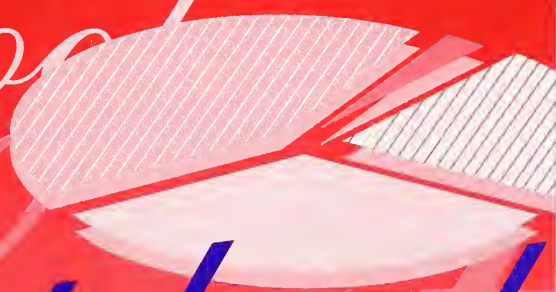


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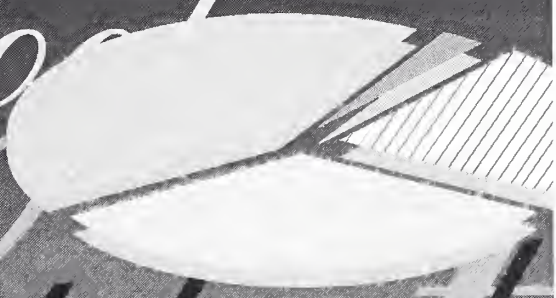
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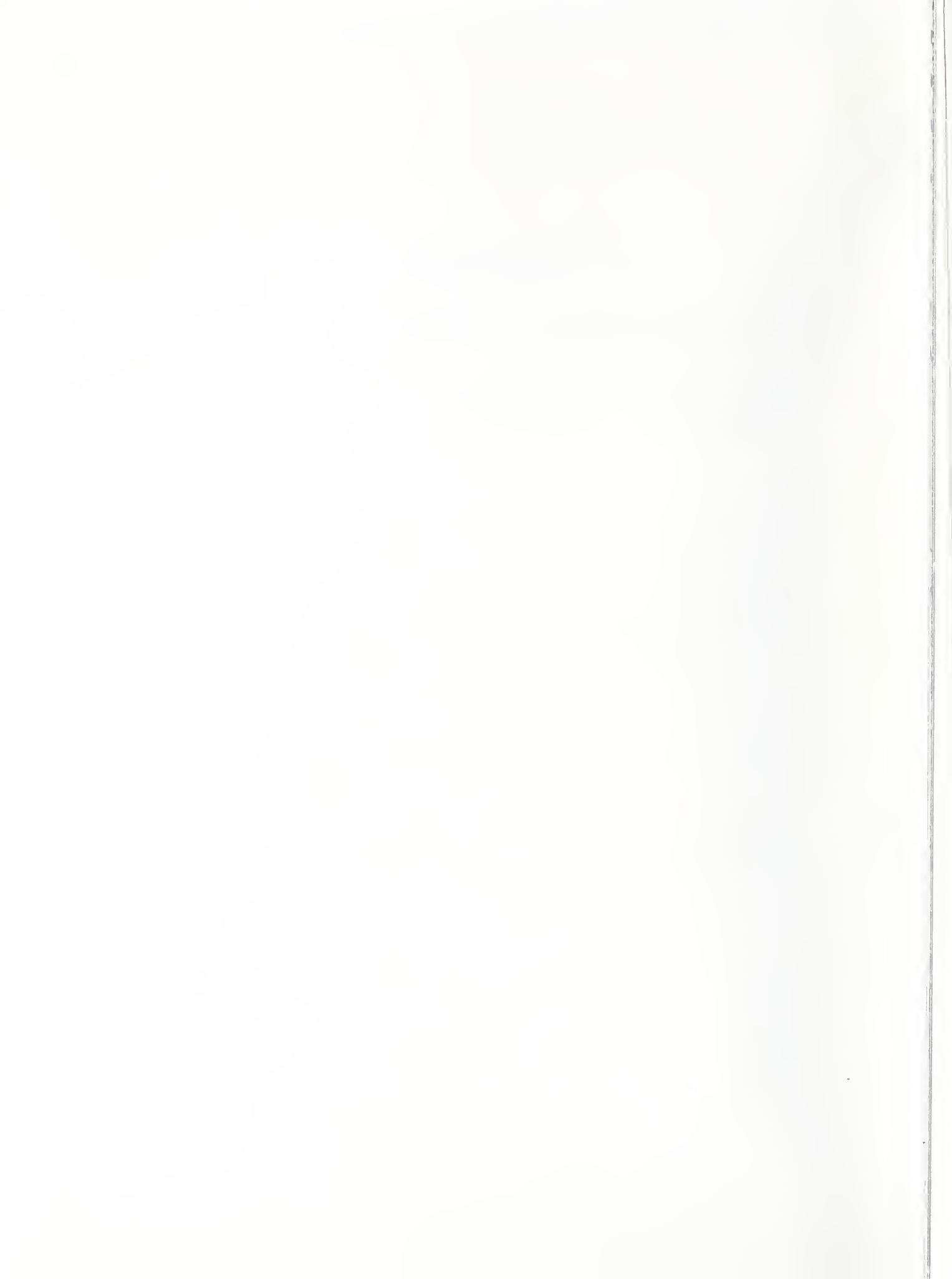
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1. Directory of Personnel*

