal Year 2003—$1,604,333
Fiscal Years 2000–2001—$5,128,526
Total Funding to Date—$6,732,859

Current Active Organization and Grant Number

1. Children's Hospital of Philadelphia
   Philadelphia, Pennsylvania —HL-062514

Linkage Study in Familial Pulmonary Fibrosis, Initiated in Fiscal Year 2000

The purpose of this study is to identify a group of genetic loci that may subsequently prove to contain novel genes involved in the development of familial pulmonary fibrosis. Investigators will use standard genetic methodology (linkage analysis) to determine the distribution of polymorphisms for genetic markers in families with familial pulmonary fibrosis.

Obligations

Funding History:
Fiscal Year 2003—$708,660
Fiscal Years 2000–2002—$2,047,291
Total Funding to Date—$2,755,951

Current Active Organization and Grant Number

1. Duke University
   Durham, North Carolina —HL-067467

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 2003—$2,840,148
Fiscal Years 2000–2002—$8,007,228
Total Funding to Date—$10,847,376

Current Active Organization and Grant Number

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

Prospective Investigation of Pulmonary Embolism Diagnosis-II (PIOPED II), Initiated in Fiscal Year 2000

The purpose of this multicenter collaborative study is to determine the sensitivity, specificity, and positive and negative predictive values of spiral computed tomography for diagnosis of acute pulmonary embolism; 30 percent of the patients are expected to be from minority populations.

Obligations

Funding History:
Fiscal Year 2003—$471,625
Fiscal Years 2000–2001—$9,028,494
Total Funding to Date—$9,500,119

Current Active Organizations and Grant Numbers

1. Emory University
   Atlanta, Georgia —HL-063899
2. University of Michigan
   Ann Arbor, Michigan —HL-063928
3. Washington University
   St. Louis, Missouri —HL-063931
4. Duke University
   Durham, North Carolina —HL-063932
5. University of Calgary
   Calgary, Alberta —HL-063940
6. Henry Ford Health Sciences Center
   Detroit, Michigan —HL-063941
7. The George Washington University
   Washington, DC —HL-063942
8. Weill Medical College of
   Cornell University
   New York, New York —HL-063981
9. Massachusetts General Hospital
   Boston, Massachusetts —HL-063982
10. St. Joseph Mercy-Oakland
    Pontiac, Michigan —HL-067453

Sarcoidosis Genetic Linkage Consortium, Initiated in Fiscal Year 1999

The purpose of this multicenter study is to identify sarcoidosis susceptibility genes and determine how these genes and environmental risk factors interact to cause sarcoidosis.

Obligations

Funding History:
Fiscal Year 2003—$833,103
Fiscal Years 1999–2002—$7,094,662
Total Funding to Date—$7,927,765

Current Active Organization and Grant Number

1. Case Western Reserve University
   Henry Ford Health Sciences Center
   Detroit, Michigan —HL-060263

Scleroderma Lung Study, Initiated in Fiscal Year 1999

The purpose of this study is to evaluate the efficacy and safety of cyclophosphamide versus placebo for the prevention and progression of symptomatic pulmonary disease in patients with systemic sclerosis.

Obligations

Funding History:
Fiscal Year 2003—$1,054,741
Fiscal Years 1999–2002—$5,802,482
Total Funding to Date—$6,857,223

Current Active Organizations and Grant Numbers

1. University of Medicine
   and Dentistry of New Jersey
   Piscataway, New Jersey —HL-060550
2. University of California, Los Angeles
   Los Angeles, California —HL-060587
3. The Johns Hopkins University
   Baltimore, Maryland —HL-060597
4. University of California, Los Angeles
   Los Angeles, California —HL-060606
5. Boston University
   Boston, Massachusetts —HL-060682
6. Medical University of South Carolina
   Charleston, South Carolina —HL-060750
7. Georgetown University
   Washington, DC —HL-060794
8. University of Texas
   Houston, Texas —HL-060839
9. University of Illinois
   Chicago, Illinois —HL-060895

Blood Diseases and Resources

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

See Chapter 11. Clinical Trials.

Induction of Stable Chimerism for Sickle Cell Anemia, Initiated in Fiscal Year 2001

The purpose of this study is to investigate a transplant procedure for SCD that significantly reduces the toxicity of allogeneic hematopoietic cell transplantation while retaining its therapeutic benefit.

Obligations

Funding History:
Fiscal Year 2003—$526,886
Fiscal Years 2001–2002—$1,014,151
Total Funding to Date—$1,541,037

Current Active Organization and Grant Number

1. Children's Hospital Oakland
Oakland, California —HL-068091

Reference Laboratory to Evaluate Therapies for Sickle Cell Disease, Initiated Fiscal Year 1997

The purpose of this study is to establish a reference laboratory that will evaluate potentially useful compounds for the treatment of SCD.

Obligations

Funding History:
Fiscal Year 2003—$509,405
Fiscal Years 2001–2002*—$927,748
Total Funding to Date—$1,437,153

Current Active Organization and Grant Number

1. Children's Hospital of Philadelphia
Philadelphia, Pennsylvania —HL-058930

Sibling Donor Cord Blood Banking and Transplantation, Initiated in Fiscal Year 2001

The purpose of this study is to establish a cord blood bank for collecting sibling donor cord blood in families that currently have a child with sickle cell anemia or thalassemia with the intent of future transplantation.

Obligations

Funding History:
Fiscal Year 2003—$1,285,569
Fiscal Years 2001–2002—$2,445,687
Total Funding to Date—$3,731,256

Current Active Organization and Grant Number

1. Children's Hospital Oakland
Oakland, California —HL-061877

Stroke Prevention in Sickle Cell Anemia (STOP 2), Initiated in Fiscal Year 2000

The purpose of this study is to optimize, in high-risk patients with sickle cell anemia, the primary prevention strategy proven effective in STOP. Ninety-eight percent of the patients are expected to come from minority populations.

Obligations

Funding History:
Fiscal Year 2003—$2,320,327
Fiscal Years 2000–2002—$10,827,025
Total Funding to Date—$13,147,352

Current Active Organizations and Grant Numbers

1. New England Research Institutes, Inc.
Watertown, Massachusetts —HL-052016
2. Medical College of Georgia
Augusta, Georgia —HL-052193

Thalassemia (Cooley's Anemia) Clinical Research Network

See Chapter 11. Clinical Trials.

Transfusion Medicine/Hemostasis Clinical Research Network

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

* Became U01 in 2001.

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 2003—$3,020,963
Fiscal Year 2002—$3,223,476
Total Funding to Date—$6,244,439

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 2003—$2,326,850
Fiscal Years 1999–2001—$14,304,831
Total Funding to Date—$16,631,681

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. The 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. The Johns Hopkins University
   Baltimore, Maryland —HL-064360

NHLBI Research Centers (P50, U54, P30) Programs

Specialized Centers of Research (P50) and Specialized Centers of Clinical 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 2003**	**FY 2003**	**Total to Date**
Heart and Vascular Diseases Program				
Ischemic Heart Disease in Blacks	$ 1995–	$ 21,316	$ 3,018	$ 24,334
Ischemic Heart Disease, Sudden Cardiac Death, Heart Failure	1995–	113,769	14,846	128,615
Molecular Genetics of Hypertension	1996–	62,975	9,686	72,661
Molecular Medicine and Atherosclerosis	1997–	43,572	8,280	51,852
Pediatric Cardiovascular Diseases	1993–	44,115	6,710	50,825
Subtotal, Heart and Vascular Diseases Program		285,747	42,540	328,287
Lung Diseases Program				
Acute Lung Injury	1994–	75,286	6,603	81,889
Airway Biology and Pathogenesis of Cystic Fibrosis	1988–	51,821	3,425	55,246
Cellular and Molecular Mechanisms of Asthma	1996–	72,001	15,236	87,237
Pathobiology of Fibrotic Lung Disease	1997–	28,561	5,166	33,727
Pathobiology of Lung Development	1996–	48,045	7,223	55,268
Translational Research in Acute Lung Injury (SCCOR)	2003–	—	11,502	11,502
Subtotal, Lung Diseases Program		275,714	49,155	324,869
Blood Diseases and Resources Program				
Hematopoietic Stem Cell Biology	1995–	34,433	5,593	40,026
Hemostatic and Thrombotic Disorders	1996–	155,221	7,218	162,439
Transfusion Biology and Medicine	1996–	55,745	3,094	58,569
Subtotal, Blood Diseases and Resources Program		245,129	15,905	261,034
National Center on Sleep Disorders Research				
Neurobiology of Sleep and Sleep Apnea	1998–	22,820	6,210	29,030
Subtotal, National Center on Sleep Disorders Research		22,820	6,210	29,030
Total, Specialized Centers of Research (P50)		**$829,410**	**$113,810**	**$943,220**

Ischemic Heart Disease in Blacks

The purpose of this SCOR is to promote interdisciplinary study of issues surrounding ischemic heart disease in blacks. Investigators are using a combination of approaches, including molecular, cellular, and genetic studies; animal experiments; and human studies to advance knowledge in this area.

Obligations

Fiscal Year 2003—$3,017,569

Current Active Organizations and Grant Numbers

1. Boston University
   Boston, Massachusetts —HL-055993
2. Medical College of Wisconsin
   Milwaukee, Wisconsin —HL-065203

Ischemic Heart Disease, Sudden Cardiac Death, Heart Failure

The purpose of this SCOR is to encourage creative, interdisciplinary approaches to elucidation of the etiology and pathophysiology of these diseases at the molecular, cellular, and tissue levels and the translation of research findings into improved diagnosis, treatment, and prevention.

Obligations

Fiscal Year 2003—$14,846,487

Current Active Organizations and Grant Numbers

1. The Johns Hopkins University
   Baltimore, Maryland —HL-052307
2. University of Cincinnati
   Cincinnati, Ohio —HL-052318
3. University of California, Los Angeles
   Los Angeles, California —HL-052319
4. Brigham and Women's Hospital
   Boston, Massachusetts —HL-052320
5. University of Utah
   Salt Lake City, Utah —HL-052338
6. University of California, San Diego
   La Jolla, California —HL-053773
7. Baylor College of Medicine
   Houston, Texas —HL-054313
8. New England Medical Center
   Boston, Massachusetts —HL-063494
9. Harvard University
   Boston, Massachusetts —HL-063609

Molecular Genetics of Hypertension

The goals of five SCOR projects are to study the molecular genetics of hypertension, to provide understanding of the etiology and pathogenesis of hypertension, and to apply new knowledge for the improved diagnosis and management of the disease.

Obligations

Fiscal Year 2003—$9,685,907

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 Hospitals
   Iowa City, Iowa —HL-055006
5. Yale University School of Medicine
   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 2003—$8,280,229

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 Cardiovascular Diseases

The purpose of this SCOR is to apply innovative approaches to elucidate the etiology and pathophysiology of pediatric CVD. Research findings will be trans-

lated into improved diagnosis, treatment, and prevention of CVD in children.

Obligations

Fiscal Year 2003—$6,709,649

Current Active Organizations and Grant Numbers

1. Washington University
   St. Louis, Missouri —HL-061006
2. University of Texas
   Southwestern Medical Center
   Dallas, Texas —HL-061033
3. Harvard University
   Boston, Massachusetts —HL-061036
4. Children's Hospital of Philadelphia
   Philadelphia, Pennsylvania —HL-062177
5. University of Iowa
   Iowa City, Iowa —HL-062178

Lung Diseases Program

Acute Lung Injury

The objective of this SCOR is to examine biochemical, immunological, and physiological mechanisms associated with acute lung injury and repair to improve the diagnosis, management, and prevention of ARDS.

Obligations

Fiscal Year 2003—$6,602,741

Current Active Organizations and Grant Numbers

1. University of California, San Diego
   La Jolla, California —HL-023584
2. University of Washington
   Seattle, Washington —HL-030542
3. University of Minnesota, Twin Cities
   Minneapolis, Minnesota —HL-050152
4. University of Utah
   Salt Lake City, Utah —HL-050153
5. University of Michigan
   Ann Arbor, Michigan —HL-060289

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 2003—$3,424,909

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 program 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 2003—$15,236,019

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 2003—$5,165,589

Current Active Organizations and Grant Numbers

1. University of Michigan
   Ann Arbor, Michigan —HL-056402
2. University of California, Los Angeles
   Los Angeles, California —HL-067665
3. National Jewish Medical
   and Research Center
   Denver, Colorado —HL-067671

Pathobiology of Lung Development

The objective of this program is to foster multidisciplinary research enabling basic science findings to be more 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 2003—$7,223,228

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 of Boston
   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 2003—$11,502,100

Current Active Organization and Grant Numbers

1. The 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
   Ann Arbor, Michigan —HL-074024

Blood Diseases and Resources Program

Hematopoietic Stem Cell Biology

The goal of this SCOR is to advance knowledge of basic stem cell biology in areas of stem cell isolation, quantitation by in vivo assay, in vitro and in vivo growth and replication, gene insertion, and engraftment.

Obligations

Fiscal Year 2003—$5,592,552

Current Active Organizations and Grant Numbers

1. Dana Farber Cancer Institute
   Boston, Massachusetts —HL-054785
2. Children's Hospital
   Los Angeles, California —HL-054850
3. Fred Hutchinson Cancer Research Center
   Seattle, Washington —HL-054881

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 2003—$7,227,831

Current Active Organizations and Grant Numbers

1. Mt. 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

This SCOR has been established 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 2003—$3,094,110

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

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 2003—$6,209,618

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 2003—$20,604,758

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. Children's Hospital Medical Center
   Cincinnati, Ohio —HL-070817
10. Boston Medical Center
    Boston, Massachusetts —HL-070819
11. Yeshiva University
    New York, New York —HL-070994

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

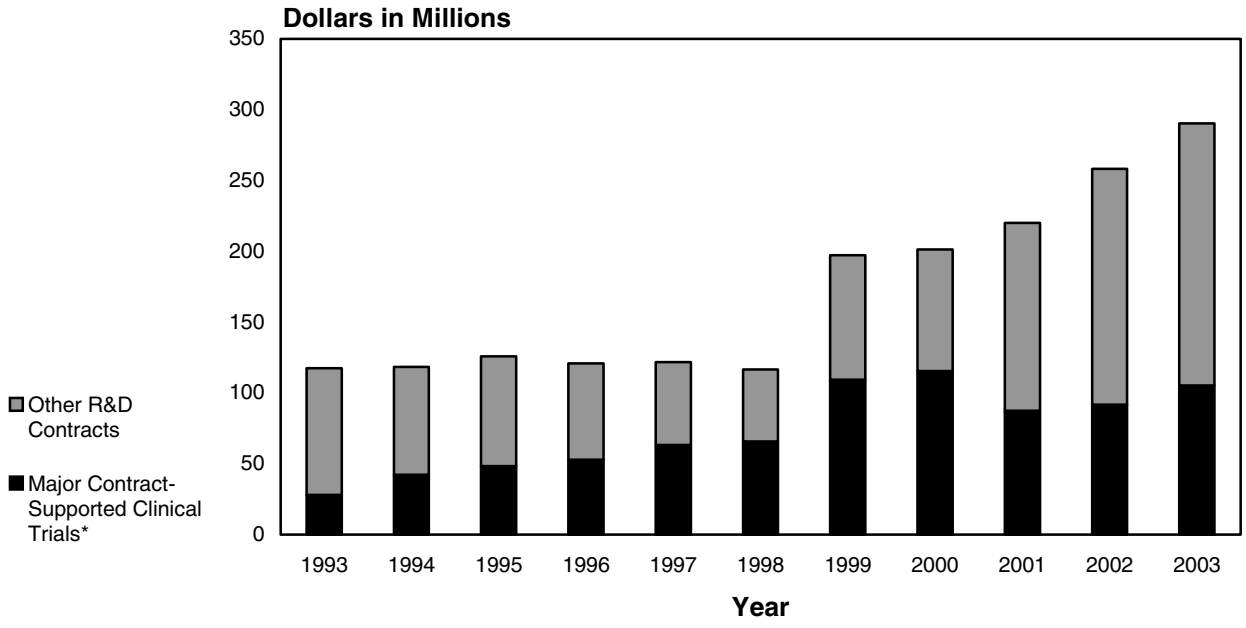
Fiscal Year 2003—$2,306,271

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
   Givi Center for AIDS Research
   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. University of California, San Diego
   La Jolla, California —AI-36214
7. Case Western Reserve University
   Cleveland, Ohio —AI-36219
8. University of Massachusetts
   Medical School
   Worcester, Massachusetts —AI-42845
9. Massachusetts General Hospital
   Boston, Massachusetts —AI-42851
10. Miriam Hospital
    Providence, Rhode Island —AI-42853
11. The Johns Hopkins University
    Baltimore, Maryland —AI-42855
12. University of California, Davis
    Davis, California —AI-49366
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

10. Research and Development Contracts

NHLBI Research and Development Contract Obligations*: Fiscal Years 1993–2003



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

NHLBI Total Research and Development Contract Obligations: Fiscal Years 1993–2003

Dollars (Thousands)

	Fiscal Year										
	1993	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Heart	$ 66,717	$ 67,173	$ 70,178	$ 80,373	$ 84,820	$ 77,886	$ 93,270	$ 98,715	$125,291	$155,971	$195,425
Lung	18,552	21,957	15,414	21,032	18,183	13,123	25,432	23,341	10,993	16,578	11,745
Blood	32,280	29,122	40,324	19,522	18,934	25,695	15,436	21,538	24,572	26,751	20,082
Women's Health Initiative	—	—	—	—	—	—	63,100	57,700	59,200	59,000	63,222
Total	**$117,549**	**$118,252**	**$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]**

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.

Major NHLBI Research and Development Contracts by Program*: Fiscal Years 1993–2003

	Total Obligations Prior to FY 2003	Total FY 2003 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Atherosclerosis Risk in Communities (ARIC)	$113,055,635	$5,407,517	$118,463,152
Cardiovascular Health Study (CHS)	71,496,419	1,106,411	72,602,830
Coronary Artery Risk Development in Young Adults (CARDIA)	58,848,946	1,348,491	60,197,437
Framingham Study	43,564,115	12,584,106	56,148,221
Jackson Heart Study (JHS)	12,318,000	1,973,000	14,291,000
Mammalian Genotyping Service (MGS)	21,519,750	—	21,519,750
Multi-Ethnic Study of Atherosclerosis (MESA)	40,642,999	8,099,000	48,741,999
Protemomics Initiative	27,477,000	43,520,890	72,997,890
Translational Behavioral Science Research Consortium	4,185,000	5,815,000	10,000,000
Lung Diseases			
Tuberculosis Curriculum Coordinating Center	—	2,700,000	2,700,000
Blood Diseases and Resources			
Hemochromatosis and Iron Overload Screening Study (HEIRS)	20,949,352	2,983,300	23,932,652
Maintenance of NHLBI Biological Specimen Repository	4,622,565	981,255	5,603,820
Retrovirus Epidemiology Donor Study (REDS)	67,796,152	977,973	68,774,125
Somatic Cell Therapy Processing Facilities	—	4,095,764	4,095,764

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 2003—$5,407,517
Fiscal Years 1985–2002—$113,055,635
Total Funding to Date—$118,463,152

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. The 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 2003—$1,106,411
Fiscal Years 1988–2002—$71,496,419
Total Funding to Date—$72,602,830

Current Active Organizations and Contract Numbers

1. The Johns Hopkins University
Baltimore, Maryland —HC-15103
2. University of Wisconsin
Madison, Wisconsin —HC-75150
3. University of Washington
Seattle, Washington —HC-85079
4. Wake Forest University
Winston-Salem, North Carolina —HC-85080
5. The 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 disease.

Obligations

Funding History:
Fiscal Year 2003—$1,348,491
Fiscal Years 1984–2002—$58,848,946
Total Funding to Date—$60,197,437

Current Active Organizations and Contract Numbers

1. Harbor-UCLA Research and
Education Institute
Torrance, California —HC-05187
2. University of California at Irvine
Irvine, California —HC-45134
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

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, 500 members still remain. In 1971, the Framingham Offspring Study was initiated to assess familial and genetic factors associated with CHD. More than 5,000 offsprings (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 2003—$12,584,106
Fiscal Years 1983–2002—$43,564,115
Total Funding to Date—$56,148,221

Current Active Organization and Contract Number

1. Boston University Medical Center
Boston, Massachusetts —HC-38038

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 2003—$1,973,000*
Fiscal Years 1998–2002—$12,318,000
Total Funding to Date—$14,291,000

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 2003—$0
Fiscal Years 1994–2002—$21,519,750
Total Funding to Date—$21,519,750

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 2003—$8,099,000
Fiscal Years 1999–2002—$40,642,999
Total Funding to Date—$48,741,999

Current Active Organizations and Contract Numbers

1. University of Washington
   Seattle, Washington —HC-95159
2. University of California, Los Angeles
   Los Angeles, California —HC-95160
3. Columbia University
   New York, New York —HC-95161
4. The 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. The Johns Hopkins University
    Baltimore, Maryland —HC-95168
11. Harbor-UCLA Research and
    Education Institute
    Los Angeles, California —HC-95169

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 towards understanding the molecular basis of the causes and progression of heart, lung, blood, and sleep disorders and identifying targets for therapeutic interventions.

Obligations

Funding History:
Fiscal Year 2003—$43,520,890
Fiscal Year 2002—$29,477,000
Total Funding to Date—$72,997,890

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

Current Active Organizations and Contract Numbers

1. Boston University
   Boston, Massachusetts —HV-28178
2. Institute for Systems Biology
   Seattle, Washington —HV-28179
3. The 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 Medical Branch
   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 2003—$5,815,000
Fiscal Year 2002—$4,185,421
Total Funding to Date—$10,000,000

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

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 2003—$2,700,000
Total Funding to Date—$2,700,000

Current Active Organization and Contract Number

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

Blood Diseases and Resources Program

Hemochromatosis and Iron Overload Screening Study (HEIRS), Initiated in Fiscal Year 2000

The purpose of this project is to determine the prevalence of iron overload and hereditary hemochromatosis and to study genetic and environmental determinants and potential clinical, personal, and societal impact of the disorder.

Obligations

Funding History:
Fiscal Year 2003—$2,983,300
Fiscal Years 2000–2002—$20,949,352
Total Funding to Date—$23,932,652

Current Active Organizations and Contract Numbers

1. University of Minnesota, Twin Cities
   Minneapolis, Minnesota —HC-05185
2. Howard University
   Washington, DC —HC-05186
3. University of Alabama at Birmingham
   Birmingham, Alabama —HC-05188
4. Kaiser Foundation Research Institute
   Oakland, California —HC-05189
5. University of California at Irvine
   Irvine, California —HC-05190
6. London Health Science Centre
   Ontario, Canada —HC-05191

7. Wake Forest University
   Winston-Salem, North Carolina —HC-05192

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 2003—$981,255
Fiscal Years 1998–2002—$4,622,565
Total Funding to Date—$5,603,820

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 is also 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 2003—$977,973
Fiscal Years 1989–2002—$67,796,152
Total Funding to Date—$68,774,125

Current Active Organizations and Contract Numbers

1. University of California, San Francisco
   San Francisco, California —HB-47114
2. Oklahoma Blood Institute
   Oklahoma City, Oklahoma —HB-97078
3. American Red Cross, Greater
   Chesapeake and Potomac Region
   Baltimore, Maryland —HB-97079
4. American Red Cross
   Southern California
   Los Angeles, California —HB-97080
5. American Red Cross
   Southeastern Michigan Region
   Detroit, Michigan —HB-97081
6. Westat, Inc.
   Rockville, Maryland —HB-97082

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 in to clinical practice.