Office of the Director	Bldg.	Room	Phone	MSC†,‡
Director, Claude Lenfant, M.D.	31	5A52	496-5166	2486
Acting Deputy Director, John T. Watson, Ph.D.	31	5A49	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	4A11	496-3245	2490
Associate Director for Administrative Management, Donald Christoferson	31	5A48	496-2411	2490
Associate Director for Scientific Program Operation, Carl A. Roth, Ph.D., LL.M.	31	5A03	496-6331	2482
Associate Director for Prevention, Education, and Control, Gregory J. Morosco, Ph.D., M.P.H.	31	4A03	496-5437	2480
Associate Director for International Programs, Ruth J. Hegyeli, M.D.	31	4A07	496-5375	2490
Office of Special Concerns Director, Mishyelle I. Croom	31	4A28	496-1763	2490
Office of Administrative Management				
Director/Executive Officer, Donald Christoferson	31	5A48	496-2411	2490
Deputy Executive Officer, James R. Wehling	31	5A48	496-2411	2490
Office of Technology Transfer and Development, Chief, Jonathan Gottlieb, Ph.D.	31	1B30	402-5579	2490
Management Policy and Administrative Services Branch				
Acting Chief, Suzanne Anthony	31	5A33	496-9737	2490
Freedom of Information Coordinator, Suzanne Anthony	31	5A33	496-9737	2490
Privacy Act Coordinator, Suzanne Anthony	31	5A33	496-9737	2490
Financial Management Branch				
Chief, John C. Tibbs	31	5A48	496-4653	2490
Personnel Management Branch				
Chief, Barry Rubinstein	31	5A28	496-6477	2484
Extramural Administrative Management Branch				
Chief, Christinia E. Roark	RKL2§	7026	435-6373	7921
Intramural Administrative Management Branch				
Chief, Hillel Soclof	10	7N220	496-2157	1670
National Center on Sleep Disorders Research				
Director, James P. Kiley, Ph.D.	RKL2	10038	435-0199	7920
Administrative Officer, Jan P. Montoya	RKL2	7026	435-6373	7921
Women's Health Initiative				
Acting Director, Suzanne S. Hurd, Ph.D.	RKL2	10122	435-0233	7952
Administrative Officer, Valery D. Gheen	31	5A33	496-5931	2490
Office of Prevention, Education, and Control				
Director, Gregory J. Morosco, Ph.D., M.P.H.	31	4A03	496-5437	2480

* Current as of October 15, 1998. For locating personnel not listed, the general information number is 301-496-4000. The Personnel Directory, which is periodically updated throughout the year, is located on the NHLBI Gopher Server under NHLBI Organization and Staff.

† MSC—Mail Stop Code.

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

§ RKL2—Rockledge II Building.