Obligations

Funding History:
Fiscal Year 2003—$4,095,764
Total Funding to Date—$4,095,764

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

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 1993–2003

Research Grants and Cooperative Agreements (Dollars in Thousands)

	Fiscal Year										
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Heart and Vascular Diseases											
Program on Surgical Control of Hyperlipidemias (POSCH)	$ 485	$ 500	$ 538	$ 566	$ 294	$ —	$ —	$ —	$ —	$ —	$ —
Emory Angioplasty Versus Surgery Trial (EAST)	277	288	296	296	—	—	—	—	—	—	—
Asymptomatic Carotid Artery Plaque Study (ACAPS)	—	—	66	70	—	—	—	—	—	—	—
Infant Heart Surgery: Central Nervous System Sequelae of Circulatory Arrest	756	516	598	699	685	582	584	392	75	—	—
Prevention of Early Readmission in Elderly Congestive Heart Failure Patients	112	77	—	—	—	—	—	—	—	—	—
MRFIT Follow-up and Analysis	402	418	—	—	—	—	—	—	—	—	—
Multicenter Unsustained Tachycardia Trial*	2,092	2,095	1,958	504	—	—	—	—	—	—	—
Trial of Aspirin and Vitamin E in Nurses	1,393	1,488	1,426	1,434	1,473	1,536	1,530	1,594	—	—	—
Diet and Exercise for Elevated Risk (DEER)	805	703	—	—	—	—	—	—	—	—	—
Cardiovascular Risk Factors and the Menopause	610	601	451	478	494	528	186	—	—	—	—
Sodium Sensitivity in African Americans	492	97	249	—	—	—	—	—	—	—	—
Montreal Heart Attack Readjustment Trial (M-HART)	298	340	—	—	—	—	—	—	—	—	—
Stress Reduction in Elderly Blacks With Hypertension	321	338	321	—	—	—	—	—	—	—	—
Trial of Nonpharmacologic Intervention in the Elderly (TONE)	1,038	796	729	—	—	—	—	—	—	—	—
CABG Patch Trial*	3,362	3,117	1,344	988	1,171	—	—	—	—	—	—
Women's Antioxidant and Cardiovascular Study (WACS)	586	612	620	643	501	525	540	556	572	598	592
Oral Calcium in Pregnant Women With Hypertension	280	290	306	320	332	—	—	—	—	—	—
Stress Reduction and Atherosclerotic CVD in Blacks	—	219	330	403	407	40	326	339	360	376	394
Enalapril After Anthracycline Cardiotoxicity	—	587	647	707	724	789	—	—	—	—	—
Stress and Anger Management for Blacks With Hypertension	—	221	232	241	250	—	—	—	—	—	—
Estrogen Replacement and Atherosclerosis (ERA) Trial*	—	1,123	260	1,213	965	1,668	1,017	—	—	—	—
Shock Trial: Should We Emergently Revascularize Occluded Coronaries for Cardiogenic Shock?	—	1,070	1,022	1,008	826	874	—	440	362	298	291
HDL-Atherosclerosis Treatment Study	—	484	480	427	445	340	—	326	—	—	—
Influence of Cardiopulmonary Bypass (CPB) Temperature on CABG Morbidity	—	118	107	118	—	—	—	—	—	—	—
Women's Estrogen/Progestin Lipid Lowering Hormone Atherosclerosis Regression Trial (WELL-HART)*	—	—	798	508	1,196	1,269	1,131	—	32	—	—

* Paid by U01/U10.

NHLBI Investigator-Initiated Clinical Trials: Fiscal Years 1993–2003 (continued)

Research Grants and Cooperative Agreements (Dollars in Thousands)

	Fiscal Year										
	1993	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Heart and Vascular Diseases (continued)											
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	—	—	—	—
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
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
Hematocrit Strategy in Infant Heart Surgery*	—	—	—	—	—	—	—	473	557	596	590
Angiotensin-II Blockade in Mitral Regurgitation	—	—	—	—	—	—	—	—	553	610	629
Heart Failure Adherence and Retention Trial (HART)	—	—	—	—	—	—	—	—	795	1,617	1,453
Reduction of Triglycerides in Women on HRT	—	—	—	—	—	—	—	—	708	746	555
Women's Ischemia Syndrome Evaluation (WISE)†	—	—	—	—	—	—	—	—	1,502	1,506	1,643
ACE Inhibition and Novel Cardiovascular Risk Factors	—	—	—	—	—	—	—	—	—	694	656
A CHF Trial Investigating Outcomes of Exercise (ACTION)*	—	—	—	—	—	—	—	—	—	7,471	9,582
Clinical Trial of Dietary Protein on Blood Pressure	—	—	—	—	—	—	—	—	—	655	610
Home Automatic External Defibrillator Trial (HAT)*	—	—	—	—	—	—	—	—	—	3,567	5,433
Perioperative Interventional Neuroprotection Trial (POINT)	—	—	—	—	—	—	—	—	—	553	553
Stop Atherosclerosis in Native Diabetics Study (SANDS)*	—	—	—	—	—	—	—	—	—	2,410	2,165
Surgical Treatment for Ischemic Heart Failure (STICH)*	—	—	—	—	—	—	—	—	—	5,709	4,495
Weight Loss Maintenance (WLM)*	—	—	—	—	—	—	—	—	—	—	3,687
Subtotal, Heart and Vascular Diseases	13,309	16,098	15,987	13,673	19,483	23,265	29,111	26,578	22,996	45,253	47,075

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

NHLBI Investigator-Initiated Clinical Trials: Fiscal Years 1993–2003 (continued)

Research Grants and Cooperative Agreements (Dollars in Thousands)

	Fiscal Year										
	1993	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Lung Diseases											
Emphysema: Physiologic Effects of Nutritional Support	246	155	—	—	—	—	—	—	—	—	—
Cardiopulmonary Effects of Ibuprofen in Human Sepsis*	886	683	—	—	—	—	—	—	—	—	—
Inhaled Beclomethasone to Prevent Chronic Lung Disease*	583	690	738	551	436	—	—	—	—	—	—
Lung Health Study II*†	594	3,307	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
Inhaled Nitric Oxide in Prevention of Chronic Lung Disease*	—	—	—	—	—	—	—	1,548	1,742	1,839	1,604
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	3,034
Childhood Asthma Management Program–Continuation Study (CAMP–CS)/Phase 2*†	—	—	—	—	—	—	—	—	—	—	1,489
Clinical Trial of Acid Reflux Therapy in Asthma*	—	—	—	—	—	—	—	—	—	—	736
Outcomes of Sleep Disorders in Older Men	—	—	—	—	—	—	—	—	—	—	4,163
Supplemental Selenium and Vitamin E and Pulmonary Function	—	—	—	—	—	—	—	—	—	—	698
Subtotal, Lung Diseases	2,309	4,835	5,172	3,734	3,944	7,911	8,844	15,484	17,076	18,974	14,970
Blood Diseases and Resources											
Multicenter Study of Hydroxyurea in Patients With Sickle Cell Anemia—Phase II*	3,221	3,271	1,238	—	—	—	—	—	—	—	—
Chelation Therapy of Iron Overload With Pyridoxal Isonicotinoyl Hydrazone (PIH)	218	—	—	—	—	—	—	—	—	—	—
Trial to Reduce Alloimmunization to Platelets (TRAP)—Extension†	—	2,510	1,246	263	—	—	—	—	—	—	—
Stroke Prevention in Sickle Cell Anemia (STOP)*	—	2,751	3,257	2,435	2,584	2,036	—	293	—	—	—
Pediatric Hydroxyurea in Sickle Cell Anemia (PED HUG)	—	146	250	260	270	—	—	—	—	—	—
Stroke Prevention in Sickle Cell Anemia (STOP 2)*	—	—	—	—	—	—	—	4,493	3,166	3,168	2,320
Induction of Stable Chimerism for Sickle Cell Anemia	—	—	—	—	—	—	—	—	489	525	527
Sibling Donor Cord Blood Banking and Transplantation	—	—	—	—	—	—	—	—	1,222	1,224	1,286
FOCUS	—	—	—	—	—	—	—	—	—	—	1,639
Subtotal, Blood Diseases and Resources	3,439	8,678	5,991	2,958	2,854	2,036	—	4,786	4,877	4,917	5,772
Total, NHLBI	**$19,057**	**$29,611**	**$27,150**	**$20,365**	**$26,281**	**$33,212**	**$37,955**	**$46,848**	**$44,949**	**$69,144**	**$67,817**

* Paid by U01/U10.

† Previously an Institute-Initiated Clinical Trial.

NHLBI Investigator-Initiated Clinical Trials, Fiscal Year 2003: Summary by Program

	Total Obligations Prior to FY 2003	FY 2003 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
ACE Inhibition and Novel Cardiovascular Risk Factors	$ 693,661	$ 655,802	$ 1,349,463
A CHF Trial Investigating Outcomes of Exercise (ACTION)*	7,470,793	9,581,688	17,052,481
Angiotensin-II Blockade in Mitral Regurgitation	1,163,680	629,466	1,793,146
Azithromycin and Coronary Events Study (ACES)*	7,666,911	1,137,313	8,804,224
Bypass Angioplasty Revascularization Investigation in Type 2 Diabetics (BARI 2D)*	19,799,816	8,189,120	27,288,936
Clinical Trial of Dietary Protein on Blood Pressure	655,198	610,220	1,265,418
CVD Risk and Health in Postmenopausal Phytoestrogen Users	2,414,940	152,000	2,566,940
Dietary Patterns, Sodium Intake, and Blood Pressure (DASH Sodium)*	11,356,389	376,544	11,732,933
Heart Failure Adherence and Retention Trial (HART)	2,411,452	1,453,194	3,864,646
Hematocrit Strategy in Infant Heart Surgery*	1,626,224	589,621	2,215,845
Home Automatic External Defibrillator Trial (HAT)*	3,566,730	5,433,157	8,999,887
Occluded Artery Trial (OAT)*	14,298,450	1,963,006	16,261,456
Perioperative Interventional Neuroprotection Trial (POINT)	552,597	553,104	1,105,701
Reduction of Triglycerides in Women on HRT	1,454,599	555,615	2,010,214
Shock Trial: Should We Emergently Revascularize Occluded Coronaries for Cardiogenic Shock?	5,898,147	291,066	6,189,213
Stress Reduction and Atherosclerotic CVD in Blacks	2,800,034	393,634	3,193,668
Stop Atherosclerosis in Native Diabetics Study (SANDS)*	2,409,835	2,164,849	4,574,684
Sudden Cardiac Death in Heart Failure Trial (SCD-HeFT)*	9,855,175	1,929,664	11,784,839
Surgical Treatment for Ischemic Heart Failure (STICH)*	5,709,397	4,494,631	10,204,028
Weight Loss Maintenance (WLM)*	—	3,686,738	3,686,738
Women's Antioxidant and Cardiovascular Study (WACS)	5,752,366	591,750	6,344,116
Women's Ischemia Syndrome Evaluation (WISE)*†	3,008,819	1,642,655	4,651,474
Subtotal, Heart and Vascular Diseases	110,565,213	47,074,837	156,940,050
Lung Diseases			
Apnea Positive Pressure Long-Term Efficacy Study (APPLES)*	3,223,476	3,033,620	6,257,096
Childhood Asthma Management Program–Continuation Study (CAMP–CS)/Phase 2*	—	1,489,491	1,489,491
Clinical Trial of Acid Reflux Therapy in Asthma*	—	736,466	736,466
Inhaled Nitric Oxide for the Prevention of Chronic Lung Disease*	5,526,692	1,441,567	6,968,259
Inhaled Nitric Oxide in Prevention of Chronic Lung Disease*	5,128,526	1,604,333	6,732,859
Outcomes of Sleep Disorders in Older Men	—	4,162,661	4,162,661
Prospective Investigation of Pulmonary Embolism Diagnosis II (PIOPED II)*	9,245,335	471,625	9,716,960
Randomized Trial to Reduce ETS in Children With Asthma	1,567,347	277,065	1,844,412
Scleroderma Lung Study*	5,802,482	1,054,739	6,857,221
Supplemental Selenium and Vitamin E and Pulmonary Function	—	698,489	698,489
Subtotal, Lung Diseases	30,493,858	14,970,056	45,463,914
Blood Diseases and Resources			
FOCUS	—	1,639,478	1,639,478
Induction of Stable Chimerism for Sickle Cell Anemia	1,014,151	526,886	1,541,037
Sibling Donor Cord Blood Banking and Transplantation	2,445,687	1,285,569	3,731,256
Stroke Prevention in Sickle Cell Anemia (STOP 2)*	10,534,463	2,320,327	12,854,790
Subtotal, Blood Diseases and Resources	13,994,301	5,772,260	19,766,561
Total, NHLBI	**$155,053,372**	**$67,817,153**	**$222,170,525**

* Indicates paid by U01/U10.

† Previously an Institute-Initiated Clinical Trial.

Institute-Initiated Clinical Trials: Fiscal Years 1993–2003

Contracts

Dollars (Thousands)

	Fiscal Year										
	1993	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Heart and Vascular Diseases											
Lipid Research Clinics	$ 11	$ 622	$ 583	$ 660	$ 650	$ 685	$ —	$ —	$ —	$ —	$ —
Systolic Hypertension in the Elderly Program (SHEP)	369	—	—	—	—	—	—	—	—	—	—
Cardiac Arrythmia Suppression Trial (CAST)	—	29	—	—	—	—	—	—	—	—	—
Postcoronary Artery Bypass Graft (CABG) Study*	213	—	—	—	—	—	—	—	—	—	—
Prevention and Treatment of Hypertension Study (PATHS)	585	—	—	—	—	—	—	—	—	—	—
Effects of Digitalis on Survival in Patients With Congestive Heart Failure	3,464	270	2,235	—	—	—	—	—	—	—	—
Asymptomatic Cardiac Ischemia Pilot Study (ACIP)	630	210	7	—	—	—	—	—	—	—	—
Psychophysiological Investigations of Myocardial Ischemia (PIMI)	1,400	433	165	—	—	—	—	—	—	—	—
Arterial Disease Multifactorial Intervention Trial (ADMIT)	2,062	2,341	395	—	—	—	—	—	—	—	—
Raynaud's Treatment Study	1,131	2,532	1,664	221	19	—	—	—	—	—	—
Antiarrhythmic vs. Implantable Defibrillator (AVID)	1,203	1,068	5,348	2,475	—	871	548	—	—	—	—
Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT)	2,760	10,914	3,412	9,676	15,943	17,119	—	6,259	7,000	3,980	2,761
Activity Counseling Trial (ACT)	—	1,260	5,000	—	2,167	2,439	—	—	—	—	—
Postmenopausal Estrogen/Progestin Interventions (PEPI)	—	600	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
Public Access Defibrillation (PAD) Community Trial	—	—	—	—	—	—	2,923	2,414	3,058	1,101	—
Subtotal, Heart and Vascular Diseases	13,828	20,279	25,368	29,910	40,111	38,490	26,032	31,350	13,821	12,324	21,942

Institute-Initiated Clinical Trials: Fiscal Years 1993–2003 (continued)

Contracts (continued)

Dollars (Thousands)

	Fiscal Year										
	1993	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Lung Diseases											
Lung Health Study I	—	3,398	650	350	—	—	—	—	—	—	—
Pediatric Pulmonary and Cardiac Complications of HIV Infection (P2C2)	7,814	10,550	2,627	4,033	668	1,979	—	315	—	113	—
Childhood Asthma Management Program (CAMP)	11,361	9,745	5,096	7,977	5,695	—	6,551	729	1,330	2,786	2,287
Acute Respiratory Distress Syndrome Clinical Network (ARDSNET)	—	1,800	4,170	4,337	4,510	4,880	6,837	5,587	2,667	1,502	4,402
National Emphysema Treatment Trial (NETT)	—	—	—	—	2,710	3,367	7,545	4,047	6,989	7,910	1,630
Feasibility of Retinoid Treatment in Emphysema (FORTE)	—	—	—	—	—	—	884	7,711	—	2,429	725
Subtotal, Lung Diseases	19,175	25,493	12,543	16,697	13,583	10,226	21,817	18,389	10,986	14,740	9,044
Blood Diseases and Resources											
Clinical Course of Sickle Cell Disease	1,756	2,390	4,375	376	205	2,144	350	106	—	—	—
Penicillin Prophylaxis in Sickle Cell Disease (PROPS II)	1,095	226	—	—	—	—	—	—	—	—	—
Anti-HIV Immunoglobulin (HIVIG) in Prevention of Maternal-Fetal HIV Transmission	—	3,016	1,819	706	—	—	—	—	—	—	—
T-Cell Depletion in Unrelated Donor Marrow Transplantation	—	1,310	1,917	1,461	639	2,228	690	1,085	1,144	557	774
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
Multicenter Study of Hydroxyurea (MSH) in Sickle Cell Anemia Adult Follow-up	—	—	—	703	472	475	469	—	—	588	994
Pediatric Hydroxyurea Phase III Clinical Trial (BABY HUG)	—	—	—	—	—	—	—	1,606	405	3,100	1,112
Subtotal, Blood Diseases and Resources	2,851	6,942	13,111	10,312	10,242	19,045	2,965	8,258	3,395	6,411	3,468
Women's Health Initiative											
Subtotal, Women's Health Initiative	—	—	—	—	—	—	59,100	57,700	59,200	59,010	63,222
Total, NHLBI Clinical Trials Contracts	**$35,854**	**$52,714**	**$51,022**	**$56,919**	**$63,936**	**$67,761**	**$109,914**	**$115,697**	**$87,402**	**$92,485**	**$97,676**

* Gift Fund (unappropriated) used: $4,662,000—FY 1994; $1,320,000—FY 1995; and $917,720—FY 1996.

Institute-Initiated Clinical Trials: Fiscal Years 1993–2003 (continued)

Cooperative Agreements

Dollars (Thousands)

	Fiscal Year										
	1993	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Heart and Vascular Diseases											
Trials of Hypertension Prevention (TOHP)	$5,111	$4,385	$1,240	$ 649	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Dietary Intervention Study in Children (DISC)	1,686	1,615	1,625	1,625	746	—	—	—	—	—	—
Bypass Angioplasty Revascularization Investigation (BARI)	3,978	3,965	3,882	2,757	2,894	1,360	1,609	1,634	1,549	1,456	—
Postmenopausal Estrogen/ Progestin Interventions (PEPI)	1,516	1,109	584	331	—	—	—	—	—	—	—
Child and Adolescent Trial for Cardiovascular Health (CATCH)	6,077	2,586	2,342	2,682	3,956	572	210	—	—	—	—
Cholesterol Reduction in Seniors Program (CRISP)	—	—	—	—	—	—	—	—	—	—	—
Dietary Effects on Lipoproteins and Thrombogenic Activity (DELTA)	3,213	3,121	2,485	132	290	—	—	—	—	—	—
Obesity Prevention in Young American Indians (PATHWAYS)	1,689	1,814	2,150	3,432	4,119	3,945	4,196	2,459	—	—	—
Dietary Approaches to Stop Hypertension (DASH)	1,650	2,350	2,513	899	—	—	—	—	—	—	—
Rapid Early Action for Coronary Treatment (REACT)	—	2,609	5,091	4,992	2,866	496	—	—	—	—	—
Girls Health Enrichment Multisite Studies (GEMS)	—	—	—	—	—	—	2,282	2,365	2,877	2,713	2,461
Trial of Activity for Adolescent Girls (TAAG)	—	—	—	—	—	—	—	5,274	4,831	5,919	5,828
Pediatric Cardiovascular Clinical Research Network	—	—	—	—	—	—	—	—	3,447	4,822	5,381
Subtotal, Heart and Vascular Diseases	24,920	23,554	21,912	17,499	14,871	6,373	8,297	11,732	12,704	14,910	13,670
Lung Diseases											
Asthma Clinical Research Network (ACRN)*	2,500	3,694	3,640	4,526	4,479	—	—	—	—	—	8,181
Asthma and Pregnancy Studies	—	1,000	991	1,000	913	—	—	—	—	—	—
Childhood Asthma Research and Education (CARE) Network	—	—	—	—	—	—	4,175	5,002	5,314	6,005	5,610

* Investigator-Initiated from 1998 to 2002.