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Health Communications and Information Science				
Senior Manager, Terry C. Long	31	4A03	496-0554	2480
Public Health Program Development				
Senior Manager, Robinson Fulwood, M.S.P.H.	31	4A03	496-0554	2480
National High Blood Pressure Education Program				
Coordinator, Edward J. Roccella, Ph.D., M.P.H.	31	4A16	496-1051	2480
National Cholesterol Education Program				
Coordinator, James I. Cleeman, M.D.	31	4A16	496-1051	2480
National Asthma Education and Prevention Program				
Coordinator, Robinson Fulwood, M.S.P.H.	31	4A03	496-0554	2480
National Heart Attack Alert Program				
Coordinator, Mary McDonald Hand, R.N., M.S.	31	4A16	496-1051	2480
National Obesity Education Initiative				
Coordinator, Karen Donato, M.S., R.D.	31	4A16	496-1051	2480
Office of Science and Technology				
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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				
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Director, Barbara Liu, S.M.	31	5A06	496-9899	2482
Information Resources and Technology Program				
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Division of Heart and Vascular Diseases				
Director, Michael J. Horan, M.D., Sc.M.	RKL2	9160	435-0466	7940
Deputy Director, Stephen C. Mockrin, Ph.D.	RKL2	9170	435-0477	7940
Administrative Officer, Lisa A. Freeny	RKL2	7110	435-6373	7921
Heart Research Program				
Director, Patrice Desvigne-Nickens, M.D.	RKL2	9158	435-0494	7940
Senior Scientific Advisor, Frank D. Altieri, Ph.D.	RKL2	9166	435-0494	7940
Arrhythmias Scientific Research Group				
Leader, Peter M. Spooner, Ph.D.	RKL2	9192	435-0504	7940
Bioengineering Scientific Research Group				
Acting Leader, Alan Berson, Ph.D.	RKL2	9178	435-0513	7940
Heart Function and Disease Research Group				
Leader, John L. Fakunding, Ph.D.	RKL2	9200	435-0505	7940
Clinical Medicine Research Group				
Leader, George Sopko, M.D.	RKL2	9176	435-0515	7940
Training and Special Programs Scientific Research Group				
Leader, Michael A. Commarato, Ph.D.	RKL2	9204	435-0535	7940
Vascular Research Program				
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Atherosclerosis Scientific Research Group				
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Hypertension Scientific Research Group				
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Vascular Biology and Medicine Scientific Research Group				
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Training and Special Programs Scientific Research Group				
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Division of Lung Diseases				
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Deputy Director, Carol E. Vreim, Ph.D.	RKL2	10120	435-0233	7952
Administrative Officer, Kathryn Lightbody	RKL2	7120	435-6373	7921
Airway Biology and Disease Program				
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Senior Scientific Advisor,				
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Asthma Scientific Research Group				
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Chronic Obstructive Pulmonary Disease/Environment Scientific Research Group				
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Cystic Fibrosis Scientific Research Group				
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Sleep and Neurobiology Scientific Research Group				
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Training and Special Programs Scientific Research Group				
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Lung Biology and Disease Program				
Director, Dorothy B. Gail, Ph.D.	RKL2	10100	435-0222	7952
Senior Scientific Advisor, Robert A. Musson, Ph.D.	RKL2	10108	435-0222	7952
Acquired Immunodeficiency Syndrome/Tuberculosis Scientific Research Group				
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Developmental Biology and Pediatrics Scientific Research Group				
Leader, Mary Anne Berberich, Ph.D.	RKL2	10102	435-0222	7952
Immunology/Fibrosis Scientific Research Group				
Leader, Robert A. Musson, Ph.D.	RKL2	10108	435-0222	7952
Lung Cell and Vascular Biology Scientific Research Group				
Leader, Dorothy B. Gail, Ph.D.	RKL2	10100	435-0222	7952
Training and Special Programs Scientific Research Group				
Leader, Mary S. Reilly, M.S.	RKL2	10112	435-0222	7952