Institute-Initiated Clinical Trials: Fiscal Years 1993–2003 (continued)

Cooperative Agreements (continued)

Dollars (Thousands)

	Fiscal Year										
	1993	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
COPD Clinical Research Network	—	—	—	—	—	—	—	—	—	—	6,843
Subtotal, Lung Diseases	2,500	4,694	4,631	5,526	5,392	—	4,175	5,002	5,314	6,005	20,634
Blood Diseases and Resources											
Trial to Reduce Alloimmunization to Platelets (TRAP)	1,422	—	—	—	—	—	—	—	—	—	—
Thalassemia (Cooley's Anemia) Clinical Research Network	—	—	—	—	—	—	—	2,192	2,219	2,269	2,320
Blood and Marrow Transplant Clinical Research Network	—	—	—	—	—	—	—	—	5,360	5,899	5,950
Transfusion Medicine/ Hemostasis Clinical Research Network	—	—	—	—	—	—	—	—	—	6,053	6,241
Subtotal, Blood Diseases and Resources	1,422	—	—	—	—	—	—	2,192	7,579	14,221	14,511
Total, NHLBI-Initiated Clinical Trials, Cooperative Agreements	**$28,842**	**$28,248**	**$26,543**	**$23,025**	**$20,263**	**$6,373**	**$12,472**	**$18,926**	**$25,597**	**$35,136**	**$48,815**
Total, NHLBI-Initiated Clinical Trials	**$64,696**	**$80,962**	**$77,565**	**$79,944**	**$84,199**	**$74,134**	**$122,386**	**$134,623**	**$112,999**	**$127,621**	**$146,491**

Institute-Initiated Clinical Trials, Fiscal Year 2003: Summary by Program

Contracts

	Total Obligations Prior to FY 2003	Total FY 2003 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Action to Control Cardiovascular Risk in Diabetes (ACCORD)	$ 12,469,570	$ 18,520,563	$30,990,133
Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT)	77,063,355	2,760,704	$79,824,059
Enhancing Recovery in Coronary Heart Disease Patients (ENRICHD)	29,417,300	69,624	$29,486,924
Evaluation Study of Congestive Heart Failure and Pulmonary Artery Catheterization Effectiveness (ESCAPE)	4,699,537	—	$4,699,537
Prevention of Events With Angiotensin Converting Enzyme Inhibitor Therapy (PEACE)	20,992,437	557,563	$21,550,000
Women's Angiographic Vitamin and Estrogen Trial (WAVE)	11,058,620	32,000	$11,090,620
Subtotal, Heart and Vascular Diseases	155,700,819	21,940,454	$177,641,273
Lung Diseases			
Acute Respiratory Distress Syndrome Clinical Network (ARDSNET)	36,290,000	4,402,155	40,692,155
Childhood Asthma Management Program (CAMP)	52,558,800	2,286,805	54,845,605
Feasibility of Retinoid Treatment in Emphysema (FORTE)	11,024,001	725,282	11,749,283
National Emphysema Treatment Trial (NETT)	32,568,000	1,630,310	34,198,310
Subtotal, Lung Diseases	132,440,801	9,044,552	141,485,353
Blood Diseases and Resources			
Cord Blood Stem Cell Transplantation Study (COBLT)	31,111,172	588,193	31,699,365
Multicenter Study of Hydroxyurea (MSH) in Sickle Cell Anemia Adult Follow-up	2,706,820	993,923	3,700,743
Pediatric Hydroxyurea Phase III Clinical Trial (BABY HUG)	5,111,192	1,112,376	6,223,568
T-Cell Depletion in Unrelated Donor Marrow Transplantation	11,031,223	773,695	11,804,918
Subtotal, Blood Diseases and Resources	49,960,407	3,468,187	53,428,594
Women's Health Initiative			
Subtotal, Women's Health Initiative	551,910,108	63,222,053	615,132,161
Total, NHLBI-Initiated Clinical Trials, Contracts	**$890,012,135**	**$97,675,246**	**$987,687,381**

Cooperative Agreements

	Total Obligations Prior to FY 2003	Total FY 2003 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Girls Health Enrichment Multisite Studies (GEMS)	10,237,057	2,461,487	12,698,544
Pediatric Cardiovascular Clinical Research Network	8,269,577	5,380,652	13,650,229
Trial of Activity for Adolescent Girls (TAAG)	16,024,722	5,828,313	21,853,035
Subtotal, Heart and Vascular Diseases	34,531,356	13,670,452	48,201,808
Lung Diseases			
Asthma Clinical Research Network	—	8,181,429	8,181,429
Childhood Asthma Research and Education (CARE) Network	20,496,205	5,609,827	26,106,032
COPD Clinical Research Network	—	6,843,405	6,843,405
Subtotal, Lung Diseases	20,496,205	20,634,661	41,130,866
Blood Diseases and Resources			
Blood and Marrow Transplant Clinical Research Network	11,259,414	5,949,873	17,209,287
Thalassemia (Cooley's Anemia) Clinical Research Network	6,679,892	2,319,991	8,999,883
Transfusion Medicine/Hemostasis Clinical Research Network	6,052,717	6,240,913	12,293,630
Subtotal, Blood Diseases and Resources	23,992,023	14,510,777	38,502,800
Total, NHLBI-Initiated Clinical Trials, Cooperative Agreements	**$79,019,584**	**$48,815,890**	**$127,835,474**
Total, NHLBI-Initiated Clinical Trials	**$969,031,719**	**$146,491,136**	**$1,115,522,855**

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 2003—$18,520,563
Fiscal Years 1999–2002—$12,469,570
Total Funding to Date—$30,990,133

Current Active Organizations and Contract Numbers

1. Wake Forest University
   Winston-Salem, North Carolina —HC-95178
2. McMaster University
   Hamilton, Ontario —HC-95179
3. University of Washington
   Seattle, Washington —HC-95180
4. Case Western Reserve University
   Cleveland, Ohio —HC-95181
5. Wake Forest University
   Winston-Salem, North Carolina —HC-95182
6. Minneapolis Medical Research Foundation
   Minneapolis, Minnesota —HC-95183
7. 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 2003—$2,760,704
Fiscal Years 1993–2002—$77,063,355
Total Funding to Date—$79,824,059

Current Active Organization and Contract Number

1. University of Texas Health Science Center
   Houston, Texas —HC-35130

Enhancing Recovery in Coronary Heart Disease Patients (ENRICHD), Initiated in Fiscal Year 1995

The objective of this multicenter, randomized clinical trial was to test whether treating symptoms of depression and low social support with cognitive behavior therapy and selective serotonin re-uptake inhibitors immediately after MI reduces morbidity and mortality. The primary endpoint was a combination of reinfarction and death. Secondary outcomes included changes in cardiovascular mortality, depression, social support, and quality of life. The cohort included 34 percent minorities. Results showed that the treatment did not lower mortality or the risk of a second heart attack. However, the intervention reduced patients' depression and increased their level of social support.

Obligations

Funding History:
Fiscal Year 2003—$69,624
Fiscal Years 1995–2002—$29,417,300
Total Funding to Date—$29,486,924

Current Active Organizations and Contract Numbers

1. University of North Carolina at Chapel Hill
   Chapel Hill, North Carolina —HC-55140
2. Duke University
   Durham, North Carolina —HC-55142
3. Washington University
   St. Louis, Missouri —HC-55146

Evaluation Study of Congestive Heart Failure and Pulmonary Artery Catheterization Effectiveness (ESCAPE), Initiated in Fiscal Year 1999

The purpose of this study is to compare the efficacy of pulmonary artery catheterization-directed treatment strategy to a noninvasive treatment strategy on morbidity and mortality in patients with severe CHF.

Obligations

Funding History:
Fiscal Year 2003—$0
Fiscal Years 1999–2002—$4,699,537
Total Funding to Date—$4,699,537

Current Active Organization and Contract Number

1. Duke University
   Durham, North Carolina —HV-98177

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 high 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 2003—$2,461,487
Fiscal Years 1999–2002—$10,237,057
Total Funding to Date—$12,698,544

Current Active Organizations and Grant Numbers

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

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 2003—$5,380,652
Fiscal Years 2001–2002—$8,269,577
Total Funding to Date—$13,650,229

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

Prevention of Events With Angiotensin Converting Enzyme Inhibitor Therapy (PEACE), Initiated in Fiscal Year 1996

This multicenter, randomized trial is determining whether addition of an ACE inhibitor to standard therapy in patients with known coronary artery disease and preserved left ventricular function will prevent CVD mortality and reduce risk of MI and the need for revascularization.

Obligations

Funding History:
Fiscal Year 2003—$557,563
Fiscal Years 1996–2002—$20,992,437
Total Funding to Date—$21,550,000

Current Active Organization and Contract Number

1. The George Washington University
   Biostatistics Center
   Rockville, Maryland —HC-65149

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

This community-based study is testing the effects of a school-community linked intervention to prevent decline

in physical activity and cardiorespiratory fitness seen during adolescence in girls. The study will be conducted in 36 schools; 30 percent of the population will be minorities.

Obligations

Funding History:
Fiscal Year 2003—$5,828,313
Fiscal Years 2000–2002—$16,024,722
Total Funding to Date—$21,853,035

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. The Johns Hopkins University
Baltimore, Maryland —HL-066857
7. University of Arizona
Tucson, Arizona —HL-066858

Women's Angiographic Vitamin and Estrogen Trial (WAVE), Initiated in Fiscal Year 1996

This multicenter, randomized trial is assessing whether or not HRT and/or antioxidant treatment stabilize or inhibit progression and induce regression of coronary plaques in women. The trial is also examining the mechanisms by which these treatments modify atherosclerosis. The primary end points are angiographic changes.

Obligations

Funding History:
Fiscal Year 2003—$32,000
Fiscal Years 1996–2002—$11,058,620
Total Funding to Date—$11,090,620

Current Active Organizations and Grant Numbers

1. The George Washington University
Washington, DC —HV-68165
2. University of Alabama at Birmingham
Birmingham, Alabama —HV-68166
3. Duke University
Durham, North Carolina —HV-68167
4. Medlantic Research Institute
Washington, DC —HV-68168
5. Hartford Hospital
Hartford, Connecticut —HV-68169
6. The Johns Hopkins University
Baltimore, Maryland —HV-68170

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 2003—$4,402,155
Fiscal Years 1994–2002—$36,290,000
Total Funding to Date—$40,692,155

Current Active Organizations and Contract Numbers

1. Vanderbilt University
Nashville, Tennessee —HR-46054
2. University of Washington
Seattle, Washington —HR-46055
3. Duke University Medical Center
Durham, North Carolina —HR-46056
4. University of Michigan
Ann Arbor, Michigan —HR-46057
5. University of Pennsylvania Hospital
Philadelphia, Pennsylvania —HR-46058
6. University of California, San Francisco
San Francisco, California —HR-46059
7. Cleveland Clinic Foundation
Cleveland, Ohio —HR-46060
8. University of Colorado
Denver, Colorado —HR-46061
9. Latter Day Saints Hospital
Salt Lake City, Utah —HR-46062
10. University of Maryland
Baltimore, Maryland —HR-46063
11. Coordinating Center
Massachusetts General Hospital
Boston, Massachusetts —HR-46064
12. Baylor College of Medicine
Houston, Texas —HR-16146
13. Baystate Medical Center
Springfield, Massachusetts —HR-16147

14. University of British Columbia
Vancouver, Canada —HR-16148
15. University of Chicago
Chicago, Illinois —HR-16149
16. Louisiana State University
New Orleans, Louisiana —HR-16150
17. University of Pittsburgh
Pittsburgh, Pennsylvania —HR-16152
18. University of Texas
San Antonio, Texas —HR-16153
19. University of Virginia
Charlottesville, Virginia —HR-16154
20. Wake Forest University
Winston-Salem, North Carolina —HR-16155

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 2003—$8,181,429
Total Funding to Date—$8,181,429

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 Pittsburgh
Pittsburgh, Pennsylvania —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 2003—$2,286,805
Fiscal Years 1991–2002—$52,558,800
Total Funding to Date—$54,845,605

Current Active Organizations and Contract Numbers

1. The 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. The Johns Hopkins University
Baltimore, Maryland —HR-16052

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

The purpose of this study 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 2003—$5,609,827
Fiscal Years 1999–2002—$20,496,205
Total Funding to Date—$26,106,032

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 2003—$6,843,405
Total Funding to Date—$6,843,405

Current Active Organizations and Grant Numbers

1. Harbor-UCLA Research
   and Education Institute
   Torrance, California —HL-074407
2. Denver Health and Hospital Authority
   Denver, Colorado —HL-074409
3. Minnesota Veterans Research Institute
   Minneapolis, Minnesota —HL-074416
4. University of Alabama at Birmingham
   Birmingham, Alabama —HL-074418
5. University of Minnesota, Twin Cities
   Minneapolis, Minnesota —HL-074424
6. Brigham and Women's Hospital
   Boston, Massachusetts —HL-074428
7. University of California, San Francisco
   San Francisco, California —HL-074431
8. 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 2003—$725,282
Fiscal Years 1999–2002—$11,024,001
Total Funding to Date—$11,749,283

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

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 2003—$1,630,310
Fiscal Years 1997–2002—$32,568,000
Total Funding to Date—$34,198,310

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
    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. The 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 2003—$5,949,873
Fiscal Year 2001–2002—$11,259,414
Total Funding to Date—$17,209,287

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. The Johns Hopkins University
    Baltimore, Maryland —HL-069310
14. Sloan Kettering Institute
    for Cancer Research
    New York, New York —HL-069315
15. University of Michigan
    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

This multicenter study is designed to show 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 2003—$588,193
Fiscal Years 1996–2002—$31,111,172
Total Funding to Date—$31,699,365

Current Active Organizations and Contract Numbers

1. The EMMES Corporation
   Potomac, Maryland —HB-67132
2. Dana Farber Cancer Center
   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 2003—$993,923
Fiscal Year 1996–2002—$2,706,820
Total Funding to Date—$3,700,743

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 2003—$1,112,376
Fiscal Years 2000–2002—$5,111,192
Total Funding to Date—$6,223,568

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. The 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

T-Cell Depletion in Unrelated Donor Marrow Transplantation, Initiated in Fiscal Year 1994

The purpose of this randomized multicenter clinical trial is to determine whether a reduction in morbidity and mortality from acute and chronic graft-versus-host disease can be achieved without a counterbalancing increase in relapse of leukemia in patients receiving an unrelated donor marrow transplant.

Obligations

Funding History:
Fiscal Year 2003—$773,695
Fiscal Years 1994–2002—$11,031,223
Total Funding to Date—$11,804,918

Current Active Organizations and Contract Numbers

1. The EMMES Corporation
   Potomac, Maryland —HB-47094

2. University of Minnesota, Twin Cities
Minneapolis, Minnesota —HB-47095
3. University of Kentucky
Lexington, Kentucky —HB-47097
4. Sloan-Kettering Institute
for Cancer Research
New York, New York —HB-47098

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 2003—$2,319,991
Fiscal Years 2000–2002—$6,679,892
Total Funding to Date—$8,999,883

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 2003—$6,240,913
Fiscal Year 2002—$6,052,717
Total Funding to Date—$12,293,630

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. The 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
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 2003—$63,222,053
Fiscal Years 1992–2002*—$551,910,108
Total Funding to Date—$615,132,161

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. The 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. The 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

* 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.

33. Harbor-UCLA Research and Education Institute
Torrance, California —WH-42120
34. Kaiser Foundation Research Institute
Oakland, California —WH-42121
35. Medical College of Wisconsin
Milwaukee, Wisconsin —WH-42122
36. Medlantic Research Institute
Washington, DC —WH-42123
37. Rush-Presbyterian-St. Luke's Medical Center
Chicago, Illinois —WH-42124
38. University of California, Los Angeles School of Medicine
Los Angeles, California —WH-42125
39. University of Cincinnati Medical Center
Cincinnati, Ohio —WH-42126
40. University of Florida College of Medicine
Gainesville, Florida —WH-42129
41. University of Hawaii at Manoa
Honolulu, Hawaii —WH-42130
42. University of Miami
Miami, Florida —WH-42131
43. University of Wisconsin
Madison, Wisconsin —WH-42132

12. Minority Activities

Throughout its history, the NHLBI has been a leader in conducting and supporting research to eliminate health disparities that exist between various segments of the U.S. population. The Institute has not only initiated research projects with significant minority participation in order to compare health status between various populations, but also has 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 underrepresented minorities in scientific research. In 2001, the NHLBI conducted a workshop on Recruitment and Retention of African Americans, Hispanic Americans, and Native Americans in Scientific Research Careers Relevant to Heart, Lung, Blood, and Sleep Disorders: What Works, What Doesn't, and What Should We Do? Several recommendations from the workshop addressed efforts to increase the "science career pipeline," and suggested actions that were consolidated into an initiative.

- 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 the biomedical and behavioral sciences.

Additional training programs have been initiated recently to provide career development for minorities in biomedical science.

- Sickle Cell Scholars Program: Supports career development for young or new investigators in SCD research.
- Research Scientist Award for Minority Institutions: Develops, expands, or improves didactic programs in clinical research at minority institutions so that clinical investigators can compete more effectively for research funding.

The Office of Minority Health Affairs (OMHA) within the OD was established in July 2002 to oversee, coordinate, support, and evaluate Institute programs related to minority health outcomes, including research, research training and career development, public outreach, and translation of research findings. Among its roles, the OMHA coordinates activities to improve the health of racial and ethnic populations for heart, lung, and blood diseases and sleep disorders by fostering greater participation of underrepresented minorities in NHLBI research and research training programs. Selected activities in FY 2003 included:

- Issuing four minority training and career development RFAs to increase the number of highly trained minority individuals conducting biomedical and behavioral research.
- Participating in DHHS-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.
- Providing support to the MARC U*STAR Program to enable minority students to work in NHLBI intramural laboratories during the summer.
- Supporting the African-American, Hispanic, and Native American Youth Initiatives to bring minority students to the NIH campus for scientific presentations, an introduction to NHLBI research training and career

development programs, and a tour of NHLBI laboratories.

See Chapter 13 for additional NHLBI-supported minority research training and career development programs.

The NHLBI has contributed to an NIH-wide effort to formulate a comprehensive plan to address health disparities. This plan, which identified ongoing Institute activities and described goals and objectives for the future, serves as a guide for many NHLBI programs targeted to minority communities.

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 pivotal in 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): Determines 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): Investigates the association of CHD risk factors with development of atherosclerosis and CVD in an adult population; 38 percent of the participants are black.
- CHS (see Chapter 10): Examines risk factors for CHD and stroke in the elderly; 20 percent of the participants are minorities.
- Strong Heart Study (see Chapter 9): Compares risk factor levels and morbidity and mortality from CVD among American Indians from three different geographic locations.
- JHS (see Chapter 10): Identifies environmental and genetic factors influencing evolution and progression of CVD in blacks.
- MESA (see Chapter 10): Examines 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): Documents CVD risk factors and measures of subclinical disease in approximately 40 extended Alaska Native families. Identifies and characterizes genes that contribute to CVD.
- HEIRS (see Chapter 10): Determines the prevalence of hereditary hemochromatosis; identifies genetic and environmental determinants and potential clinical, personal, and societal impact of iron overload in an adult population consisting of 28 percent blacks, 13 percent Asians, and 13 percent Hispanics.

Several investigator-initiated epidemiologic studies are examining gene-environment interactions that increase CVD risk factors among various racial groups. Included are studies that compare gene-environment interactions in black populations in Africa, the Caribbean, and selected areas of the United States; compare 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 seek to identify and map specific genes that contribute to CVD risk in Mexican-Americans.

A study of the etiology of atherosclerosis focusing on diet and oxidative mechanisms examines new risk factors that promote or inhibit LDL damage and inflammatory responses in the artery wall. Investigators are seeking to determine the relationship between longitudinal change in atherosclerosis and dietary antioxidants, antioxidant enzymes, and genetic polymorphisms; 43 percent of the participants are Hispanic.

The NHLBI supports research on the impact of adolescent lifestyle on the development of CVD. One project being conducted in youths, half of whom are black, examines the influences of diet and exercise on adiposity and regional fat distribution and the subsequent relationship between the two factors and development of CVD. Another is tracking development of cardiovascular, behavioral, and physiological risk factors in Hispanic children and adolescents.

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 cardiovascular disease and other risk factors in both men and women.

Additional epidemiologic studies being supported include (1) a multicenter study to investigate cardiovascular and metabolic responses to endurance training, contribution of genetic factors to the accompanying response of CVD, and type 2 diabetes risk factors in a population that is 46 percent black; (2) 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; (3) 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 (4) a project to examine the relationship between neighborhood socioeconomic characteristics and the prevalence and progression of subclinical atherosclerosis in an ethnically diverse population consisting of approximately 30 percent blacks, 10 percent Asians, and 20 percent Hispanics.

Treatment and Prevention

Many evidence-based guidelines have been developed for the treatment of cardiovascular, lung, and blood diseases, but they are often not adopted in routine clinical practice. In addition, recent studies have shown substantial differences in physician decision-making for cardiac diagnostic and therapeutic interventions after controlling or adjusting for SES and reimbursement system. Differences based on race and sex have been demonstrated, but the reasons behind them and possible avenues for modifying them have not been articulated. In 2002, the Institute launched a program to identify obstacles to the implementation of national evidence-based guidelines and to develop effective interventions to stimulate their use.

Because CVD evolves over decades, early intervention programs to reduce multiple risk factors can aid in preventing CVD in later years. The Institute supports several investigator-initiated early intervention studies among diverse populations. Included among them is a project to compare the effectiveness of a community-based intervention using neighborhood health care workers to a program that provides assistance through referral to primary care resources. High-risk siblings of blacks with premature coronary disease are targeted. Another project works with black churches in Atlanta to promote adoption of a healthy lifestyle among blacks. A third project is examining the contribution of demographic and cultural factors to diet and sedentary practices that lead to CVD among Hispanic women to enable development of a cardiovascular intervention program specifically for them.

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 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.

- Cardiovascular Health Outreach and Education in Public Housing Communities: Empowers blacks who reside in Baltimore City public housing developments to take charge of improving their cardiovascular health by adopting a heart healthy lifestyle.
- Salud para su Corazón: Disseminates information on CVD prevention, intervention, and treatment and promotes heart healthy behaviors in Hispanic communities.
- NHLBI-Indian Health Service Partnership to Strengthen the Heartbeat of American Indian and Alaska Native Communities: Plans, develops, and implements effective approaches to improve the cardiovascular health of American Indians and Alaska Natives within three tribal communities.
- NHLBI Asian American and Pacific Islanders Heart Health Outreach Project: Develops culturally and linguistically appropriate outreach activities and tools (e.g., CVD risk factor fact sheets) to increase community awareness of heart disease and its

associated risk factors and promotes heart healthy lifestyles among a diverse Asian American and Pacific Islander population.

In addition to the activities mentioned above, the Institute prepares publications on CVD prevention for minority populations. They may be obtained from the NHLBI public Web site or through the NHLBI online catalog. Examples include:

- *Improving Cardiovascular Health in African Americans Package of Seven Easy-To-Read Booklets*
- *Heart-Healthy Home Cooking African American Style*
- *Treat Your Heart to a Healthy Celebration*
- *Package of Eight Easy-To-Read Booklets* in Spanish and English on Preventing Heart Disease
- *Bringing Heart Health to Latinos: A Guide for Building Community Programs.*

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 in the etiology and pathophysiology of high blood pressure include:

- Molecular Genetics of Hypertension (see Chapter 9): Determines the etiology and pathogenesis of hypertension and its complications in order to improve diagnosis and treatment of the disease. Many of the subprojects have a high percentage of minority participation; others target blacks or Hispanics exclusively.
- Family Blood Pressure Program (see Chapter 9): Uses 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.

The Institute supports a number of investigator-initiated projects to examine antecedents of hypertension in children to determine racial differences in blood pressure regulation. Researchers are investigating 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.

Impaired sodium regulation also appears to be linked to the development of hypertension. Scientists are investigating various kidney proteins that regulate sodium reabsorption and have found associations of some genetic variants of the proteins among blacks with hypertension. Another group of scientists is investigating the effects of stress on salt retention and measuring hormonal variables known to influence sodium regulation in a population of obese and nonobese black youths. They are seeking to determine whether the mechanisms regulating sodium retention differ between the two groups. A third group is examining the role of sodium and obesity in hypertension development among blacks living in three different environments: Nigeria, Jamaica, and Chicago.

Investigators have observed that blacks have an augmented blood pressure response to salt. A study has been initiated to improve understanding of the genetic basis and phenotypic characterization of salt-sensitive hypertension in blacks.

Researchers are also 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 studying the combined influence of low SES and ethnicity on development of behavioral risk factors and testing the extent to which they mediate associations between sociodemographic factors, stress, and cardiovascular markers in adolescents. 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. A new project was launched to study the genetics of cardiovascular reactivity in black youth.

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 dietary components (i.e., proteins, lipids, carbohydrates, amino acids, calcium, magnesium, sodium, potassium, antioxidants, fiber, and caffeine) on blood pressure.

The NHLBI supports a number of 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 kallikrein-kinin system, and sodium transport.

Treatment and Prevention

Identifying effective treatment strategies for various populations requires large-scale studies with representative populations in sufficient numbers.

- ALLHAT (see Chapter 11): Compares 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, determines 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.

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. Another group is focusing on variations in the ACE gene between blacks and whites to explain racial differences in the antihypertensive responsiveness to ACE inhibitors.

Because stress may be a major contributor to CVD among blacks, interventions to reduce stress, such as Transcendental Meditation and aerobic activities, are being tested in this population to evaluate their effectiveness in reducing blood pressure levels. Another intervention being evaluated concerns the efficacy of emotional disclosure writing in lowering lower blood pressure; 71 percent of the participants are minorities.