Division of Blood Diseases and Resources	Bldg.	Room	Phone	MSC
Acting Director, Elaine Sloand, M.D.	RKL2	10160	435-0080	7950
Deputy Director, Carol H. Letendre, Ph.D.	RKL2	10162	435-0080	7950
Administrative Officer, Kathryn Lightbody	RKL2	7026	435-6373	7921
Program Analysis Officer, Susan Pucie	RKL2	10166	435-0584	7950
Blood Resources Program				
Director, Henry Chang, M.D.	RKL2	10170	435-0065	7950
Transfusion Medicine Scientific Research Group				
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Bone Marrow Transplantation Scientific Research Group				
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Thrombosis and Hemostasis Scientific Research Group				
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Blood Diseases Program				
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Cellular Hematology Scientific Research Group				
Leader, Charles Peterson, M.D.	RKL2	10158	435-0050	7950
Training and Special Programs				
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Division of Epidemiology and Clinical Applications				
Director, Lawrence M. Friedman, M.D.	RKL2	8100	435-0422	7938
Deputy Director, Peter Savage, M.D.	RKL2	8104	435-0422	7938
Senior Advisor, Gerald Payne, M.D.	RKL2	8102	435-0422	7938
Nutrition Coordinator, Nancy Ernst, Ph.D., R.D.	RKL2	8112	435-0422	7938
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Clinical Trials Scientific Research Group				
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Behavioral Medicine Scientific Research Group				
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Epidemiology and Biometry Program				
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Jackson Epidemiology Research Unit				
Leader, Cecil Burchfiel, Ph.D.	350 W. Woodrow Wilson Drive Jackson, MS 39213 (601) 815-5060			

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Genetic Epidemiology Scientific Research Group				
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Committee Management Officer, Kathryn M. Valeda	RKL2	7220	435-0255	7922
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Senior Scientific Review				
Advisor, Louis M. Ouellette, Ph.D.	RKL2	7200	435-0310	7924
Special Assistant, Louise P. Corman, Ph.D.	RKL2	7180	435-0270	7924
Cardiology/Pulmonary Scientific Review Group				
Leader, Deborah Beebe, Ph.D.	RKL2	7178	435-0270	7924
Blood/Vascular Scientific Review Group				
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Clinical Studies and Training Scientific Review Group				
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Heart, Lung, and Vascular Diseases Section				
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Blood Diseases and Resources Section				
Chief, Patricia E. Davis	RKL2	6136	435-0355	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, William W. Darby	RKL2	7160	435-0144	7926
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Lung Diseases Section				
Chief, Raymond L. Zimmerman	RKL2	7154	435-0171	7926
Blood Diseases and Resources Section				
Chief, Jane R. Davis	RKL2	7174	435-0166	7926
Division of Intramural Research				
Director, Edward D. Korn, Ph.D.	10	7N214	496-2116	1668
Clinical Director, (Vacant).	10	8C103	496-1518	1754
Pathology Section				
Chief, Victor J. Ferrans, M.D., Ph.D.	10	2N240	402-0908	1518
Administrative Officer, Hillel Soclof	10	7N220	496-2157	1670
Deputy Administrative Officer, Carroll Hanson	10	7N220	402-1985	1670
Cardiology Branch				
Acting Chief, Richard O. Cannon, M.D.	10	7B15	496-5817	1650
Cardiac Catheterization Section				
Chief, Richard O. Cannon, M.D.	10	7B15	496-9985	1650

Division of Intramural Research (cont'd.)	Bldg.	Room	Phone	MSC
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Inherited Cardiovascular Disease Section				
Chief, Neal D. Epstein, M.D.	10	8N112	496-2102	1650
Echocardiography Section				
Chief, Julio Panza, M.D.	10	7S247	496-2634	1650
Hematology Branch				
Chief, Neal S. Young, M.D.	10	7C103	496-5093	1652
Hypertension-Endocrine Branch				
Chief, (Vacant)	10	8C103	496-1518	1754
Molecular Disease Branch				
Chief, H. Bryan Brewer, M.D.	10	7N117	496-5095	1666
Cell Biology Section				
Chief, (Vacant)	10	7N114	496-3195	1666
Experimental Atherosclerosis Section				
Chief, Howard S. Kruth, M.D.	10	5N113	496-4826	1422
Molecular Biology Section				
Chief, Silvia M. Santamarina-Fojo, M.D., Ph.D.	10	7N108	496-6050	1666
Peptide Chemistry Section				
Chief, H. Bryan Brewer, M.D.	10	7N117	496-5095	1666
Molecular Hematology Branch				
Acting Chief, Brian Safer, M.D., Ph.D.	10	7D18	496-5844	1654
Protein Biosynthesis Section				
Chief, Brian Safer, M.D., Ph.D.	10	7D18	496-1284	1654
Pulmonary/Critical Care Medicine Branch				
Chief, Joel Moss, M.D., Ph.D.	10	6D03	496-1597	1590
Biochemical Physiology Section				
Chief, Vincent Manganiello, M.D., Ph.D.	10	5N323	496-1594	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
Molecular Mechanism 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	5D17	496-2057	1590
Laboratory of Animal Medicine and Surgery				
Chief, Robert F. Hoyt, Jr., D.V.M., M.S.	14E	106B	496-9673	5570
Laboratory of Biochemical Genetics				
Chief, Marshall W. Nirenberg, Ph.D.	36	1C06	496-5208	4036
Cell Differentiation Section				
Chief, Matthew P. Daniels, Ph.D.	36	4C01	496-2898	4036
Macromolecules Section				
Chief, Alan Peterkofsky, Ph.D.	36	4C09	496-2408	4036
Molecular Biology Section				
Chief, Marshall W. Nirenberg, Ph.D.	36	1C06	496-5208	4036
Laboratory of Biochemistry				
Chief, P. Boon Chock, Ph.D.	3	222	496-2073	0340
Enzymes Section				
Chief, Earl R. Stadtman, Ph.D.	3	222	496-4096	0342
Intermediary Metabolism and Bioenergetics Section				
Chief, Thressa C. Stadtman, Ph.D.	3	108	496-3002	0320
Protein Chemistry Section				
Chief, R. Ann Ginsburg, Ph.D.	3	208	496-1278	0340

Division of Intramural Research (cont'd.)	Bldg.	Room	Phone	MSC
Metabolic Regulation Section				
Chief, P. Boon Chock, Ph.D.	3	222	496-2073	0340
Protein Function in Disease Section				
Chief, Rodney L. Levine, M.D., Ph.D.	3	106	496-2310	0320
Laboratory of Biophysical Chemistry				
Chief, Henry M. Fales, Ph.D.	10	7N318	496-2135	1676
Chemical Structure Section				
Chief, Henry M. Fales, Ph.D.	10	7N318	496-2135	1676
Structural Biophysics Section				
Chief, James A. Ferretti, Ph.D.	3	412	496-3341	0380
Laboratory of Cardiac Energetics				
Chief, Robert S. Balaban, Ph.D.	10	B1D161	496-3658	1061
Laboratory of Cell Biology				
Chief, Edward D. Korn, Ph.D.	3	B1-22	496-1616	0301
Cellular Physiology Section				
Chief, Evan Eisenberg, M.D., Ph.D.	3	B1-23	496-2846	0301
Cellular Biochemistry and Ultrastructure Section				
Chief, Edward D. Korn, Ph.D.	3	B1-22	496-1616	0301
Membrane Enzymology Section				
Chief, Richard W. Hendler, Ph.D.	3	B1-06	496-2610	0301
Molecular Cell Biology Section				
Chief, John A. Hammer, III, Ph.D.	3	B1-18	496-8960	0301
Optical Spectroscopy Section				
Chief, Jay R. Knutson, Ph.D.	10	5D40	496-2557	1412
Laboratory of Cell Signaling				
Chief, Sue Goo Rhee, Ph.D.	3	120	496-9646	0320
Laboratory of Kidney and Electrolyte Metabolism				
Chief, Maurice B. Burg, M.D.	10	6N260	496-3187	1598
Osmotic Regulation Section				
Chief, Arlyn Garcia-Perez, Ph.D.	10	6N260	496-1559	1603
Renal Cellular and Molecular Biology Section				
Chief, Maurice B. Burg, M.D.	10	6N260	496-3187	1598
Renal Mechanisms Section				
Chief, Mark A. Knepper, M.D., Ph.D.	10	6N312	496-3064	1598
Transport Physiology Section				
Chief, Kenneth R. Spring, Ph.D.	10	6N309	496-3236	1598
Laboratory of Molecular Cardiology				
Chief, Robert S. Adelstein, M.D.	10	8N202	496-1865	1762
Cellular and Molecular Motility Section				
Chief, James R. Sellers, Ph.D.	10	8N117	496-6887	1760
Muscle Molecular Biology Section				
Chief, Robert S. Adelstein, M.D.	10	8N202	496-1865	1762
Laboratory of Molecular Immunology				
Chief, Warren J. Leonard, M.D.	10	7N252	496-0098	1674
Intracellular Signaling Section				
Chief, Michael A. Beaven, Ph.D.	10	8N114	496-6188	1760
Lymphocyte Activation Section				
Chief, Warren J. Leonard, M.D.	10	7N252	496-0098	1674
Molecular and Cellular Toxicology Section				
Chief, Lance R. Pohl, Ph.D.	10	8N115	496-4841	1760