Stress also may be a major contributor to CVD among American Indians. Investigators are evaluating the long-term effects of posttraumatic stress disorder—a common disorder among reservation-dwelling Indians—on the cardiovascular system and the role of lifestyle, cultural, and biological mediators in the relationship of post-traumatic stress disorders with coronary flow reserve and heart rate variability.

The NHLBI is concerned about the lack of treatment adherence in minorities and individuals living in poverty. To address this issue, it has initiated a program to evaluate innovative methods to overcome patient, provider, and medical systems barriers that obstruct treatment adherence among racial and ethnic minorities and persons living in poverty. One project is determining whether an electronic home monitor that can transmit vital signs from a patient's home to a physician's office can improve hypertension care among a black patient population. Another project is testing the effectiveness of a multicomponent adherence promotion intervention among low-income blacks. It incorporates individual assessment and tailored feedback to help patients develop behavior management skills that enhance consistent medication use. Other studies are evaluating lifestyle adherence in blacks, and evaluating adherence to weight loss in black women.

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 material 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. Publications are available from the NHLBI public Web site or through the NHLBI online catalog. Below are some examples:

- *Control de la Presión Arterial Alta: Guía Para La Mujer de Edad Mayor*
- *Controlling High Blood Pressure: A Guide for Older Women* in English and Spanish
- *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.*

NHBPEP Coordinating Committee Activities

The organizations that belong to the NHBPEP coordinating committee have continuing education programs on the prevention and treatment of hypertension focusing on their minority members. They also support hypertension prevention and awareness in community-based settings such as screening, 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 among these populations.

Scientists are also interested in the protective effect of high-density lipoproteins (HDL). One study is focusing on isolating and characterizing native HDL species to determine their structure and function. Research findings may lead to new strategies to prevent and treat arteriosclerotic heart disease. Thirty-eight percent of the participants are minorities.

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, also will 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 Alaska Native People: Treat Your Heart to a Healthy Celebration*

Publications are available from the NHLBI public Web site or through the NHLBI online catalog.

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 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 the influence of these changes on ethnic difference in blood pressure regulation. Another project, using data from the NHGS, is examining CHD risk factors in black and white girls to identify genes involved in black-white differences in lipid metabolism and obesity.

Pregnancy is often associated with excess weight gain and postpartum weight retention that can lead to obesity. Understanding the determinants of pregnancy-associated weight gain and retention is the focus of a project being conducted within a predominantly black and Hispanic population of pregnant adolescents.

Prevention and Treatment

The NHLBI has initiated a program to prevent obesity in high-risk children.

- GEMS (see Chapter 11): Tests 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.

The Institute supports a number of investigator-initiated studies on the effectiveness of obesity prevention and control interventions among diverse populations. Black and Hispanic parents and children at Head Start sites are participating in a nutrition education and weight-control program; 70 percent of the participants will be minorities. Another study will test the effectiveness of a family-based intervention to prevent obesity in low-income Latino children.

A school-based study involving predominantly minority children is determining whether reducing the amount of time children spend watching television and videos and playing video games prevents obesity. 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. An ancillary study to an Institute-initiated program to reduce the decline in physical activity in adolescent girls (TAAG) is investigating the role of community characteristics (e.g., street design, access to public transportation, facilities for physical activity, population mix, and socioeconomic mix of the neighborhood) to physical activity levels and body mass index; approximately 50 percent of the girls are minority.

The Institute is supporting a weight loss maintenance trial to test the effectiveness of two strategies to promote the long-term maintenance of weight loss in adults who recently lost weight; about 40 percent of the population will be blacks. Another study will evaluate the effectiveness of diets of different macronutrient compositions to promote and sustain weight loss in adults; approximately 25 percent of the population will be black.

Black women are the subjects of a weight management program specifically tailored to their psychosocial, sociocultural, and health perspectives and life circumstances. A study, using data from the NHANES III, seeks to determine whether multiple perceptions and behaviors related to weight loss cluster according to sociodemographic characteristics. Research findings may lead to the design of culturally sensitive intervention strategies for minorities. Blacks and Mexican-Americans at various SES levels constituted the major portion of the population surveyed.

Education

The NHLBI OEI (see Chapter 2) has prepared health information on losing excess weight targeted to minorities.

- *Watch Your Weight* in English and Spanish
- *Embrace Your Health! Lose Weight if You Are Overweight*

Publications are available from the NHLBI public Web site or through the NHLBI online catalog.

Physical Inactivity

The Institute has initiated research on the effectiveness of intervention programs to encourage greater physical activity within selected groups.

- TAAG (see Chapter 11): Tests the effectiveness of school-community linked interventions to reduce the decline in physical activity in adolescent girls, from grades 6 through 8. Of 3,600 girls from 36 schools, approximately 30 percent will be minorities.

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. Adolescent girls are the focus of a number of projects that seek to determine the optimal amount of exercise required for primary prevention of CHD, provide culturally relevant physical activities, enhance social support for exercise, and test the effects of different amounts and intensities of physical activity on CVD risk factors. Hispanic women and women with low SES and literacy skills are subjects in two intervention projects to encourage sustained increases in physical activity among sedentary and

underserved groups. One of the projects is also seeking to determine the degree of generalization of activity from wife to husband and mother to child.

Education

The Institute has prepared the publications listed below 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!*

Publications are available through the NHLBI public Web site or from the NHLBI online catalog.

Smoking

The Institute supports a number of investigator-initiated smoking intervention and follow-up cessation maintenance studies that specifically target minorities. Two studies are directed toward minority pregnant women. One is evaluating the effectiveness of a smoking cessation program for pregnant smokers delivered as part of routine care by nurses. The other is bringing together prenatal care providers with researchers to assess the effectiveness of three programs to reduce smoking among pregnant women; a significant portion of the participants are black or Hispanic.

Investigators also are evaluating the effectiveness of two 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.

Other projects being supported include a study to assess the extent of smoking onset and cessation in minority youths, identify determinants of smoking onset, and determine predictors of cessation; a study of elderly smokers (40 percent minority) to evaluate the effectiveness of three smoking cessation strategies; and an intervention study tailored to an underserved population at risk for smoking relapse, smoking onset, and smokeless tobacco use.

Education

The Institute has prepared the following publications on smoking cessation for minorities.

- *Kick the Smoking Habit* in English and Spanish
- *Refresh Yourself! Stop Smoking*
- *American Indian and Alaska Native People: Help Your Heart*

Publications are available from the NHLBI public Web site or through the NHLBI online catalog.

Psychosocial Factors

The NHLBI has initiated research on the impact of depression, anxiety, and lack of social support on prognosis after a CHD event.

- ENRICHD (see Chapter 11): Determined the effects of psychosocial interventions on morbidity and mortality in post-MI patients who were depressed and socially isolated and/or who perceived themselves as lacking support from family and friends; 34 percent of the participants are minorities.

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 in the etiology, pathogenesis, and course of CHD.

Investigators are also interested in the effects of race and psychosocial factors, such as hostility, on glucose metabolism. A study was initiated to study 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 focus include the genetic basis of aggression and the relationships between behavioral risk-promoting variables (psychosocial stress, smoking, poor diet, physical inactivity); presumed mediating variables (sympathetic nervous system activity and insulin metabolism); and CHD risk factors; 50 to 65 percent of the population within these projects are black or Hispanic.

Ischemic Heart Disease

The NHLBI supports a major multicenter program involving basic and clinical research on ischemic heart disease in blacks.

- Ischemic Heart Disease in Blacks (see Chapter 9): Elucidates the pathophysiological basis for excess morbidity and mortality from ischemic heart disease in blacks, and subsequently develops therapeutic strategies to address these problems.

Diabetes

Blacks, Hispanics, and American Indians have a high prevalence of diabetes. The NHLBI supports research to elucidate the pathogenic mechanisms involved in the relationship between diabetes mellitus and elevated risk for CVD.

Several investigator-initiated studies are examining the genetic relationships between noninsulin-dependent diabetes mellitus (NIDDM) and atherosclerosis. They include a study among two sets of Hispanic families with NIDDM, one with CHD and one without; a study in Mexican-Americans to determine common genes linking insulin resistance and coronary artery disease; a project in Japanese-American families to characterize the genetic epidemiology of CHD risk factors (high LDL, risk factors that characterize the insulin resistance syndrome and NIDDM, and lipoprotein(a) levels and apo-lipoprotein(a) phenotypes); and a project in blacks and Hispanics to examine genetic determinants of insulin resistance and visceral adiposity as intermediate components in the pathways that lead to type 2 diabetes and atherosclerosis.

In addition, the Institute supports research on the role of hyperglycemia and insulin resistance in the development of vascular disease. A study in American Indians with NIDDM is seeking to elucidate the underlying biological processes and their interaction in the acceleration of atherogenesis. A project in a diverse diabetic patient population of blacks, whites, and Hispanics with and without carotid atherosclerosis is seeking to understand the atherogenicity of hypertriglyceridemia in diabetes by focusing on the size and number of triglyceride-rich lipoproteins.

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.

Other investigator-initiated studies on diabetes and CVD risk among minority populations include a survey to compare the prevalence of diabetes and CVD risk factors among native Mexicans and Mexican-Americans and a study among blacks, whites, and Hispanics with existing insulin resistance, including impaired glucose tolerance and NIDDM, to identy dietary factors that may contribute to elevated risk for CVD.

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): Evaluates the benefits of different therapies to reduce CVD in type 2 diabetes; 33 percent of the participants are minorities.
- BARI 2D (see Chapter 9): Evaluates 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, determines if insulin-providing drugs offer advantages or risks compared to insulin-sensitizers (drugs that enhance insulin action); 33 percent of the participants will be from minority populations.
- SANDS (see Chapter 9): Compares 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.

Lung Diseases

The NHLBI supports research on a number of lung diseases, such as asthma, sarcoidosis, and TB, that disproportionately affect minorities. The following section provides examples of research to address health disparities in lung diseases.

Asthma

Etiology and Pathophysiology

Asthma is a chronic lung disease characterized by inflammation of the airways. Various genetic and environmental factors contribute to the severity of symptoms. The Institute has launched a collaborative program to investigate the mechanistic basis for severe asthma and to determine how it differs from mild-to-moderate asthma.

The NHLBI is supporting a number of investigator-initiated projects on the etiology and pathophysiology of asthma. Two studies are using genomic screening to search for the genetic basis of asthma, one in a large sample of Asian siblings who are already known to differ widely in their airway responsiveness (sensitivity to histamine) and lung function and another in a homogeneous Hispanic population in Costa Rica.

Other projects are focusing on understanding the mechanisms by which environmental factors trigger the onset of asthma. One study is investigating the role of viruses in the exacerbation of asthma; 50 percent of the participants are minorities. Another is examining how pulmonary infection caused by mycoplasma pneumoniae exacerbates asthma and prolongs abnormalities in lung function; 40 percent of the participants are minority. A third study is seeking to understand the role of gene-environment interactions in the development of immune responses in a pediatric population that is genetically predisposed to asthma; 40 percent of the participants are Hispanic.

Occupational or environmental induced asthma is a major problem, especially among low-income, urban blacks and Hispanics. The NHLBI is supporting a project to examine work-related asthma in those populations.

Circadian change in airway function is an important aspect of asthma; more than 70 percent of deaths and 80 percent of respiratory arrests occur during sleep. Researchers are investigating the mechanisms that cause the changes in airway function in nocturnal asthma that lead to exacerbation of symptoms; 36 percent of the participants are minority.

Treatment and Control

The Institute has initiated research to identify optimal drug strategies for treatment and management of asthma. Because the disorder disproportionately affects minority children, it is important for them to be well represented in clinical trials.

- ACRN (see Chapter 9): Established 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): Determined that 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): Established a network of pediatric clinical care centers to determine optimal treatment and management strategies for children with asthma. The study 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): Establishes 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 an investigator-initiated study on the effect of steroids on enhanced alpha-adrenergic vascular responsiveness in asthma; 77 percent of the participants are minority.

Translational Activities

Ensuring full use of modern asthma treatment strategies is an important goal of the NHLBI. An investigator-initiated study, conducted in black communities in Baltimore, is examining the effectiveness of two asthma interventions to reduce emergency room visits, improve adherence to medication schedules, and lower asthma morbidity. One strategy provides assistance to families in accessing medical care; the other combines this assistance with a family intervention to encourage consistent

use of asthma medication. Another study examines whether shared decision-making between patient and physician in choosing asthma therapy improves adherence; 82 percent of the participants are minority.

A New York City-based study is establishing a collaboration between school nurses and primary care physicians to form a network of care focused on prevention of asthma attacks. The project seeks to identify school children with asthma and work with their families and physicians to develop an asthma management plan that includes supervision of drug treatment at school. The project is referring children who lack continuing care to physicians who follow the NAEPP Guidelines.

In San Diego, scientists are evaluating an intervention project to reduce tobacco-related morbidity among low SES Hispanic children with asthma. By collaborating with Hispanic counselors, researchers have developed a behavioral program that seeks to reduce environmental tobacco smoke (ETS) exposure in children with asthma.

In Ohio, investigators are testing the effects of reducing indoor ETS on asthma symptoms, pulmonary function, airway inflammation, and health services use; 44 percent of the participants are minorities.

Another ETS intervention program is being tested among predominately low SES black and Hispanic children in Los Angeles. Researchers are evaluating the effectiveness of two low-cost interventions (one involving counseling and booster telephone calls, and the other involving a video and household reminder kit) to reduce asthma morbidity.

In St. Louis, a randomized controlled trial is being conducted among 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.

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 asthma: cómo controlar esta enfermedad*

Publications are available from the NHLBI public Web site or through the NHLBI online catalog.

Chronic Lung Disease in Premature Infants

The NHLBI supports research on prevention of chronic lung disease (bronchopulmonary dysplasia) in preterm infants.

- Inhaled Nitric Oxide (NO) for the Prevention of Chronic Lung Disease (CLD) (see Chapter 9): Determines if low-dose inhaled NO will reduce CLD in premature newborns (gestational age less than 34 weeks and birth weight between 500 and 1250 grams at birth) with respiratory failure that required mechanical ventilation in the first 48 hours of life; 27 percent of the infants will be from minority populations.
- Inhaled Nitric Oxide in Prevention of Chronic Lung Disease (see Chapter 9): Investigates whether low-dose inhaled NO administered to preterm infants between 500 and 1250 grams birth weight who continue to require mechanical ventilation at 10 days of age increases survival without CLD at 36 weeks postmenstrual age; 55 percent of the infants will be from minority populations.

Sarcoidosis

Sarcoidosis is an inflammatory disease of unknown etiology that affects the lungs. Institute-initiated research includes:

- Sarcoidosis Genetic Linkage Consortium (see Chapter 9): Identifies genes linked to sarcoidosis susceptibility and determines how they interact with environmental risk factors to cause sarcoidosis; 100 percent of the participants are black.

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

The NHLBI supports research on the etiology, pathophysiology, and consequences of sleep-disordered breathing (SDB), a condition characterized by repetitive interruptions in breathing. Sleep apnea, a common disorder that disproportionately affects blacks, is associated

with an increased risk of CVD, and is particularly prevalent in heart failure patients. An Institute-initiated program is developing new approaches to measure the interrelationship between sleep disorders and heart, lung, and blood diseases. One study will examine the interrelationship between sleep apnea and heart failure and the mechanisms leading to cardiovascular stress when the two occur together.

The Institute also supports a wide spectrum of investigator-initiated projects to elucidate cardiovascular and other health consequences of SDB. Ongoing studies of SDB in various community settings are assessing its health risks 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.

Treatment strategies for SDB are another area of interest. A multisite clinical trial was initiated 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.

Tuberculosis

Beginning in1993, the NHLBI funded five annual competitions for Tuberculosis Academic Awards (TBAAs). The broad goal of the TBAA program was to improve prevention, management, and control of TB by supporting increased opportunities for health-care practitioners to learn modern principles and practices. The TBAA program promoted coordinated clinical approaches to the care of patients of various ethnic backgrounds who have TB; raised awareness among health care providers of unique ethnic cultural, and socioeconomic dimensions of TB; focused educational efforts in areas where TB incidence is persistently high (e.g., immigrant communities, refugee centers, homeless shelters, correctional facilities); promoted development of minority faculty capable of providing appropriate instruction in diagnosis and management of TB; and enhanced TB education programs in minority medical schools and in the communities they serve. The program ended in 2002.

Building on the foundation laid by the TBAA program, the NHLBI funded a contract in 2003 for a TB Curriculum Coordinating Center to provide access to the best TB educational and training opportunities in the United States. The program is directed to medical schools, nursing schools, and allied health schools—especially those that provide primary care to communities where TB is endemic and the population is at high risk.

In 2001, the Institute initiated a program on Genetic Aspects of Tuberculosis in the Lung. Four of the 10 awards were given to institutions conducting genetic studies in humans to characterize genes associated with TB susceptibility and host immune responses to infection. A large number of the participants are being recruited from minority populations.

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 population in order to aid development of anti-TB vaccines. Another group will conduct 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.

The NHLBI also supports research to improve TB control among minority populations. One project is evaluating educational strategies to improve adherence to medication regimes and regular clinic visits among TB-infected adolescents in California. The program, based in San Diego, is specifically directed towards Hispanic adolescents. 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.

Blood Diseases

Sickle Cell Disease

SCD is an inherited blood disorder that produces chronic anemia, end organ damage, and periodic episodes of pain. 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 uncover better approaches for its diagnosis and treatment and for prevention of complications.

- Comprehensive Sickle Cell Centers Program (see Chapter 9): Provides a multidisciplinary and multilevel research approach to expedite development and application of new knowledge for improved diagnosis and treatment of SCD and prevention of its complications.

Basic Research

Basic research often uncovers new clues that lead to the development of improved therapies. Recent findings from research on coagulation and vascular systems have suggested new targets to pursue in the development of potential therapeutic agents to alleviate chronic painful episodes linked to SCD.

The NO pathway for modulation of blood flow has become another area of focus. In a recent advance, researchers have linked the premature destruction of red blood cells in SCD with release of free hemoglobin into blood, which leads to reduced NO activity and blood vessel blockage. This observation identifies the root causes of vessel blockage in SCD patients and may reveal new molecules and processes to pursue. It also suggests therapies to restore NO activity in the body may prove beneficial for patients with SCD.

Gene transfer and therapy research continues as an approach to finding a cure for SCD patients. Under NHLBI support, this technically difficult work is actively pursued by researchers throughout the United States.

Another area of concentration is developing improved drugs to induce fetal hemoglobin. Hydroxyurea does not benefit all patients. In 2003, the NHLBI released two initiatives, Mechanisms of Fetal Hemoglobin Gene Silencing for Treatment of Sickle Cell Disease and Cooley's Anemia and Chemical Screen for New Inducers of Fetal Hemoglobin, as part of an ongoing strategic plan for a gene-based cure for beta chain hemoglobinopathies.

The NHLBI continues to support the Reference Laboratory to Evaluate Therapies for SCD, which uses a battery of standardized tests for preclinical evaluation of potential new therapeutic agents for SCD.

In 2003, several published papers concerning the genetic component of stroke in SCD indicated that stroke events, as well as cerebral vasculopathy, occur in families. This strengthens the rationale for identifying genetic factors that predispose a patient to stroke in 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): Seeks 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 are black.
- BABY HUG (see Chapter 11): Determines the effectiveness of hydroxyurea in preventing onset of chronic organ damage in young black children with end-stage sickle cell anemia.
- STOP 2 (see Chapter 9): Optimizes primary prevention treatment strategy proven effective in STOP 1 in a minority pediatric population.

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 material, and informed consent documents in Spanish, Japanese, Korean, Chinese, and Vietnamese. In addition, focus groups have been held to identify barriers to participation.

- Cord Blood Stem Cell Transplantation Study (COBLT) (see Chapter 11): Determines whether umbilical cord blood (UBC) can substitute for marrow in children with leukemia who need a transplant; approximately 57 percent of the cord blood units are from minority donors. In FY 2003, 63 Hispanics and 17 Asian Americans received a transplant through the COBLT study—19 percent of the total transplants performed.

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 have been transplanted with sibling cord blood for SCD or thalassemia showed that matched sibling cord blood transplantation offers the potential for a cure.

- Sibling Donor Cord Blood Banking and Transplantation (see Chapter 9): Establishes a cord blood bank for collecting sibling donor cord blood in families that currently have a child with sickle cell anemia or thalassemia. Investigators will evaluate the safety and effectiveness of matched sibling cord blood transplantation for treatment of children with SCD or thalassemia. A majority of the participants are black.

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 (IBMTR) to collect data on demographics and outcome of patients with sickle cell anemia who have received a blood or marrow transplant. Recognizing that the registry by itself may not be sufficient to instill a sense of collaboration among investigators, the Institute, with support from the NIH Office of Rare Diseases, recently sponsored a meeting to bring together transplant investigators to review data collected by the IBMTR and to develop a systematic plan to sustain an infrastructure for collaboration among U.S. centers treating and transplanting patients with sickle cell anemia.

Additional clinical transplantation research is conducted through the Blood and Marrow Transplant Clinical Trials Network (BMT CTN), a joint effort with the National Cancer Institute. This network will promote the efficient comparison of novel treatment methods and management strategies for patients undergoing blood or marrow transplantation. It has developed strategies and has implemented procedures to enroll patients from minority groups.

The life span of individuals with SCD has increased due to the significant improvement in available treatment modalities. However, the increased longevity has raised quality-of-life issues and psychosocial problems for patients—nonmedical issues (e.g., social, family, work environment, health insurance) that arise from living with SCD as a chronic disease. To address the issues, the NHBLI recently supported two meetings on quality-of-life concerns for adults with SCD. The first meeting brought together consumers affected by SCD (patient, families, health care personnel), and the second assembled researchers with psychosocial expertise. Both worked toward the goal of developing, testing, and implementing a psychometrically sound sickle cell-specific quality-of-life questionnaire that can be used in research and clinical settings. The ultimate objective is to create a comprehensive care model of SCD.

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*

Publications are available from the NHLBI public Web site or through the NHLBI online catalog.

Cooley's Anemia

Cooley's anemia is an inherited disorder of the red blood cell 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.