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Building 10, Room ____
10 Center Drive, MSC* ____
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NHLBI, NIH
Building 14E, Room ____
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* 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 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. 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, blood diseases, and sleep disorders conducted in its own laboratories and by scientific institutions and individuals supported by research grants and contracts. It plans and directs research in development, trial, and evaluation of interventions and devices related to prevention, treatment, and rehabilitation of patients suffering from such diseases and disorders. The Institute conducts research on clinical use of blood and all aspects of the management of blood resources. It supports research training and career 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. It coordinates with other research institutes and all Federal health programs rele-

vant activities in the above areas, including the related causes of stroke. It conducts educational activities, including development and dissemination of materials for health professionals and the public in the above areas, with emphasis on prevention. In addition, it 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.

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). While the NHLBI has primary responsibility for the WHI, it is run by a consortium that includes the National Cancer Institute, the National Institute on Aging, and the National Institute of Arthritis and Musculoskeletal and Skin Diseases. The Divisions and the Center pursue their own scientific mission but cooperate in areas of shared interest such as prevention, education, and control. The extramural Divisions and the Center use a variety of funding mechanisms, including research grants, program project grants, contracts, centers, and research training programs. Descriptions of the Division and Center programs follow.

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

Heart and Vascular Diseases	Lung Diseases	Blood Diseases and Resources
<i>Heart Research</i> Arrhythmias Bioengineering Ischemic Heart Disease Congenital and Infectious Diseases Heart Failure Interventional Cardiology <i>Vascular Research</i> Molecular Genetics and Medicine Atherosclerosis Hypertension Vascular Biology and Medicine	<i>Airway Biology and Disease</i> Asthma Chronic Obstructive Pulmonary Disease and Environment Cystic Fibrosis Neurobiology and Sleep <i>Lung Biology and Disease</i> Acquired Immunodeficiency Syndrome and Tuberculosis Critical Care and Acute Lung Injury Developmental Biology and Pediatrics Immunology and Fibrosis Lung Cell and Vascular Biology	<i>Blood Diseases</i> Sickle Cell Disease Cellular Hematology <i>Blood Resources</i> Transfusion Medicine Bone Marrow Transplantation Thrombosis and Hemostasis
Epidemiology and Clinical Applications	National Center on Sleep Disorders Research	Intramural Research
<i>Clinical Applications and Prevention</i> Prevention Clinical Trials Behavioral Medicine <i>Epidemiology and Biometry</i> Field Studies and Clinical Epidemiology Social and Environmental Epidemiology Analytical Resources Genetic Epidemiology	Sleep Sleep Disorders and Related Conditions Women's Health Initiative	Cardiology Hematology Hypertension-Endocrine Molecular Disease Molecular Hematology Pulmonary-Critical Care Medicine Animal Medicine and Surgery Biochemical Genetics Biochemistry Biophysical Chemistry Cardiac Energetics Cell Biology Cell Signaling Kidney and Electrolyte Metabolism Molecular Cardiology Molecular Immunology

Division of Heart and Vascular Diseases

An estimated 58.8 million Americans have CVD, 35 million of whom are less than 65 years of age. Hypertension affects 50 million Americans. Approximately 12 million Americans have coronary heart disease (CHD), almost 6 million have congestive heart failure (CHF), 4 million have cerebrovascular disease, and 2 million have peripheral vascular diseases. About 8 million Americans with CVD are limited in activity. In 1997, about 41 percent of all deaths (952,000) were attributed to CVD, and 52 percent of them

occurred in women. The economic cost to the Nation in 1999 is projected to be an estimated \$286 billion, of which \$178 billion will be for health expenditures and \$108 billion will be for lost productivity.