- Thalassemia (Cooley's Anemia) Clinical Research Network (see Chapter 11): Establishes 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 to enhance fetal hemoglobin production (hydroxyurea and butyrate), investigation of gene therapy approaches to cure the disease, prevention of bone diseases, optimum treatment of hepatitis, treatment of heart

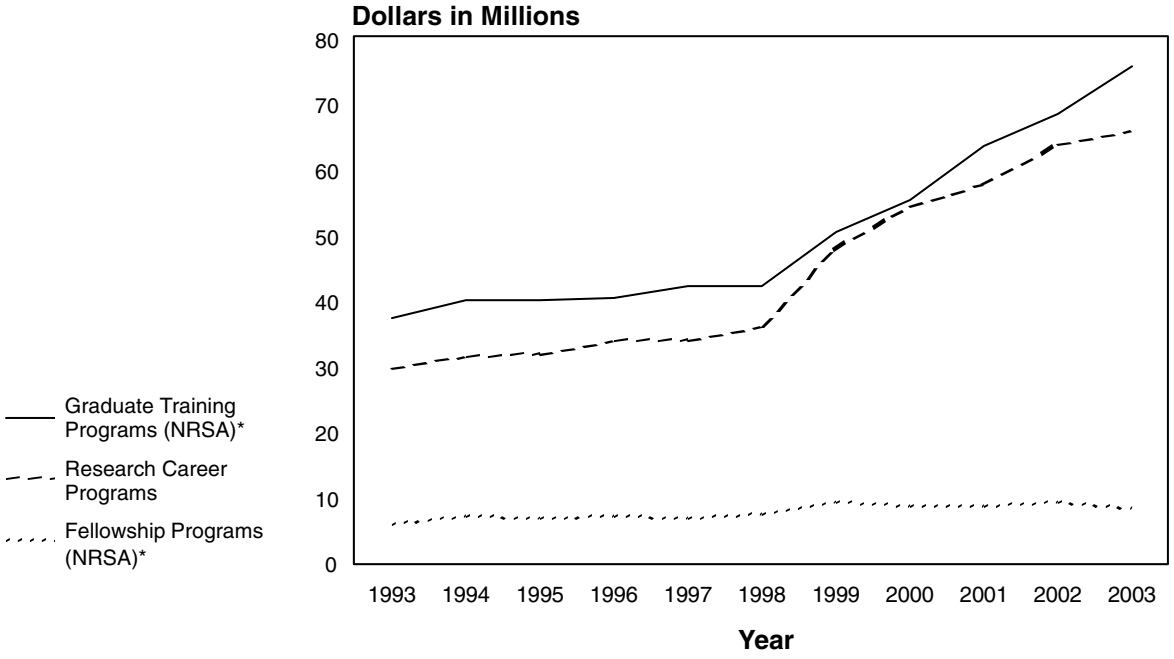
disease and iron overload, noninvasive ways of measuring iron burden, and efforts to improve the safety of the Nation's blood supply.

Women's Health Initiative

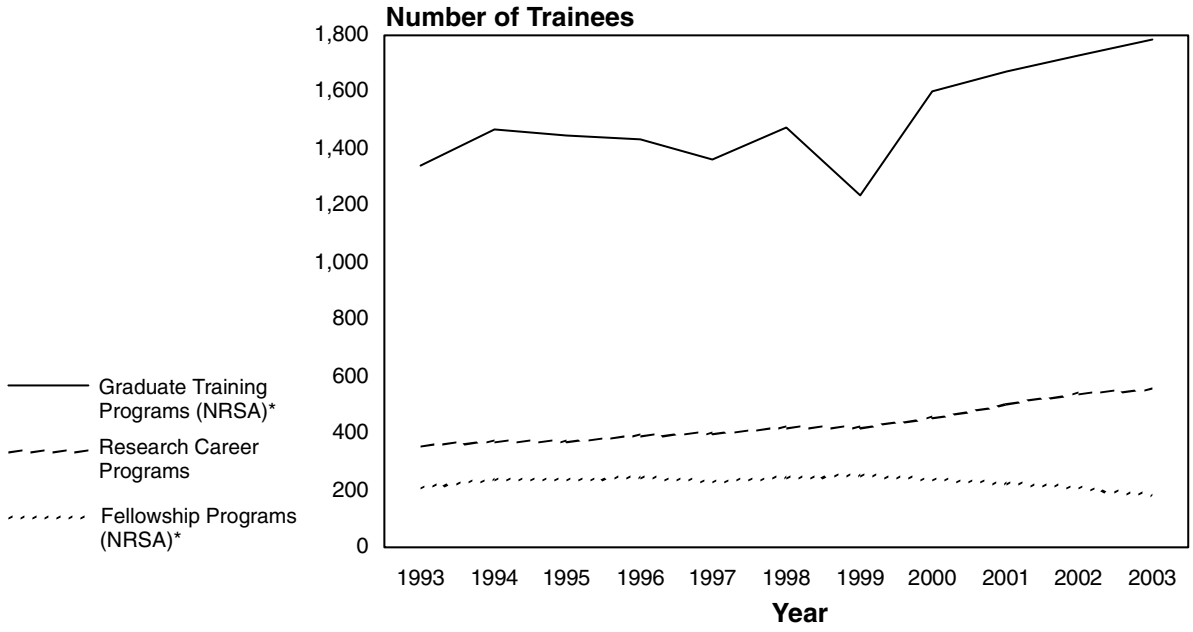
Coronary heart disease, cancer, and osteoporosis are the most common causes of death, disability, and impaired quality of life in postmenopausal women. The WHI (see Chapters 2 and 11) seeks to answer questions on benefits and risks of HT, changes in dietary patterns, and calcium/vitamin D supplements in disease prevention. Several of the centers have recruited primarily minority populations: blacks, Hispanics, Asian Americans, Pacific Islanders, and American Indians. The Clinical Trial recruited 12,607 minorities and the Observational Study 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 1993–2003



NHLBI Full-Time Training Positions: Fiscal Years 1993–2003



* 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 2003

	Number of Awards Obligated	Trainees (Full-time Training Positions)	Direct Cost	Indirect Cost	Total Cost	Percent of Total NHLBI Training Program Dollars
Fellowship Programs						
Fellowship Programs						
Predoctoral Fellowship Award (F31)	19	19	$ 562,958	$ —	$ 562,958	0.7%
Individual NRSA (F32)	164	164	7,867,728	—	7,867,728	9.4
Senior Fellowships NRSA (F33)	2	2	112,616	—	112,616	0.1
Subtotal, Fellowships	185	185	8,543,302	—	8,543,302	10.2
Graduate Training Programs						
Institutional NRSA (T32)	214	1,542	64,804,679	5,146,036	69,950,715	83.2
Minority Institutional NRSA (T32)	6	42	919,348	86,432	1,005,780	1.2
Off-Quarter Professional Student Training NRSA (T34, T35	16	93	1,817,327	157,735	1,975,062	2.3
Short-Term Training for Minority Students (T35M)	32	107	2,382,465	211,978	2,594,443	3.1
Subtotal, Graduate Training Programs	268	1,784	69,923,819	5,602,181	75,526,000	89.9
Total, Training Programs	**453**	**1,969**	**$78,467,121**	**$5,602,181**	**$84,069,302**	**100.0%**

* Excludes assessment of $1,716,000.

History of Training Obligations by Activity: Fiscal Years 1993–2003

	Dollars (Thousands)										
	1993	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Fellowship Programs											
Predoctoral Fellowship Award (F31)	$ 97	$ 199	$ 304	$ 551	$ 388	$ 466	$ 346	$ 248	$ 264	$ 478	$ 563
Individual NRSA (F32)	5,867	6,853	6,651	6,483	6,281	6,969	8,807	8,517	8,515	8,887	7,868
Senior Fellowships NRSA (F33)	141	99	99	233	179	125	90	92	147	84	112
Intramural NRSA (F35)	70	69	49	—	—	—	—	—	—	—	—
Subtotal, Fellowships	6,175	7,220	7,103	7,267	6,848	7,560	9,243	8,857	8,926	9,449	8,543
Graduate Training Programs											
Institutional NRSA (T32)	34,846[A]	36,534[B]	36,270[C]	36,718[D]	38,253[E]	37,904[F]	45,551[G]	50,507[H]	58,516[I]	62,999[J]	69,951[K]
Minority Institutional NRSA (T32)	35	735	982	679	898	706	901	1,167	996	1,092	1,006
Off-Quarter Professional Student Training NRSA (T34, T35)	1,744	1,132	951	1,001	1,216	1,435	1,384	966	1,974	1,987	1,975
MARC (T36)	15	5	5	5	5	5	5	5	5	—	—
Short-Term Training for Minority Students (T35M)	573	1,616	1,760	1,834	1,612	1,964	2,494	2,570	1,877	2,057	2,594
Subtotal, Training Grants	37,213	40,022	39,968	40,237	41,984	42,014	50,335	55,215	63,368	68,135	75,526
Total, Training Programs	**$43,388[A]**	**$47,242[B]**	**$47,071[C]**	**$47,504[D]**	**$48,832[E]**	**$49,574[F]**	**$59,578[G]**	**$64,072[H]**	**$72,294[I]**	**$77,585[J]**	**$84,069[K]**

A Excludes Assessment of $888,000.
B Excludes Assessment of $864,000.
C Excludes Assessment of $964,000.
D Excludes Assessment of $982,000.
E Excludes Assessment of $1,004,000.
F Excludes Assessment of $1,032,000.
G Excludes Assessment of $1,216,000.
H Excludes Assessment of $1,280,000.
I Excludes Assessment of $1,424,000.
J Excludes Assessment of $1,584,000.
K Excludes Assessment of $1,716,000.

Full-Time Training Positions by Activity: Fiscal Years 1993–2003

Number of Positions

	Fiscal Year										
	1993	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Fellowship Programs											
Predoctoral Fellowship Award (F31)	4	7	13	21	15	19	13	11	12	18	19
Individual NRSA (F32)	200	229	222	220	210	225	237	225	208	194	164
Senior Fellowships NRSA (F33)	4	4	4	7	5	4	2	2	3	2	2
Intramural NRSA (F35)	3	2	2	—	—	—	—	—	—	—	—
Subtotal, Fellowships	211	242	241	248	230	248	252	238	223	214	185
Graduate Training Programs											
Institutional NRSA (T32)	1,124	1,237	1,201	1,216	1,179	1,423	1,185	1,368	1,425	1,482	1,542
Minority Institutional NRSA (T32)	1	30	47	30	43	52	53	48	43	39	42
Off-Quarter Professional Student Training NRSA (T34, T35)	181	100	76	78	68	—	—	51	109	179	93
Short-Term Training for Minority Students (T35M)	40	102	125	113	75	—	—	136	93	30	107
Subtotal, Training Grants	1,346	1,469	1,449	1,437	1,365	1,475	1,238	1,603	1,670	1,730	1,784
Total, Training Positions	**1,557**	**1,711**	**1,690**	**1,685**	**1,595**	**1,723**	**1,490**	**1,841**	**1,893**	**1,944**	**1,969**

NHLBI Research Career Programs: Fiscal Years 1993–2003

Number of Awards

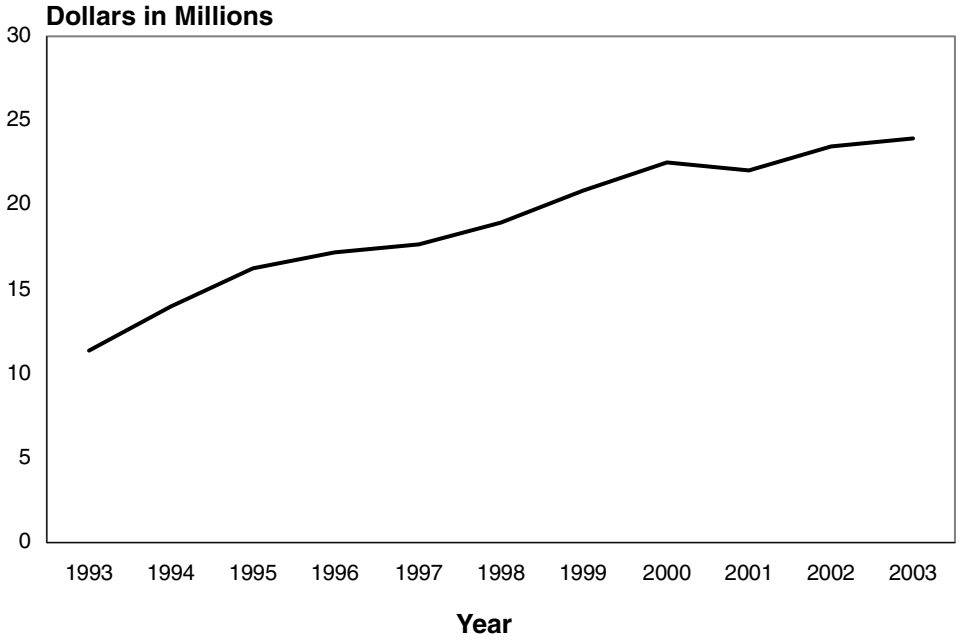
	Fiscal Year										
	1993	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Mentored Research Scientist Development Award for Minority Faculty (K01)	—	—	—	—	5	19	30	29	44	54	47
Minority Institution Faculty Mentored Research Scientist Development Award (K01)	—	—	—	—	1	—	—	11	9	2	7
Mentored Scientist Development Award in Research Ethics (K01)	—	—	—	—	—	—	—	—	—	—	2
Independent Scientist Award (K02)	—	—	—	3	8	14	18	27	34	33	32
Research Career Development Award (K04)	40	34	30	25	18	10	6	1	—	—	—
Research Career Award (K06)	6	3	3	3	3	3	2	2	2	2	2
Preventive Cardiology Academic Award (K07)	14	11	7	—	—	—	—	—	—	—	—
Preventive Pulmonary Academic Award (K07)	11	8	4	—	—	—	—	—	—	—	—
Transfusion Medicine Academic Award (K07)	12	9	5	2	—	—	—	—	—	—	—
Systemic Pulmonary and Vascular Disease Academic Award (K07)	11	11	15	11	9	3	3	1	—	—	—
Asthma Academic Award (K07)	3	6	9	9	9	6	3	—	—	—	—
Tuberculosis Academic Award (K07)	6	12	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
Clinical Investigator Development Award (K08)	180	208	222	254	267	278	262	257	241	236	240
Physician Scientist Award (K11)	60	46	22	12	—	—	—	—	—	—	—
Minority School Faculty Development Award (K14)	15	12	11	15	9	—	—	4	1	—	—
Research Development Award for Minority Faculty (K14)	—	13	28	36	34	37	22	7	—	—	—
Career Enhancement Award for Stem Cell Research (K18)	—	—	—	—	—	—	—	—	—	—	1
Mentored Patient-Oriented Research Career Development Award (K23)	—	—	—	—	—	—	13	36	58	90	110
Midcareer Investigator Award in Patient-Oriented Research (K24)	—	—	—	—	—	—	11	20	27	37	38
Mentored Quantitative Research Career Development Award (K25)	—	—	—	—	—	—	—	—	2	7	9
Clinical Research Curriculum Award (K30)	—	—	—	—	—	—	9	16	55	55	55
Total, Research Career Programs	**358**	**373**	**371**	**397**	**398**	**420**	**422**	**459**	**509**	**543**	**552**

NHLBI Research Career Program Obligations: Fiscal Years 1993–2003

Dollars (Thousands)

	Fiscal Year										
	1993	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Mentored Research Scientist Development Award for Minority Faculty (K01)	$ —	$ —	$ —	$ —	$ 460	$ 1,723	$ 2,738	$ 3,650	$ 5,556	$ 5,711	$ 6,156
Minority Institution Faculty Mentored Research Scientist Award (K01)	—	—	—	—	106	101	905	1,300	1,143	1,703	991
Mentored Scientist Development Award in Research Ethics (K01)	—	—	—	—	—	—	—	—	—	—	255
Independent Scientist Award (K02)	—	—	—	207	545	933	1,548	2,350	3,202	3,130	3,099
Research Career Development Award (K04)	2,595	2,224	2,006	1,693	1,226	684	568	69	—	—	—
Research Career Award (K06)	194	102	104	105	103	103	70	70	70	69	69
Preventive Cardiology Academic Award (K07)	1,801	1,397	957	—	—	—	—	—	—	—	—
Preventive Pulmonary Academic Award (K07)	1,040	726	309	—	—	—	—	—	—	—	—
Transfusion Medicine Academic Award (K07)	1,155	868	485	326	—	—	—	—	—	—	—
Systemic Pulmonary and Vascular Diseases Academic Award (K07)	1,820	1,863	2,295	1,715	1,415	386	423	113	—	—	—
Asthma Academic Award (K07)	233	502	749	740	764	509	248	—	—	—	—
Tuberculosis Academic Award (K07)	454	906	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
Clinical Investigator Development Award (K08)	14,125	16,635	18,090	21,093	22,238	23,122	29,741	30,189	29,263	29,295	30,288
Physician Scientist Award (K11)	5,110	3,993	1,903	1,023	—	—	—	—	—	—	—
Minority School Faculty Development Award (K14)	1,081	893	810	1,158	729	618	445	862	98	—	—
Research Development Award for Minority Faculty (K14)	—	1,289	2,812	3,607	3,468	3,099	2,093	393	—	—	—
Career Enhancement Award for Stem Cell Research (K18)	—	—	—	—	—	—	—	—	—	—	243
Mentored Patient-Oriented Research Career Development Award (K23)	—	—	—	—	—	—	1,687	4,619	7,570	11,909	14,571
Midcareer Investigator Award in Patient-Oriented Research (K24)	—	—	—	—	—	—	1,054	2,072	2,877	4,058	4,368
Mentored Quantitative Research Career Development Award (K25)	—	—	—	—	—	—	—	—	272	921	1,195
Clinical Research Curriculum Award (K30)	—	—	—	—	—	—	1,772	3,163	3,073	3,090	3,110
Total, Research Career Program Obligations	**$29,608**	**$31,398**	**$31,675**	**$33,862**	**$33,912**	**$36,069**	**$47,670**	**$54,184**	**$57,470**	**$63,514**	**$65,817**

NHLBI Minority Biomedical Research Training, Career Development, and Research Supplements Program Obligations: Fiscal Years 1993–2003



NHLBI Minority Biomedical Research Training, Career Development, and Research Supplements Program Obligations: Fiscal Years 1993–2003

	Dollars (Thousands)										
	Fiscal Year										
	1993	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
MARC Summer Research Training Program	$ 48	$ 31	$ 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
MARC	—	—	—	5	5	5	—	5	5	—	—
Minority Biomedical Research Support (MBRS)	2,540	2,433	2,313	2,503	2,722	2,978	3,423	3,873	3,165	2,793	3,600
Minority Institution Faculty Mentored Research Scientist Development Award	—	—	—	—	106	101	905	1,300	1,143	1,703	991
Minority Institution Research Training Program	741	735	982	679	898	706	901	1,167	996	1,092	1,006
Minority Predoctoral Fellowship	114	199	304	551	388	436	345	248	264	278	308
Minority Research Supplements Program	6,273	6,754	7,265	6,714	7,070	7,043	7,440	8,304	8,587	9,822	9,323
Minority School Faculty Development Award	1,081	893	810	1,158	729	618	445	862	98	—	—
Reentry Supplements	—	—	—	140	152	249	106	176	384	—	—
Research Development Award for Minority Faculty	—	1,289	2,812	3,607	3,468	3,099	2,093	393	—	—	—
Short-Term Training for Minority Students	573	1,616	1,760	1,834	1,612	1,964	2,494	2,570	1,876	2,057	2,594
Total, Minority Programs	**$11,370**	**$13,950**	**$16,274**	**$17,223**	**$17,627**	**$18,922**	**$20,900**	**$22,552**	**$22,095**	**$23,471**	**$23,982**

NHLBI Research Supplements Program by Award Type: Fiscal Years 1993–2003

Number of Awards

	Fiscal Year										
	1993	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Minority Supplements											
Investigator	51	46	49	42	38	31	32	33	33	46	47
Postdoctoral	29	31	39	49	47	50	47	42	41	33	38
Graduate	45	55	42	37	36	48	53	47	43	45	57
Undergraduate	20	35	27	12	23	25	17	19	12	17	18
High School	5	15	10	8	9	11	6	—	3	3	4
Post-Master/Post-Baccalaureate	—	—	—	—	—	—	—	—	—	2	8
Reentry Supplements	—	—	—	2	2	3	2	1	3	—	—
Disability Supplements	—	8	4	3	3	2	1	5	4	5	4
Total, Research Supplements Program	**150**	**190**	**171**	**153**	**158**	**170**	**158**	**147**	**139**	**151**	**176**

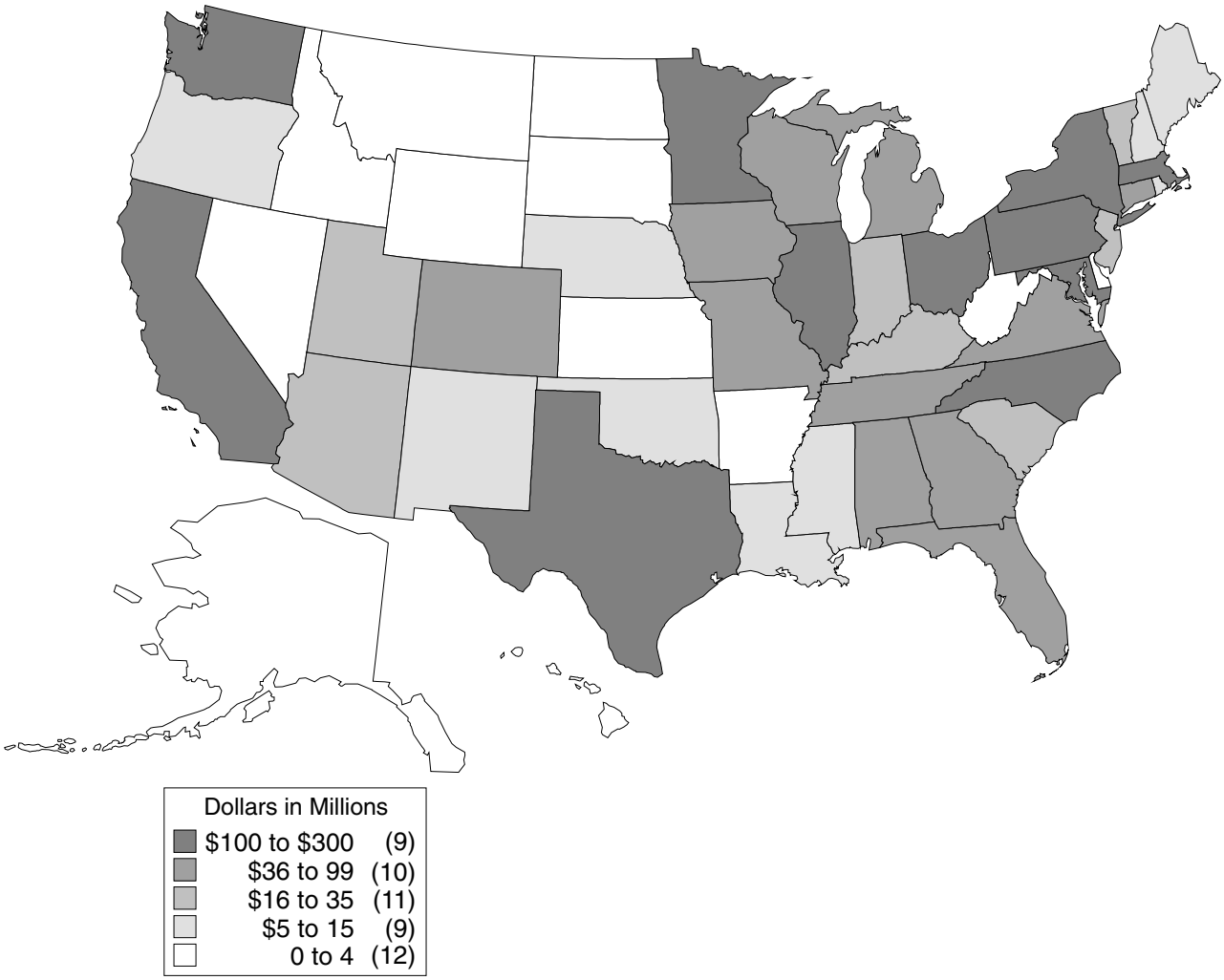
NHLBI Research Supplements Program Obligations by Award Type: Fiscal Years 1993–2003

Dollars (Thousands)

	Fiscal Year										
	1993	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Minority Supplements											
Investigator	$3,270	$2,894	$3,319	$2,552	$2,412	$2,185	$2,331	$3,262	$3,430	$5,046	$3,844
Postdoctoral	1,574	1,882	2,153	2,899	3,172	3,032	3,110	3,053	3,086	2,554	2,655
Graduate	1,263	1,585	1,402	1,116	1,181	1,527	1,806	1,791	1,818	1,864	2,181
Undergraduate	150	332	351	120	273	246	166	198	235	260	301
High School	16	61	40	27	32	53	27	—	18	33	33
Post-Master/Post-Baccalaureate	—	—	—	—	—	—	—	—	—	65	309
Reentry Supplements	—	—	—	140	152	249	106	176	384	—	—
Disability Supplements	—	357	277	194	165	96	72	282	187	474	360
Total, Research Supplements Program	**$6,273**	**$7,111**	**$7,542**	**$7,048**	**$7,387**	**$7,388**	**$7,618**	**$8,762**	**$9,158**	**$10,296**	**$9,683**

14. Geographic Distribution of Awards: Fiscal Year 2003

Geographic Distribution of Awards by State: Fiscal Year 2003



Geographic Distribution of Awards by State or Country: Fiscal Year 2003

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Alabama								
Auburn University at Auburn	2	225,170	1	178,750	1	46,420	—	—
CFD Research Corporation	1	444,565	1	444,565	—	—	—	—
Gem Pharmaceuticals, Inc.	1	278,764	1	278,764	—	—	—	—
Tuskegee University	1	24,000	1	24,000	—	—	—	—
University of Alabama at Birmingham	74	28,082,360	64	23,773,654	5	1,212,560	5	3,096,146
University of South Alabama	10	4,048,936	10	4,048,936	—	—	—	—
Total Alabama	**89**	**33,103,795**	**78**	**28,748,669**	**6**	**1,258,980**	**5**	**3,096,146**
Arizona								
Arete Associates	1	425,604	1	425,604	—	—	—	—
Arizona State University	4	1,182,669	4	1,182,669	—	—	—	—
Carl T. Hayden VA Medical Center	1	225,000	1	225,000	—	—	—	—
Intrinsic Bioprobes, Inc.	2	550,761	2	550,761	—	—	—	—
Mayo Clinic Scottsdale	3	1,044,500	3	1,044,500	—	—	—	—
St. Joseph's Hospital and Medical Center	1	308,558	1	308,558	—	—	—	—
University of Arizona	42	17,105,798	36	15,192,254	5	831,700	1	1,081,844
Total Arizona	**54**	**20,842,890**	**48**	**18,929,346**	**5**	**831,700**	**1**	**1,081,844**
Arkansas								
Arkansas Children's Hospital Research Institute	2	415,250	2	415,250	—	—	—	—
University of Arkansas for Medical Sciences, Little Rock	4	923,488	4	923,488	—	—	—	—
Total Arkansas	**6**	**1,338,738**	**6**	**1,338,738**	**—**	**—**	**—**	**—**
California								
Advanced Biomedical Monitoring, Inc.	3	1,693,472	3	1,693,472	—	—	—	—
Ansata Therapeutics, Inc.	1	240,894	1	240,894	—	—	—	—
Beckman Research Institute	4	2,651,209	4	2,651,209	—	—	—	—
Blaufuss Multimedia	1	98,612	1	98,612	—	—	—	—
Burnham Institute	9	2,880,829	8	2,834,409	1	46,420	—	—
California Institute of Technology	1	381,401	1	381,401	—	—	—	—
California State University, Northridge	—	110,795	—	110,795	—	—	—	—
California State University, Sacramento	1	132,000	1	132,000	—	—	—	—
Cedars-Sinai Medical Center	10	4,612,691	10	4,612,691	—	—	—	—
Cellerant Therapeutics, Inc.	1	100,000	1	100,000	—	—	—	—
Children's Hospital and Research Center at Oakland	14	8,974,183	12	8,738,516	2	235,667	—	—
Children's Hospital of Los Angeles	12	6,405,794	12	6,405,794	—	—	—	—
Children's Hospital of Orange County	1	39,807	—	—	1	39,807	—	—
Chimeric Technologies, Inc.	1	315,490	1	315,490	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Cytograft Tissue Engineering, Inc.	1	429,750	1	429,750	—	—	—	—
Diagnostics for the Real World	3	1,275,684	3	1,275,684	—	—	—	—
Dimx, Inc.	1	134,090	1	134,090	—	—	—	—
Fallbrook Engineering, Inc.	1	572,131	1	572,131	—	—	—	—
Functional Insect Genomics Institute	1	161,471	1	161,471	—	—	—	—
Gen-Probe, Inc.	1	2,469,071	—	—	—	—	1	2,469,071
Good Samaritan Hospital	3	776,680	3	776,680	—	—	—	—
Harbor-UCLA Research and Education Institute	10	3,509,264	8	2,682,425	—	—	2	826,839
House Ear Institute	1	333,500	1	333,500	—	—	—	—
HTD Biosystems, Inc.	1	99,693	1	99,693	—	—	—	—
Institute of Critical Care Medicine	1	175,971	1	175,971	—	—	—	—
Ichor Medical Systems	2	213,400	2	213,400	—	—	—	—
Irwin Memorial Blood Centers	1	357,063	1	357,063	—	—	—	—
Ischem Corporation	1	99,850	1	99,850	—	—	—	—
J. David Gladstone Institutes	13	7,499,538	12	7,453,118	1	46,420	—	—
Kaiser Foundation Research Institute	9	5,654,499	4	2,871,282	—	—	5	2,783,217
La Jolla Bioengineering Institute	1	408,656	1	408,656	—	—	—	—
La Jolla Institute for Experimental Medicine	2	777,375	2	777,375	—	—	—	—
LaunchPoint Technologies, LLC	1	370,076	1	370,076	—	—	—	—
LDM Associates	1	100,336	1	100,336	—	—	—	—
Loma Linda University	7	1,763,000	7	1,763,000	—	—	—	—
MedicalWorks, Inc.	1	315,044	1	315,044	—	—	—	—
Northern California Institute for Research and Education	7	5,281,323	7	5,281,323	—	—	—	—
Oncosis, Inc.	—	1,000,000	—	1,000,000	—	—	—	—
Palo Alto Institute for Research and Education, Inc.	1	223,200	1	223,200	—	—	—	—
Palo Alto Medical Foundation	2	1,203,084	2	1,203,084	—	—	—	—
Panorama Research, Inc.	1	98,007	1	98,007	—	—	—	—
Physical Optics Corporation	1	99,995	1	99,995	—	—	—	—
Polymer Technology Group, Inc.	1	100,000	1	100,000	—	—	—	—
Prizm Pharmaceuticals, Inc.	1	112,789	1	112,789	—	—	—	—
Pulmonetic Systems, Inc.	1	476,925	1	476,925	—	—	—	—
Rand Corporation	2	856,747	2	856,747	—	—	—	—
Salk Institute for Biological Studies	2	938,720	2	938,720	—	—	—	—
San Diego State University	8	5,157,277	8	5,157,277	—	—	—	—
Scripps Research Institute	40	21,254,738	35	20,208,845	5	1,045,893	—	—
SeQual Technologies, Inc.	1	99,081	1	99,081	—	—	—	—
Sidney Kimmel Cancer Center	3	1,359,675	3	1,359,675	—	—	—	—
SRI International	2	830,875	2	830,875	—	—	—	—
Stanford University	64	34,327,219	53	28,865,889	8	1,602,294	3	3,859,036
Steritech, Inc.	3	300,000	3	300,000	—	—	—	—
SurroMed, Inc.	1	92,655	1	92,655	—	—	—	—
University of California, Berkeley	5	1,596,890	4	1,331,248	1	265,642	—	—
University of California, Davis	29	9,310,643	28	8,388,860	—	—	1	921,783
University of California, Irvine	14	5,380,715	11	3,672,629	1	41,608	2	1,666,478

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
University of California, Lawrence Berkeley National Laboratory	12	5,072,369	11	4,780,847	1	291,522	—	—
University of California, Los Angeles	64	32,283,117	55	28,181,972	5	1,311,420	4	2,789,725
University of California, Riverside	3	881,484	3	881,484	—	—	—	—
University of California, San Diego	97	50,769,268	81	43,768,459	12	2,695,570	4	4,305,239
University of California, San Francisco	95	39,421,356	88	37,590,396	7	1,830,960	—	—
University of California, Santa Barbara	1	234,247	1	234,247	—	—	—	—
University of the Pacific	1	100,000	1	100,000	—	—	—	—
University of Southern California	24	9,159,288	23	9,105,344	1	53,944	—	—
Veterans Medical Research Foundation, San Diego	2	767,898	2	767,898	—	—	—	—
WebSciences International	1	551,075	1	551,075	—	—	—	—
Total California	**611**	**285,473,979**	**543**	**256,345,424**	**46**	**9,507,167**	**22**	**19,621,388**
Colorado								
Aerophase, Inc.	1	366,475	1	366,475	—	—	—	—
Colorado State University	2	615,710	2	615,710	—	—	—	—
Denver Health and Hospital Authority	1	915,645	1	915,645	—	—	—	—
Keystone Symposia	1	15,000	1	15,000	—	—	—	—
Kestrel Labs, Inc.	1	99,976	1	99,976	—	—	—	—
Myogen, Inc.	4	473,898	4	473,898	—	—	—	—
National Jewish Medical and Research Center	36	16,993,254	33	16,828,570	2	102,728	1	61,956
Rose Biomedical Development Corporation	1	377,073	1	377,073	—	—	—	—
Source Precision Medicine	1	161,668	1	161,668	—	—	—	—
TDA Research, Inc.	1	100,000	1	100,000	—	—	—	—
University of Colorado at Boulder	9	1,695,906	4	1,244,483	5	451,423	—	—
University of Colorado Health Sciences Center	65	23,437,451	57	21,929,814	8	1,507,637	—	—
Visible Productions, LLC	1	284,742	1	284,742	—	—	—	—
Total Colorado	**124**	**45,536,798**	**108**	**43,413,054**	**15**	**2,061,788**	**1**	**61,956**
Connecticut								
John B. Pierce Laboratory, Inc.	6	1,580,790	5	1,534,370	1	46,420	—	—
L2 Diagnostics, LLC	2	238,237	2	238,237	—	—	—	—
University of Connecticut, Storrs	1	178,750	1	178,750	—	—	—	—
University of Connecticut Health Center	16	6,893,577	16	6,893,577	—	—	—	—
US Nanocorp, Inc.	1	326,445	1	326,445	—	—	—	—
Wesleyan University	1	284,000	1	284,000	—	—	—	—
Yale University	69	30,246,611	59	24,801,133	8	2,098,042	2	3,347,436
Total Connecticut	**96**	**39,748,410**	**85**	**34,256,512**	**9**	**2,144,462**	**2**	**3,347,436**
Delaware								
Compact Membrane Systems, Inc.	1	118,220	1	118,220	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
University of Delaware	2	602,250	2	602,250	—	—	—	—
Total Delaware	**3**	**720,470**	**3**	**720,470**	**—**	**—**	**—**	**—**
District of Columbia								
American Institutes for Research	1	21,653	—	—	—	—	1	21,653
American Registry of Pathology, Inc.	1	279,087	1	279,087	—	—	—	—
Children's Research Institute	5	2,111,658	4	2,063,510	1	48,148	—	—
International Society for Cellular Therapy	—	6,600	—	6,600	—	—	—	—
Georgetown University	14	5,870,768	14	5,870,768	—	—	—	—
George Washington University	13	4,145,042	9	2,749,706	—	—	4	1,395,336
Howard University	4	2,212,861	2	1,397,255	1	122,401	1	693,205
MedStar Research Institute	1	907,989	—	—	—	—	1	907,989
Millennium Health Multimedia	1	297,751	1	297,751	—	—	—	—
State of the Art, Inc.	1	333,894	1	333,894	—	—	—	—
U.S. Department of Agriculture	1	1200,000	1	200,000	—	—	—	—
U.S. Department of Veterans Affairs Medical Center	1	162,410	—	—	—	—	1	162,410
Total District of Columbia	**43**	**16,549,713**	**33**	**13,198,571**	**2**	**170,549**	**8**	**3,180,593**
Florida								
Applied Genetic Technologies Corporation	1	131,711	1	131,711	—	—	—	—
Florida Agricultural and Mechanical University	—	329,775	—	329,775	—	—	—	—
Florida Atlantic University	3	662,350	3	662,350	—	—	—	—
Florida Institute of Technology	1	243,250	1	243,250	—	—	—	—
Florida International University	—	189,897	—	189,897	—	—	—	—
Florida State University	3	1,245,354	3	1,245,354	—	—	—	—
Innovia, LLC	1	99,345	1	99,345	—	—	—	—
Mount Sinai Medical Center, Miami Beach	—	3,000,000	—	3,000,000	—	—	—	—
Nanoptics, Inc.	1	587,422	1	587,422	—	—	—	—
Nemours Children's Clinics	2	836,770	2	836,770	—	—	—	—
Nova Southeastern University	1	111,993	1	111,993	—	—	—	—
University of Central Florida	3	753,567	3	753,567	—	—	—	—
University of Florida	41	13,462,325	37	12,267,013	3	204,814	1	990,498
University of Miami	20	8,678,112	17	7,234,901	2	681,464	1	761,747
University of South Florida	5	1,514,164	5	1,514,164	—	—	—	—
Vicor Technologies, Inc.	1	100,000	1	100,000	—	—	—	—
Total Florida	**83**	**31,946,035**	**76**	**29,307,512**	**5**	**886,278**	**2**	**1,752,245**
Georgia								
American Cardiovascular Research Institute	2	379,271	2	379,271	—	—	—	—
AuraZyme Pharmaceuticals, Inc.	1	100,000	1	100,000	—	—	—	—
CryoFacets, Inc.	1	99,997	1	99,997	—	—	—	—
Emory University	70	23,214,376	63	21,745,788	6	515,395	1	953,193

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Georgia Institute of Technology	7	3,220,792	6	3,174,372	1	46,420	—	—
Georgia State University	3	785,576	3	785,576	—	—	—	—
Medical College of Georgia	31	12,675,731	29	12,316,721	2	359,010	—	—
Mercer University, Macon	1	164,028	1	164,028	—	—	—	—
Morehouse School of Medicine	11	4,290,334	10	4,004,754	1	285,580	—	—
NitrOSystems, Inc.	1	139,306	1	139,306	—	—	—	—
Transfusion and Transplantation Technology (3Ti)	2	502,682	2	502,682	—	—	—	—
University of Georgia	3	525,775	2	487,400	1	38,375	—	—
U.S. Centers for Disease Control and Prevention	1	725,000	—	—	—	—	1	725,000
Total Georgia	**134**	**46,822,868**	**121**	**43,899,895**	**11**	**1,244,780**	**2**	**1,678,193**
Hawaii								
Staub Pacific Health Foundation-Health Research Institute	2	1,253,951	2	1,253,951	—	—	—	—
University of Hawaii at Hilo	—	308,164	—	308,164	—	—	—	—
University of Hawaii at Manoa	2	1,312,449	1	284,450	—	—	1	1,027,999
Total Hawaii	**4**	**2,874,564**	**3**	**1,846,565**	**—**	**—**	**1**	**1,027,999**
Illinois								
AJ Medical Engineering	1	150,000	1	150,000	—	—	—	—
American Academy of Pediatrics	1	261,714	1	261,714	—	—	—	—
BioTechPlex Corporation	2	754,695	2	754,695	—	—	—	—
Children's Memorial Hospital, Chicago	1	98,010	1	98,010	—	—	—	—
Evanston Northwestern Healthcare Research Institute	2	666,260	2	666,260	—	—	—	—
Finch University Health Sciences, Chicago Medical School	2	507,000	2	507,000	—	—	—	—
Hektoen Institute for Medical Research	1	593,564	1	593,564	—	—	—	—
Howard Brown Health Center	—	94,531	—	94,531	—	—	—	—
Illinois Institute of Technology	1	286,570	1	286,570	—	—	—	—
Loyola University Medical Center	23	7,722,826	21	7,634,978	2	87,848	—	—
Midwestern University	1	127,360	1	127,360	—	—	—	—
Nanosphere, Inc.	1	344,348	1	344,348	—	—	—	—
Northwestern University	65	21,920,932	58	19,580,347	4	515,101	3	1,825,484
Rush-Presbyterian-St. Luke's Medical Center	12	5,361,952	11	4,608,558	—	—	1	753,394
SloWave, Inc.	1	287,771	1	287,771	—	—	—	—
Southern Illinois University, Carbondale	2	586,550	2	586,550	—	—	—	—
Southern Illinois University School of Medicine	1	246,750	1	246,750	—	—	—	—
SSC Small Business Illinois	1	99,907	—	—	—	—	1	99,907
University of Chicago	38	13,131,557	31	11,584,582	5	1,403,726	2	143,249
University of Illinois at Chicago	41	16,360,907	37	15,044,176	4	1,316,731	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
University of Illinois at Urbana-Champaign	5	1,724,802	5	1,724,802	—	—	—	—
Total Illinois	**202**	**71,328,006**	**180**	**65,182,566**	**15**	**3,323,406**	**7**	**2,822,034**
Indiana								
Bioanalytical Systems, Inc.	1	118,934	1	118,934	—	—	—	—
Clarian Health Partners	1	257,360	1	257,360	—	—	—	—
General Biotechnology, LLC	1	501,561	1	501,561	—	—	—	—
Indiana University Bloomington	1	34,157	1	34,157	—	—	—	—
Indiana University-Purdue University Indianapolis	49	16,261,342	44	15,640,567	4	618,590	1	2,185
Purdue University, West Lafayette	2	638,024	2	638,024	—	—	—	—
Space Hardware Optimization Technology, Inc.	1	92,549	1	92,549	—	—	—	—
University of Notre Dame	4	1,677,052	4	1,677,052	—	—	—	—
Total Indiana	**60**	**19,580,979**	**55**	**18,960,204**	**4**	**618,590**	**1**	**2,185**
Iowa								
Drake University	2	257,283	2	257,283	—	—	—	—
Maharishi University of Management	2	904,337	2	904,337	—	—	—	—
University of Iowa	76	31,992,471	69	31,446,931	6	2,329,722	1	1,215,818
Total Iowa	**80**	**36,154,091**	**73**	**32,608,551**	**6**	**2,329,722**	**1**	**1,215,818**
Kansas								
Kansas State University	5	535,397	2	436,500	3	98,897	—	—
University of Kansas, Lawrence	2	713,293	2	713,293	—	—	—	—
University of Kansas Medical Center	9	2,304,897	9	2,304,897	—	—	—	—
Wichita State University	1	178,820	1	178,820	—	—	—	—
Total Kansas	**17**	**3,732,407**	**14**	**3,633,510**	**3**	**98,897**	**—**	**—**
Kentucky								
Cardiojustable, LLC	1	100,000	1	100,000	—	—	—	—
University of Kentucky	37	9,655,853	36	9,600,190	—	—	1	55,663
University of Louisville	34	9,532,827	30	9,342,523	4	190,304	—	—
Vitatech, LLC	1	107,000	1	107,000	—	—	—	—
Total Kentucky	**73**	**19,395,680**	**68**	**19,149,713**	**4**	**190,304**	**1**	**55,663**
Louisiana								
Louisiana State University Health Sciences, New Orleans	9	2,078,460	6	1,654,608	—	—	3	423,852
Louisiana State University Health Sciences, Shreveport	4	863,162	4	863,162	—	—	—	—
Louisiana State University Pennington Biomedical Research Center	3	3,763,658	3	3,763,658	—	—	—	—
Tulane University of Louisiana	20	7,800,388	18	7,609,625	2	190,763	—	—
Xavier University of Louisiana	—	108,344	—	108,344	—	—	—	—
Total Louisiana	**36**	**14,614,012**	**31**	**13,999,397**	**2**	**190,763**	**3**	**423,852**

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Maine								
Jackson Laboratory	11	7,734,359	9	7,593,656	2	140,703	—	—
Maine Medical Center	6	2,083,450	6	2,083,450	—	—	—	—
University of Maine	1	459,194	1	459,194	—	—	—	—
University of New England	1	358,787	1	358,787	—	—	—	—
Total Maine	**19**	**10,635,790**	**17**	**10,495,087**	**2**	**140,703**	**—**	**—**
Maryland								
American National Red Cross	20	7,175,175	19	6,818,276	1	356,899	—	—
Amulet Pharmaceuticals, Inc.	1	207,500	1	207,500	—	—	—	—
Biotech Research Laboratories (BTRL)	1	981,255	—	—	—	—	1	981,255
Claragen, Inc.	1	100,000	1	100,000	—	—	—	—
Clearant, Inc.	2	682,589	2	682,589	—	—	—	—
Clinical Trials and Surveys Corp.	7	810,815	—	—	—	—	7	810,815
Computers in Cardiology, Inc.	1	10,000	1	10,000	—	—	—	—
EMMES Corporation	2	626,240	—	—	—	—	2	626,240
Federation of American Societies for Experimental Biology	2	35,000	2	35,000	—	—	—	—
Fogarty International Center	1	300,000	—	—	—	—	1	300,000
Gallup Indian Medical Center	1	6,688,984	—	—	—	—	1	6,688,984
Henry M. Jackson Foundation for the Advancement of Military Medicine	8	4,517,740	5	1,796,080	1	174,272	2	2,547,388
Individual Monitoring Systems, Inc.	1	481,611	1	481,611	—	—	—	—
Institute for Genomic Research	3	2,589,079	3	2,589,079	—	—	—	—
Intronn LLC	1	596,898	1	596,898	—	—	—	—
Johns Hopkins Hospital	2	3,379,994	—	—	—	—	2	3,379,994
Johns Hopkins University	180	79,684,248	160	72,434,901	12	3,682,376	8	3,566,971
Lexmed Technologies, Inc.	1	99,128	1	99,128	—	—	—	—
Maryland Medical Research Institute	3	1,988,595	2	994,672	—	—	1	993,923
MaxCyte, Inc.	1	95,725	1	95,725	—	—	—	—
MedStar Research Institute	4	5,311,708	4	5,311,708	—	—	—	—
National Cancer Institute	2	600,000	—	—	—	—	2	600,000
National Center for Complementary and Alternative Medicine	1	200,000	—	—	—	—	1	200,000
National Center for Health Statistics	1	245,760	—	—	—	—	1	245,760
National Heart, Lung, and Blood Institute	2	2,552,757	—	—	—	—	2	2,552,757
National Institute of Diabetes and Digestive and Kidney Diseases	1	4,000,000	—	—	—	—	1	4,000,000
National Institute of Child Health and Human Development	1	3,000,000	—	—	—	—	1	3,000,000
Peace Technology, Inc.	2	2,468,034	—	—	—	—	2	2,468,034
Perinatronics Medical Systems, Inc.	1	535,918	1	535,918	—	—	—	—
Prospect Associates, Ltd.	2	7,525,000	—	—	—	—	2	7,525,000
Robin Medical, Inc.	1	586,250	1	586,250	—	—	—	—
ROW Sciences, Inc.	1	652,388	—	—	—	—	1	652,388
Society for Leukocyte Biology	—	5,000	—	5,000	—	—	—	—
Take Aim Media, Inc.	1	247,626	1	247,626	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
U.S. Bureau of the Census	2	654,000	—	—	—	—	2	654,000
University of Maryland, Baltimore County Campus	1	309,510	1	309,510	—	—	—	—
University of Maryland Baltimore Professional School	34	13,359,282	32	12,881,932	2	477,350	—	—
University of Maryland, College Park Campus	2	1,021,257	2	1,021,257	—	—	—	—
University of Maryland Biotechnology Institute	3	974,803	3	974,803	—	—	—	—
U.S. Agricultural Research Center	2	800,000	—	—	—	—	2	800,000
U.S. PHS Public Advisory Groups	—	3,282,000	—	3,282,000	—	—	—	—
Westat, Inc.	2	1,554,682	1	576,709	—	—	1	977,973
Total Maryland	**315**	**222,528,726**	**246**	**112,674,172**	**16**	**4,690,897**	**53**	**105,163,657**
Massachusetts								
ABIOMED, Inc.	2	199,525	2	199,525	—	—	—	—
Baystate Medical Center	1	281,638	—	—	—	—	1	281,638
Beth Israel Deaconess Medical Center	56	23,386,844	52	22,485,172	4	901,672	—	—
Biomod Surfaces	2	621,949	2	621,949	—	—	—	—
BioPhysics Assay Laboratory, Inc. (BioPAL)	1	98,567	1	98,567	—	—	—	—
BioSurfaces	1	200,000	1	200,000	—	—	—	—
BIOTEK, Inc.	1	99,975	1	99,975	—	—	—	—
Boston Biomedical Research Institute	11	4,185,513	10	4,135,649	1	49,864	—	—
Boston Medical Center	17	8,946,768	17	8,946,768	—	—	—	—
Boston University	4	16,184,330	—	—	—	—	4	16,184,330
Boston University, Charles River Campus	7	1,727,387	6	1,694,350	1	33,037	—	—
Boston University Medical Campus	73	32,751,608	64	29,696,710	9	3,054,898	—	—
Brigham and Women's Hospital	136	65,265,580	116	58,776,976	17	3,565,409	3	2,923,195
Cardiovascular Engineering, Inc.	1	100,000	1	100,000	—	—	—	—
Center for Blood Research	10	10,882,447	10	10,882,447	—	—	—	—
Children's Hospital Boston	58	20,382,902	52	18,762,004	6	1,620,898	—	—
Covalent Associates, Inc.	1	361,589	1	361,589	—	—	—	—
Dana-Farber Cancer Institute	18	8,496,878	18	8,496,878	—	—	—	—
Engineering Partnership, Ltd.	1	459,838	1	459,838	—	—	—	—
Eukarion, Inc.	1	155,941	1	155,941	—	—	—	—
Foster-Miller, Inc.	1	206,459	1	206,459	—	—	—	—
Gene Regulation Laboratories	1	450,000	1	450,000	—	—	—	—
Giner Electrochemical Systems, LLC	1	369,780	1	369,780	—	—	—	—
Giner, Inc.	1	376,219	1	376,219	—	—	—	—
Green Lights, Inc.	1	99,619	1	99,619	—	—	—	—
Haitian Community AIDS Outreach Project	1	365,452	1	365,452	—	—	—	—
Harvard Pilgrim Health Care, Inc.	2	1,203,011	2	1,203,011	—	—	—	—
Harvard University	14	8,733,020	14	8,733,020	—	—	—	—
Harvard University Medical School	6	992,814	—	—	6	992,814	—	—
Harvard University School of Public Health	27	14,118,853	25	13,505,063	2	613,790	—	—
Inotek Corporation	5	2,531,009	5	2,531,009	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Institute for the Study and Treatment for Cardiovascular Diseases	1	1,230,000	1	1,230,000	—	—	—	—
IQuum, Inc.	3	1,614,291	3	1,614,291	—	—	—	—
Joslin Diabetes Center	1	552,558	1	552,558	—	—	—	—
Levitronix, LLC	2	422,439	2	422,439	—	—	—	—
Marine Biological Laboratory	1	310,000	1	310,000	—	—	—	—
Massachusetts Eye and Ear Infirmary	1	125,771	1	125,771	—	—	—	—
Massachusetts General Hospital	77	27,305,591	67	23,341,852	8	1,237,025	2	2,726,714
Massachusetts Institute of Technology	11	7,517,194	11	7,517,194	—	—	—	—
Massachusetts Mental Health Institute	1	200,550	1	200,550	—	—	—	—
Melville Biologics, Inc.	2	463,432	2	463,432	—	—	—	—
New England Medical Center	30	9,108,496	25	8,676,460	2	248,999	3	183,037
New England Research Institutes, Inc.	5	4,673,884	5	4,673,884	—	—	—	—
Northeastern University	1	237,750	1	237,750	—	—	—	—
Physical Sciences, Inc.	2	802,351	2	802,351	—	—	—	—
St. Elizabeth's Medical Center of Boston	5	3,130,433	5	3,130,433	—	—	—	—
Tufts University, Boston	16	4,610,036	14	4,407,730	2	202,306	—	—
University of Massachusetts Medical School	21	7,684,380	19	6,799,451	1	126,509	1	758,330
University of Massachusetts, Amherst	1	25,773	—	—	1	25,773	—	—
Verax Biomedical, Inc.	2	642,950	2	642,950	—	—	—	—
ViaCell, Inc.	1	100,000	1	100,000	—	—	—	—
Whitehead Institute for Biomedical Research	1	251,500	1	251,500	—	—	—	—
Total Massachusetts	**647**	**295,244,804**	**573**	**259,514,566**	**60**	**12,672,994**	**14**	**23,057,244**
Michigan								
Aastrom Biosciences, Inc.	1	99,840	1	99,840	—	—	—	—
Case Western Reserve University, Henry Ford Health Sciences	13	6,233,766	13	6,233,766	—	—	—	—
Eastern Michigan University	1	160,709	1	160,709	—	—	—	—
Human Proteome Organization	—	10,000	—	10,000	—	—	—	—
MedArray, Inc.	1	387,380	1	387,380	—	—	—	—
Michigan Critical Care Consultants, Inc.	3	917,673	3	917,673	—	—	—	—
Michigan State University	9	3,149,868	8	3,113,472	1	36,396	—	—
Molecular Innovations, Inc.	1	437,057	1	437,057	—	—	—	—
MRI Institute for Biomedical Research	1	344,499	1	344,499	—	—	—	—
Neural Intervention Technologies, Inc.	1	137,520	1	137,520	—	—	—	—
Oakland University	1	71,000	1	71,000	—	—	—	—
Pixel Velocity, Inc.	1	99,650	1	99,650	—	—	—	—
Sentec Corporation	1	164,235	1	164,235	—	—	—	—
St. Joseph Mercy Community Health Care System	1	177,470	1	177,470	—	—	—	—
TSRL, Inc.	1	205,333	1	205,333	—	—	—	—
University of Michigan at Ann Arbor	103	42,143,793	96	39,945,384	6	2,056,858	1	141,551
Wayne State University	16	4,624,826	15	3,939,337	—	—	1	685,489
Western Michigan University	1	181,875	1	181,875	—	—	—	—
Total Michigan	**156**	**59,546,494**	**147**	**56,626,200**	**7**	**2,093,254**	**2**	**827,040**

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Minnesota								
Advanced Medical Electronics Corporation	6	2,073,696	6	2,073,696	—	—	—	—
BSI Corporation	1	366,024	1	366,024	—	—	—	—
CPRX LLC	—	50,000	—	50,000	—	—	—	—
Discovery Genomics, Inc.	1	145,095	1	145,095	—	—	—	—
Gel-Del Technologies, Inc.	1	149,800	1	149,800	—	—	—	—
Mayo Clinic, Rochester	58	20,422,107	52	19,458,961	6	963,146	—	—
Mayo Foundation	1	50,189	—	—	—	—	1	50,189
Minneapolis Medical Research Foundation, Inc.	3	3,092,119	1	127,845	—	—	2	2,964,274
Minnesota Veterans Reserach Institute	1	790,100	1	790,100	—	—	—	—
Paradigm Pharmaceuticals, LLC	2	200,000	2	200,000	—	—	—	—
Restore Medical, Inc.	1	98,114	1	98,114	—	—	—	—
University of Minnesota, Twin Cities	91	37,257,917	74	31,853,570	8	1,529,441	9	3,874,906
Wilson Wolf Manufacturing Corp.	1	591,876	1	591,876	—	—	—	—
Total Minnesota	**167**	**65,287,037**	**141**	**55,905,081**	**14**	**2,492,587**	**12**	**6,889,369**
Mississippi								
Tougaloo College	1	397,668	—	—	—	—	1	397,668
University of Mississippi	1	56,091	—	—	1	56,091	—	—
University of Mississippi Medical Center	16	7,969,090	11	5,649,455	3	102,752	2	2,216,883
Total Mississippi	**18**	**8,422,849**	**11**	**5,649,455**	**4**	**158,843**	**3**	**2,614,551**
Missouri								
Barnes-Jewish Hospital	—	155,681	—	155,681	—	—	—	—
Cardiovascular Imaging Technologies, LLC	1	97,423	1	97,423	—	—	—	—
Children's Mercy Hospital, Kansas City	2	423,790	2	423,790	—	—	—	—
Engineering Software Research and Development, Inc.	1	252,696	1	252,696	—	—	—	—
Lifeline Technologies, Inc.	1	235,129	1	235,129	—	—	—	—
St. Louis University	19	5,148,120	19	5,148,120	—	—	—	—
University of Missouri, Columbia	19	5,657,939	14	5,347,368	5	310,571	—	—
University of Missouri, St. Louis	1	232,955	1	232,955	—	—	—	—
Washington University	125	48,623,983	111	45,245,680	13	2,915,903	1	462,400
Total Missouri	**169**	**60,827,716**	**150**	**57,138,842**	**18**	**3,226,474**	**1**	**462,400**
Montana								
Montana State University-Bozeman	2	641,200	2	641,200	—	—	—	—
Total Montana	**2**	**641,200**	**2**	**641,200**	**—**	**—**	**—**	**—**
Nebraska								
Creighton University	1	39,645	—	—	1	39,645	—	—
University of Nebraska, Lincoln	1	288,000	1	288,000	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
University of Nebraska Medical Center	10	4,676,768	10	4,676,768	—	—	—	—
Total Nebraska	**12**	**5,004,413**	**11**	**4,964,768**	**1**	**39,645**	**—**	**—**
Nevada								
Sierra Biomedical Research Corporation	2	807,393	2	807,393	—	—	—	—
University of Nevada at Reno	9	3,262,422	8	2,517,735	—	—	1	744,687
Total Nevada	**11**	**4,069,815**	**10**	**3,325,128**	**—**	**—**	**1**	**744,687**
New Hampshire								
Creare, Inc.	1	137,018	1	137,018	—	—	—	—
Dartmouth College	17	4,655,450	16	4,605,946	1	49,504	—	—
Psychological Applications, LLC	1	412,752	1	412,752	—	—	—	—
University of New Hampshire	2	288,253	2	288,253	—	—	—	—
Total New Hampshire	**21**	**5,493,473**	**20**	**5,443,969**	**1**	**49,504**	**—**	**—**
New Jersey								
Coecare.Com, LLC	1	99,944	1	99,944	—	—	—	—
Collagen Matrix, Inc.	1	162,005	1	162,005	—	—	—	—
DVX, LLC	2	199,656	2	199,656	—	—	—	—
Genome Data Systems, Inc.	1	140,238	1	140,238	—	—	—	—
LifeCell Corporation	1	98,050	1	98,050	—	—	—	—
Life Recovery Systems, Inc.	1	100,000	1	100,000	—	—	—	—
Public Health Research Institute of the City of New York	3	1,421,883	3	1,421,883	—	—	—	—
PharmaSeq, Inc.	1	100,000	1	100,000	—	—	—	—
PortaScience, Inc.	1	338,441	1	338,441	—	—	—	—
Princeton University	2	619,382	2	619,382	—	—	—	—
Rutgers, The State University of New Jersey, New Brunswick	3	481,463	2	256,608	1	224,855	—	—
University of Medicine and Dentistry of New Jersey	16	9,242,232	13	7,694,597	1	98,531	2	1,449,104
University of Medicine and Dentistry of New Jersey, R.W. Johnson Medical School	9	4,084,198	9	4,084,198	—	—	—	—
University of Medicine and Dentistry of New Jersey, School of Osteopathic Medicine	1	155,500	1	155,500	—	—	—	—
VueSonix Sensors, Inc.	1	347,750	1	347,750	—	—	—	—
Xechem, Inc.	1	99,372	1	99,372	—	—	—	—
Total New Jersey	**45**	**17,690,114**	**41**	**15,917,624**	**2**	**323,386**	**2**	**1,449,104**
New Mexico								
Diné College	—	411,710	—	411,710	—	—	—	—
Lovelace Biomedical and Environmental Research	7	2,398,359	7	2,398,359	—	—	—	—
New Mexico Resonance	1	479,387	1	479,387	—	—	—	—
Southwest Sciences, Inc.	1	418,878	1	418,878	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
U.S. Department of Veterans Affairs Medical Center, Albuquerque	3	3,590,680	—	—	—	—	3	3,590,680
University of New Mexico, Albuquerque	10	3,714,151	8	3,397,924	1	1	1	316,226
Total New Mexico	**22**	**11,013,165**	**17**	**7,106,258**	**1**	**1**	**4**	**3,906,906**
New York								
Accountants for the Public Interest	1	271,044	1	271,044	—	—	—	—
Albany Medical College of Union University	8	2,274,337	7	1,703,771	1	570,566	—	—
American Thoracic Society	1	30,000	1	30,000	—	—	—	—
Angion Biomedica Corporation	2	997,069	2	997,069	—	—	—	—
Circulatory Technology, Inc.	1	380,525	1	380,525	—	—	—	—
City College of New York	5	1,459,563	5	1,455,783	—	3,780	—	—
Columbia University, New York Morningside	4	1,469,648	4	1,469,648	—	—	—	—
Columbia University, New York	1	117,976	—	—	—	—	1	117,976
Columbia University Health Sciences	69	32,511,954	65	31,425,271	4	1,086,683	—	—
Cornell University, Ithaca	6	2,241,513	6	2,241,513	—	—	—	—
Cornell University Medical Center	3	3,063,582	—	—	—	—	3	3,063,582
CUNY Graduate School and University Center	1	312,500	1	312,500	—	—	—	—
Dawkins Productions, Inc.	1	97,907	1	97,907	—	—	—	—
Foster-Miller Technologies, Inc.	4	2,149,093	4	2,149,093	—	—	—	—
Hofstra University	2	199,255	1	152,835	1	46,420	—	—
Hospital for Special Surgery	1	135,540	1	135,540	—	—	—	—
Queens College, CUNY	2	469,450	2	469,450	—	—	—	—
Masonic Medical Research Laboratory, Inc.	3	1,033,401	3	1,033,401	—	—	—	—
Mohawk Innovative Technology, Inc.	1	99,454	1	99,454	—	—	—	—
Montefiore Medical Center, Bronx	2	413,742	2	413,742	—	—	—	—
Mount Sinai School of Medicine	30	15,463,826	27	11,877,784	2	557,052	1	3,028,990
National Neurofibromatosis Foundation	—	10,000	—	10,000	—	—	—	—
New York Blood Center	4	2,296,721	4	2,296,721	—	—	—	—
New York Medical College	24	10,585,249	24	10,585,249	—	—	—	—
New York University	1	221,250	1	221,250	—	—	—	—
New York University School of Medicine	25	8,315,310	23	8,091,212	2	224,098	—	—
North Shore-Long Island Jewish Research Institute	2	731,990	2	731,990	—	—	—	—
Rensselaer Polytechnic Institute	1	257,185	1	257,185	—	—	—	—
Rockefeller University	7	4,063,150	7	4,063,150	—	—	—	—
Roswell Park Cancer Institute Corporation	3	1,056,724	3	1,056,724	—	—	—	—
Sloan-Kettering Institute for Cancer Research	9	2,206,812	7	2,140,735	—	—	2	66,077
State University of New York at Albany	1	257,510	1	257,510	—	—	—	—
State University of New York Binghamton	1	150,500	1	150,500	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
State University of New York at Buffalo	17	5,450,809	15	4,474,649	1	115,625	1	860,535
State University of New York Stony Brook	19	6,060,653	18	5,320,147	—	—	1	740,506
St. John's University	1	626,546	1	626,546	—	—	—	—
St. Lawrence University	1	114,290	1	114,290	—	—	—	—
St. Luke's-Roosevelt Hospital Center	7	2,383,430	7	2,383,430	—	—	—	—
STS duoTEK, Inc.	1	399,609	1	399,609	—	—	—	—
SUNY Health Science Center at Brooklyn	6	1,875,751	6	1,875,751	—	—	—	—
SUNY Health Science Center at Syracuse	7	4,035,182	7	4,035,182	—	—	—	—
Syracuse University	1	226,500	1	226,500	—	—	—	—
Transonic Systems, Inc.	2	777,513	2	777,513	—	—	—	—
Trudeau Institute, Inc.	5	3,240,752	5	3,240,752	—	—	—	—
Trustees of Columbia University of New York City	4	1,389,982	—	—	—	—	4	1,389,982
University of Rochester	47	17,769,952	40	16,301,611	7	1,468,341	—	—
Vascular Therapies, LLC	1	125,000	1	125,000	—	—	—	—
Weill Medical College of Cornell University	42	23,853,561	40	23,614,774	2	238,787	—	—
Winthrop-University Hospital	2	717,981	2	717,981	—	—	—	—
Yeshiva University	25	15,790,257	22	14,231,803	2	242,458	1	1,315,996
Total New York	**414**	**180,181,548**	**378**	**165,044,094**	**22**	**4,553,810**	**14**	**10,583,644**
North Carolina								
Biomarck Pharmaceuticals	1	100,000	1	100,000	—	—	—	—
BreathQuant Medical Systems, Inc.	1	106,486	1	106,486	—	—	—	—
Campbell University	1	175,000	1	175,000	—	—	—	—
Carolinas Medical Center	2	608,183	2	608,183	—	—	—	—
Clinical Tools, Inc.	1	402,129	1	402,129	—	—	—	—
Duke University	132	59,551,735	117	57,603,207	12	1,442,143	3	506,385
East Carolina University	1	124,665	1	124,665	—	—	—	—
H-Cubed, Inc.	1	104,998	1	104,998	—	—	—	—
Healthcare Corporation	—	73,057	—	73,057	—	—	—	—
Nekton Research, LLC	1	109,888	1	109,888	—	—	—	—
Nobex Corporation	1	100,000	1	100,000	—	—	—	—
North Carolina State University at Raleigh	5	1,188,546	4	1,066,336	1	122,210	—	—
North Carolina Central University	1	500,000	1	500,000	—	—	—	—
Oriel Therapeutics, Inc.	1	97,211	1	97,211	—	—	—	—
Rho Federal Systems Division, Inc.	1	1,049,982	1	1,049,982	—	—	—	—
University of North Carolina at Chapel Hill	80	36,179,124	74	31,761,146	6	1,608,881	4	2,809,097
Wake Forest University Health Sciences	53	30,597,514	40	19,980,437	3	583,160	10	10,033,917
Williams LifeSkills, Inc.	2	474,986	2	474,986	—	—	—	—
Winston-Salem State University	1	114,509	1	114,509	—	—	—	—
Total North Carolina	**290**	**131,658,013**	**251**	**114,552,220**	**22**	**3,756,394**	**17**	**13,349,399**

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
North Dakota								
North Dakota State University	2	279,540	2	279,540	—	—	—	—
Total North Dakota	**2**	**279,540**	**2**	**279,540**	**—**	**—**	**—**	**—**
Ohio								
BIOMEC, Inc.	4	1,900,533	4	1,900,533	—	—	—	—
Bowling Green State University	1	136,200	1	136,200	—	—	—	—
CardioEnergetics, Inc.	1	290,489	1	290,489	—	—	—	—
Case Western Reserve University	71	29,308,913	62	24,344,494	7	969,614	2	3,994,805
Celsus Laboratories, Inc.	1	223,787	1	223,787	—	—	—	—
ChanTest, Inc.	1	379,815	1	379,815	—	—	—	—
Children's Hospital Medical Center of Cincinnati	49	21,019,941	45	20,685,699	4	334,242	—	—
Children's Research Institute	2	631,693	2	631,693	—	—	—	—
Cleveland Clinic Foundation	41	13,214,051	36	12,910,032	5	304,019	—	—
Cleveland Clinic Lerner College of Medicine of Case Western Reserve University	18	7,713,419	18	7,713,419	—	—	—	—
Cleveland Medical Devices, Inc.	1	616,795	1	616,795	—	—	—	—
Deca-Medics, Inc.	1	151,452	1	151,452	—	—	—	—
Enable Medical Corporation	1	366,848	1	366,848	—	—	—	—
IVR, Inc.	2	437,654	2	437,654	—	—	—	—
Medical College of Ohio at Toledo	9	3,567,235	9	3,567,235	—	—	—	—
Ohio State University	29	9,297,714	26	8,316,365	2	261,236	1	720,113
Ohio University, Athens	1	328,814	1	328,814	—	—	—	—
Spectra Research, Inc.	1	432,778	1	432,778	—	—	—	—
The Lam Foundation	1	12,000	1	12,000	—	—	—	—
University of Cincinnati	49	19,592,570	45	17,963,758	3	943,951	1	684,861
Wright State University	5	1,788,139	4	1,702,815	1	85,324	—	—
Total Ohio	**289**	**111,410,840**	**263**	**103,112,675**	**22**	**2,898,386**	**4**	**5,399,779**
Oklahoma								
Langston University	1	466,083	1	466,083	—	—	—	—
Oklahoma Medical Research Foundation	8	4,347,234	8	4,347,234	—	—	—	—
Oklahoma State University College of Osteopathic Medicine	1	144,100	1	144,100	—	—	—	—
Oklahoma State University, Stillwater	2	586,354	2	586,354	—	—	—	—
University of Oklahoma Health Sciences Center	14	4,775,293	12	4,731,429	2	43,864	—	—
Total Oklahoma	**26**	**10,319,064**	**24**	**10,275,200**	**2**	**43,864**	**—**	**—**
Oregon								
Dimera, LLC	2	526,257	2	526,257	—	—	—	—
Inovise Medical, Inc.	1	513,892	1	513,892	—	—	—	—
Oregon Research Institute	1	359,638	1	359,638	—	—	—	—
Oregon State University	1	250,250	1	250,250	—	—	—	—
Oregon Health & Science University	36	12,555,192	30	11,903,910	6	651,282	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Portland State University	1	336,590	1	336,590	—	—	—	—
University of Oregon	3	799,380	3	799,380	—	—	—	—
Total Oregon	**45**	**15,341,199**	**39**	**14,689,917**	**6**	**651,282**	**—**	**—**
Pennsylvania								
Allegheny-Singer Research Institute	1	396,905	1	396,905	—	—	—	—
APD Life Sciences, Inc.	1	524,184	1	524,184	—	—	—	—
Carnegie-Mellon University	5	1,615,453	4	1,561,509	1	53,944	—	—
Children's Hospital of Philadelphia	38	23,332,875	35	22,851,129	3	481,746	—	—
Children's Hospital of Pittsburgh	5	1,165,062	4	1,113,158	1	51,904	—	—
Drexel University	4	1,079,148	4	1,079,148	—	—	—	—
Ension, Inc.	2	892,027	2	892,027	—	—	—	—
Fluent Cardiovascular Solutions, Inc.	1	100,000	1	100,000	—	—	—	—
Fox Chase Cancer Center	2	720,333	2	720,333	—	—	—	—
Guthrie Foundation for Education and Research	2	558,684	2	558,684	—	—	—	—
Industrial Science and Technology Network, Inc.	1	383,517	1	383,517	—	—	—	—
InSight TeleHealth Systems, LLC	1	348,638	1	348,638	—	—	—	—
Institute for Cancer Research	1	449,721	1	449,721	—	—	—	—
Integral Molecular	1	139,885	1	139,885	—	—	—	—
Magainin Pharmaceuticals, Inc.	1	152,967	1	152,967	—	—	—	—
Magee-Women's Health Corporation	2	567,447	2	567,447	—	—	—	—
MCP Hahnemann University	2	629,000	2	629,000	—	—	—	—
Medical Diagnostic Research Foundation	1	300,350	1	300,350	—	—	—	—
Pennsylvania State University, Milton S. Hershey Medical Center	22	6,986,200	20	6,893,079	2	93,121	—	—
Pennsylvania State University, University Park	3	890,038	3	890,038	—	—	—	—
Spectrasonics Imaging, Inc.	1	87,640	1	87,640	—	—	—	—
Temple University	14	6,279,212	12	5,683,383	2	595,829	—	—
Thomas Jefferson University	20	6,798,611	17	6,634,621	3	163,990	—	—
University of Pennsylvania	134	54,790,633	114	50,584,003	19	4,152,299	1	54,331
University of Pittsburgh at Pittsburgh	96	47,694,606	83	43,960,685	8	1,337,802	5	2,396,119
Vascor, Inc.	1	329,588	1	329,588	—	—	—	—
Weis Center for Research, Geisinger Clinic	1	266,600	1	266,600	—	—	—	—
Wistar Institute	4	1,157,076	4	1,157,076	—	—	—	—
Total Pennsylvania	**367**	**158,636,400**	**322**	**149,255,315**	**39**	**6,930,635**	**6**	**2,450,450**
Rhode Island								
BCR Diagnostics	1	329,872	1	329,872	—	—	—	—
Brown University	7	2,758,075	6	2,701,704	1	56,371	—	—
Gordon Research Conferences	2	36,600	2	36,600	—	—	—	—
Memorial Hospital of Rhode Island	2	1,826,984	1	670,746	—	—	1	1,156,238
Miriam Hospital	6	2,074,493	5	2,034,793	1	39,700	—	—
Pro-Change Behavior Systems, Inc.	2	620,018	2	620,018	—	—	—	—
Rhode Island Hospital, Providence	6	2,512,581	6	2,472,881	1	39,700	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Roger Williams Hospital	2	571,859	2	571,859	—	—	—	—
Total Rhode Island	**29**	**10,730,482**	**25**	**9,438,473**	**3**	**135,771**	**1**	**1,156,238**
South Carolina								
Clemson University	3	720,000	3	720,000	—	—	—	—
Medical University of South Carolina	43	21,005,474	32	13,467,509	5	668,801	6	6,869,164
Organ Recovery Systems, Inc.	3	636,901	3	636,901	—	—	—	—
University of South Carolina at Columbia	11	3,705,647	10	3,687,221	1	18,426	—	—
Total South Carolina	**60**	**26,068,022**	**48**	**18,511,631**	**6**	**687,227**	**6**	**6,869,164**
South Dakota								
Missouri Breaks Research, Inc.	2	343,944	2	343,944	—	—	—	—
South Dakota Health Research Foundation	—	193,239	—	193,239	—	—	—	—
University of South Dakota	3	1,011,307	3	1,011,307	—	—	—	—
Total South Dakota	**5**	**1,548,490**	**5**	**1,548,490**	**—**	**—**	**—**	**—**
Tennessee								
East Tennessee State University	6	1,374,293	6	1,374,293	—	—	—	—
GeneRx+, Inc.	2	616,220	2	616,220	—	—	—	—
Meharry Medical College	10	2,508,475	7	1,910,677	3	597,798	—	—
St. Jude Children's Research Hospital	7	5,510,019	5	4,960,019	—	—	2	550,000
University of Memphis	3	1,750,848	3	1,750,848	—	—	—	—
University of Tennessee at Knoxville	2	328,614	1	278,750	1	49,864	—	—
University of Tennessee at Memphis	1	932,529	—	—	—	—	1	932,529
University of Tennessee Health Sciences Center	25	6,984,725	22	6,657,601	3	327,124	—	—
Vanderbilt University	78	32,657,179	66	30,581,359	12	2,075,820	—	—
Total Tennessee	**134**	**52,662,902**	**112**	**48,129,767**	**19**	**3,050,606**	**3**	**1,482,529**
Texas								
Ambion, Inc.	1	371,379	1	371,379	—	—	—	—
Baylor College of Medicine	84	34,357,215	71	30,480,231	9	1,672,970	4	2,204,014
Baylor Research Institute	2	435,335	2	435,335	—	—	—	—
Cardiac Screening Partners	1	99,723	1	99,723	—	—	—	—
Cooper Institute for Aerobics Research	3	1,491,393	3	1,491,393	—	—	—	—
Lynntech, Inc.	1	572,013	1	572,013	—	—	—	—
NanoMatrix, Inc.	1	124,521	1	124,521	—	—	—	—
Prairie View A&M University	—	146,487	—	146,487	—	—	—	—
Rice University	3	767,938	3	767,938	—	—	—	—
Southwest Foundation for Biomedical Research	9	12,522,499	8	10,122,499	—	—	1	2,400,000
Texas A&M University System	3	388,990	3	388,990	—	—	—	—
Texas A&M University Health Science Center	12	3,638,397	11	3,590,249	1	48,148	—	—
Texas Engineering Experiment Station	2	773,005	2	773,005	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Texas Southern University	1	540,802	1	540,802	—	—	—	—
Texas Technical University Health Sciences Center	3	973,387	3	973,387	—	—	—	—
University of North Texas Health Sciences Center	10	2,705,032	9	2,576,501	1	128,531	—	—
University of Texas at Austin	2	418,298	1	388,500	1	29,798	—	—
University of Texas at Dallas	3	979,302	3	979,302	—	—	—	—
University of Texas Health Sciences Center at Tyler	7	1,620,912	7	1,620,912	—	—	—	—
University of Texas Health Sciences Center Houston	37	14,231,710	34	11,013,397	1	41,886	2	3,176,427
University of Texas Health Sciences Center San Antonio	21	4,775,292	18	3,752,161	2	278,849	1	744,282
University of Texas M.D. Anderson Cancer Center	4	1,579,293	4	1,579,293	—	—	—	—
University of Texas Medical Branch Galveston	13	7,646,521	11	2,812,786	—	—	2	4,833,735
University of Texas-Pan American	—	360,755	—	360,755	—	—	—	—
University of Texas Southwestern Medical Center at Dallas	61	34,285,992	52	27,374,798	7	1,400,022	2	5,511,172
Total Texas	**284**	**125,806,191**	**250**	**103,336,357**	**22**	**3,600,204**	**12**	**18,869,630**
Utah								
Brigham Young University	1	219,000	1	219,000	—	—	—	—
LDS Hospital	1	119,978	1	119,978	—	—	—	—
Medical Physics, Inc.	1	96,425	1	96,425	—	—	—	—
Thrombodyne, Inc.	1	288,900	1	288,900	—	—	—	—
University of Utah	47	19,104,713	43	18,639,598	4	465,115	—	—
Total Utah	**51**	**19,829,016**	**47**	**19,363,901**	**4**	**465,115**	**—**	**—**
Vermont								
Haematologic Technologies, Inc.	2	149,217	2	149,217	—	—	—	—
University of Vermont and State Agricultural College	39	16,931,453	35	15,291,104	3	791,981	1	848,368
Total Vermont	**41**	**17,080,670**	**37**	**15,440,321**	**3**	**791,981**	**1**	**848,368**
Virginia								
Adenosine Therapeutics, LLC	1	100,885	1	100,885	—	—	—	—
Arete Associates	1	374,902	1	374,902	—	—	—	—
CEL-SCI Corporation	1	134,469	1	134,469	—	—	—	—
Cottler Technologies, LLC	1	435,775	1	435,775	—	—	—	—
CW Optics, Inc.	1	381,881	1	381,881	—	—	—	—
Eastern Virginia Medical School	2	465,605	2	465,605	—	—	—	—
Fiber And Sensor Technologies, Inc.	1	132,827	1	132,827	—	—	—	—
Hampton University	—	95,533	—	95,533	—	—	—	—
Personal Improvement Computer Systems	2	912,088	2	912,088	—	—	—	—
Talisman, Ltd	2	633,905	2	633,905	—	—	—	—
Targeted Dietetics, Inc.	1	99,620	1	99,620	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
University of Virginia, Charlottesville	60	20,061,224	51	18,450,120	6	1,331,978	3	279,126
Virginia Commonwealth University	19	5,887,888	18	5,852,848	1	35,040	—	—
Virginia Polytechnic Institute and State University	—	342,796	—	342,796	—	—	—	—
Total Virginia	**92**	**30,059,398**	**82**	**28,413,254**	**7**	**1,367,018**	**3**	**279,126**
Washington								
Asthma, Inc.	2	566,949	1	181,792	—	—	1	385,157
Avatar Design and Development, Inc.	1	120,327	1	120,327	—	—	—	—
Barlow Scientific	2	464,465	2	464,465	—	—	—	—
Battelle Pacific Northwest Laboratories	1	478,625	1	478,625	—	—	—	—
Fred Hutchinson Cancer Research Center	18	34,987,534	16	8,900,531	—	—	2	26,087,003
Icogen Corporation	1	200,993	1	200,993	—	—	—	—
Institute for Systems Biology	3	6,116,872	1	121,500	—	—	2	5,995,372
King County Public Health Department	1	356,523	1	356,523	—	—	—	—
MathSoft, Inc.	1	99,621	1	99,621	—	—	—	—
Phantoms By Design	2	500,556	2	500,556	—	—	—	—
Puget Sound Blood Center	4	1,021,861	4	1,021,861	—	—	—	—
Quantigraphics, Inc.	2	344,072	2	344,072	—	—	—	—
Seattle Institute for Cardiac Research	2	5,775,358	2	5,775,358	—	—	—	—
Spencer Technologies	1	393,117	1	393,117	—	—	—	—
Syntrix Biosystems, Inc.	1	163,329	1	163,329	—	—	—	—
The Hope Heart Institute	2	454,250	2	454,250	—	—	—	—
Therus Corporation	1	487,265	1	487,265	—	—	—	—
University of Washington	125	69,796,614	109	56,312,042	9	2,960,480	7	3,524,092
Washington State University	4	1,178,871	4	1,178,871	—	—	—	—
Total Washington	**174**	**116,507,202**	**153**	**77,555,098**	**9**	**2,960,480**	**12**	**35,991,624**
West Virginia								
West Virginia University	9	2,491,082	8	2,442,934	1	48,148	—	—
Total West Virginia	**9**	**2,491,082**	**8**	**2,442,934**	**1**	**48,148**	**—**	**—**
Wisconsin								
Blood Center of Southeastern Wisconsin	9	4,537,936	8	4,356,936	1	181,000	—	—
EraGen Biosciences, Inc.	1	98,482	1	98,482	—	—	—	—
Marquette University	1	219,313	1	219,313	—	—	—	—
Medical College of Wisconsin	67	36,797,824	60	30,481,363	4	590,414	3	5,726,047
University of Wisconsin, La Crosse	1	120,790	1	120,790	—	—	—	—
University of Wisconsin, Madison	51	22,835,777	45	20,710,673	5	1,448,741	1	676,363
Total Wisconsin	**130**	**64,610,122**	**116**	**55,987,557**	**10**	**2,220,155**	**4**	**6,402,410**

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Wyoming								
University of Wyoming	1	140,500	1	140,500	—	—	—	—
Total Wyoming	**1**	**140,500**	**1**	**140,500**	**—**	**—**	**—**	**—**
Puerto Rico								
Ponce School of Medicine	1	126,631	1	126,631	—	—	—	—
Universidad Central del Caribe	—	183,265	—	183,265	—	—	—	—
University of Puerto Rico, Mayaguez	—	204,751	—	204,751	—	—	—	—
University of Puerto Rico Medical Sciences	1	607,560	1	607,560	—	—	—	—
University of Puerto Rico, Rio Piedras	1	402,472	1	402,472	—	—	—	—
Total Puerto Rico	**3**	**1,524,679**	**3**	**1,524,679**	**—**	**—**	**—**	**—**
Total US	**5,765**	**2,533,054,391**	**5,077**	**2,159,982,970**	**456**	**84,906,750**	**232**	**288,164,671**
Australia								
Child Health Research Institute	1	175,000	1	175,000	—	—	—	—
Children's Hospital at Westmead	1	108,000	1	108,000	—	—	—	—
National Centre/HIV Epidemiology Clinical Research	1	200,000	1	200,000	—	—	—	—
Peter MacCallum Cancer Institute	1	175,000	1	175,000	—	—	—	—
Royal Melbourne Hospital	1	175,000	1	175,000	—	—	—	—
St. Vincent's Institute of Medical Research	1	103,380	1	103,380	—	—	—	—
University of Sydney	2	317,600	2	317,600	—	—	—	—
University of Western Australia	1	243,000	1	243,000	—	—	—	—
Victor Chang Cardiac Research Institute	2	142,364	1	95,944	1	46,420	—	—
Total Australia	**11**	**1,639,344**	**10**	**1,592,924**	**1**	**46,420**	**—**	**—**
Belgium								
Flanders Interuniversity Institute of Biotechnology	2	216,608	1	175,000	1	41,608	—	—
Free University of Brussels	1	297,000	1	297,000	—	—	—	—
University of Antwerp	1	124,263	1	124,263	—	—	—	—
Total Belgium	**4**	**637,871**	**3**	**596,263**	**1**	**41,608**	**—**	**—**
Brazil								
Federal University of Bahia	—	39,000	—	39,000	—	—	—	—
Total Brazil	**—**	**39,000**	**—**	**39,000**	**—**	**—**	**—**	**—**
Canada								
Clinical Research Institute of Montreal	3	655,629	3	655,629	—	—	—	—
Hospital for Sick Children, Toronto	4	960,290	3	746,838	—	—	1	213,452
London Health Sciences Center	1	32,093	—	—	—	—	1	32,093
McGill University	1	300,000	1	300,000	—	—	—	—

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
McMaster University	2	2,048,704	—	—	—	—	2	2,048,704
Ontario Cancer Institute	1	200,000	1	200,000	—	—	—	—
Ottawa Health Research Institute	1	250,000	1	250,000	—	—	—	—
Sunnybrook Health Sciences Center	1	199,403	1	199,403	—	—	—	—
UHN Toronto General Hospital	1	360,600	1	360,600	—	—	—	—
University Health Network	1	250,000	1	250,000	—	—	—	—
University of Calgary	2	291,357	2	291,357	—	—	—	—
University of British Columbia	1	225,000	1	225,000	—	—	—	—
Total Canada	**19**	**5,773,076**	**15**	**3,478,827**	**—**	**—**	**4**	**2,294,249**
China								
Chinese Center, Disease Control and Prevention	—	24,300	—	24,300	—	—	—	—
Total China	**—**	**24,300**	**—**	**24,300**	**—**	**—**	**—**	**—**
Finland								
University of Helsinki	1	250,000	1	250,000	—	—	—	—
University of Turku	1	49,864	—	—	1	49,864	—	—
Total Finland	**2**	**299,864**	**1**	**250,000**	**1**	**49,864**	**—**	**—**
India								
Center for DNA Fingerprinting/ Diagnostics	—	39,000	—	39,000	—	—	—	—
Total India	**—**	**39,000**	**—**	**39,000**	**—**	**—**	**—**	**—**
Israel								
Technion-Israel Institute of Technology	3	509,533	2	494,032	1	15,501	—	—
Total Israel	**3**	**509,533**	**2**	**494,032**	**1**	**15,501**	**—**	**—**
Italy								
University of Parma	1	369,543	1	369,543	—	—	—	—
Total Italy	**1**	**369,543**	**1**	**369,543**	**—**	**—**	**—**	**—**
Netherlands								
Erasmus University of Rotterdam	1	216,000	1	216,000	—	—	—	—
State University at Groningen	1	270,000	1	270,000	—	—	—	—
University of Amsterdam	1	56,308	—	—	1	56,308	—	—
Total Netherlands	**3**	**542,308**	**2**	**486,000**	**1**	**56,308**	**—**	**—**
Russia								
Central Institute for Tuberculosis	1	150,000	1	150,000	—	—	—	—
Total Russia	**1**	**150,000**	**1**	**150,000**	**—**	**—**	**—**	**—**

Institution	Totals		Grants		Research Training and Career Development		Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Sweden								
Migramed	1	452,144	1	452,144	—	—	—	—
Total Sweden	**1**	**452,144**	**1**	**452,144**	**—**	**—**	**—**	**—**
Thailand								
Chiang Mai University	—	16,200	—	16,200	—	—	—	—
Total Thailand	**—**	**16,200**	**—**	**16,200**	**—**	**—**	**—**	**—**
United Kingdom								
King's College London	1	250,000	1	250,000	—	—	—	—
MRC Dunn Human Nutrition Unit	1	56,308	—	—	1	56,308	—	—
University College London	1	281,149	1	281,149	—	—	—	—
University of Bristol	1	487,123	1	487,123	—	—	—	—
University of Cambridge	1	296,256	1	296,256	—	—	—	—
University of Edinburgh	1	200,000	1	200,000	—	—	—	—
University of Leicester	1	41,608	—	—	1	41,608	—	—
University of London National Heart and Lung Institute	1	332,263	1	332,263	—	—	—	—
University of Sheffield	1	125,000	1	125,000	—	—	—	—
University of Southampton	1	309,750	1	309,750	—	—	—	—
Total United Kingdom	**10**	**2,379,457**	**8**	**2,281,541**	**2**	**97,916**	**—**	**—**
Total Other	**55**	**$ 12,871,640**	**44**	**$ 10,269,774**	**7**	**$ 307,617**	**4**	**$ 2,294,249**
Grand Total	**5,820**	**$2,545,926,031**	**5,121**	**$2,170,252,744**	**463**	**$85,214,367**	**236**	**$290,458,920**

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.

Minority Institution Faculty Mentored Research Scientist Development Award (K01): To support at minority institutions faculty members who have the interest and potential to conduct state-of-the-art research in the areas of 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 (RCDA) (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 (RCA) (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, and the Nutrition Academic Award. Currently, only the Sleep Academic Award and the Nutrition Academic Award programs are being supported.

Clinical Investigator Development Award (CIDA) (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 as a means to encourage clinical investigators to engage in research in specific areas designated by the Institute.

Physician Scientist Award (PSA) (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.

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 (MBRS) 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.

Historical Black College and University Scientist Award (UH1): To strengthen and augment the human resources at historically black colleges and universities (HBCUs) 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 services(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
ACES	Azithromycin and Coronary Events Study
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
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
CHF	congestive heart failure
CHS	Cardiovascular Health Study
COBLT	Cord Blood Stem Cell Transplantation Study
COPD	chronic obstructive pulmonary disease
CSCC	Comprehensive Sickle Cell Centers
CVD	cardiovascular diseases
DBDR	Division of Blood Diseases and Resources
DECA	Division of Epidemiology and Clinical Applications
DHHS	Department of Health and Human Services
DHVD	Division of Heart and Vascular Diseases
DIR	Division of Intramural Research
DLD	Division of Lung Diseases
EDUC	Enhanced Dissemination and Utilization Center
ENRICHD	Enhancing Recovery in Coronary Heart Disease
ESCAPE	Evaluation Study of Congestive Heart Failure and Pulmonary Artery Catheterization Effectiveness
FDA	Food and Drug Administration
FHS–SCAN	Family Heart Study–Subclinical Atherosclerosis Network
FIRST	First Independent Research Support and Transition
FORTE	Feasibility of Retinoid Treatment in Emphysema
FY	fiscal year
GEMS	Girls Health Enrichment Multisite Studies
GOCADAN	Genetics of Coronary Artery Disease in Alaskan Natives

HAT	Home Automatic External Defibrillator Trial
HBCU	historically black colleges and universities
HDL	high-density lipoprotein
HEIRS	Hemochromatosis and Iron Overload Screen Study
HEW	Department of Health, Education, and Welfare (now HHS)
HHS	Health and Human Services (formerly HEW)
HIV	human immunodeficiency virus
HT	hormone therapy
ICD	International Classification of Diseases; also, implantable cardiac defibrillator
JHS	Jackson Heart Study
LAM	lymphangioleiomyomatosis
LDL	low-density lipoprotein
MARC	Minority Access to Research Careers
MBRS	Minority Biomedical Research Support
MERIT	Method to Extend Research in Time
MESA	Multi-Ethnic Study of Atherosclerosis
MGS	Mammalian Genotyping Service
MI	myocardial infarction
MRI	magnetic resonance imaging
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
NIDDK	National Institute of Diabetes and Digestive and Kidney Diseases
NIDDM	noninsulin-dependent diabetes mellitus
NIH	National Institutes of Health
NIMH	National Institute of Mental Health
NLMS	National Longitudinal Mortality Study
NO	nitric oxide
NRSA	National Research Service Award
OAR	Office of AIDS Research
OAT	Occluded Artery Trial
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	Public Access Defibrillation
PAHI	Pan American Hypertension Initiative

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-II	Prospective Investigation of Pulmonary Embolism Diagnosis-II
PTCA	percutaneous translumina coronary angioplasty
R&D	research and development
REDS	Retrovirus Epidemiology Donor Study
RFA	Request for Applications
RFP	Request for Proposals
RMS	research management and support
RPG	research project grant
SANDS	Stop Atherosclerosis in Native Diabetic Study
SBIR	Small Business Innovation Research
SCD	sickle cell disease
SCCOR	Specialized Centers of Clinically Oriented Research
SCD-HeFT	Sudden Cardiac Death in Heart Failure Trial
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
STOP	Stroke Prevention in Sickle Cell Anemia
STTR	Small Business Technology Transfer
TAAG	Trial of Activity for Adolescent Girls
TB	tuberculosis
WAVE	Women's Angiographic Vitamin and Estrogen Trial
WHI	Women's Health Initiative
WHL	World Health League
WLM	Weight Loss Maintenance
WISE	Women's Ischemia Syndrome Evaluation
WHO	World Health Organization

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