The DHVD plans and directs an integrated and coordinated research program, with an emphasis on advancing knowledge of the causes of heart and vascular diseases and on their prevention, diagnosis, and treatment. The strategy for implementation of its goals provides a balance of activities across the continuum of biomedical research, with an emphasis on fundamental

mechanisms. 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's increased emphasis on heart failure research is a reflection of the aging U.S. population and the increased survival from other forms of heart disease due to advances in the field of CHD. From 1982 to 1995, the number of hospitalizations attributed to CHF doubled to 872,000. In 1996, almost 44,000 deaths were primarily associated with heart failure and another 240,000 had it as a secondary cause. To address the urgent need for more research in this area, the DHVD released an initiative in FY 1998 encouraging new approaches in the investigation of the pathogenesis of heart failure. A second initiative was released that requested clinical studies to determine whether a pulmonary artery catheterization (PAC)-directed treatment strategy is more effective than a non-PAC treatment strategy in reducing morbidity and mortality in patients with advanced CHF. Information provided by this clinical trial may provide a rational basis for safe and effective therapy for patients with severe CHF.

Heart disease, atherosclerosis, and hypertension are other areas of emphasis for the Division. A variety of approaches and collaborative disciplines that coordinate basic and clinical scientists with wide-ranging expertise are used to pursue research goals. In FY 1998, the Division released an initiative to stimulate interest in the interrelationship of atherosclerosis and hypertension. Its aim is to identify pathways by which either one of these conditions might influence the severity of the other.

The Division is participating with 13 other NIH Institutes and Centers to develop a genetic map of the rat genome. By combining their efforts, scientists can more effectively, and at reduced cost, gather critical genomic resources and tools that will lead to identification of genetic factors involved in disease processes. The DHVD is supporting an Expressed Sequence Tag (EST) component to the Rat Genome Project that will determine the sequence of approximately 25,000 genes. The development of a rat EST map will

allow researchers to work with both the human and rat genomes to find genes, understand their role in disease, and develop new therapeutic and prevention approaches to human disease.

Scientists have shown that lipoprotein(a) [Lp(a)] is a strong and independent predictor for development of coronary and cerebrovascular disease. Presently, neither adequate standardization of the Lp(a) assay nor generally accepted reference materials and methods exist, due in large part to the complexity and heterogeneity of the protein structure. To address these concerns, the Division recently initiated a program to develop and validate a standardized reference method to measure plasma concentrations of Lp(a).

The DHVD continues to place a high priority on selected population groups such as women, minorities, and children. In addition to ensuring that women and minorities are appropriately represented in all clinical studies, the DHVD has implemented many programs that are specifically targeted to these groups. For example, the Division is supporting a research project to develop safe, efficient, and cost-effective diagnostic approaches for evaluating women with suspected ischemic heart disease. Another project will determine whether antioxidant treatment alone or in combination with hormone replacement therapy (HRT) will stabilize or inhibit progression and induce regression of coronary plaques. Programs targeting minority populations include exploring ethnic differences in autonomic cardiovascular control, testing whether antioxidants are useful in preventing early atherosclerosis in blacks with carotid artery disease, studying ischemic heart disease in blacks, and investigating the molecular genetics of hypertension in blacks. Research programs specifically related to children focus on innovative approaches to elucidate the etiology, pathophysiology, and diagnosis of congenital and acquired CVD in pediatric populations so that more effective methods of treatment and prevention can be developed.

Division of Lung Diseases

Lung diseases are among the leading causes of death and disability in the United States. As an underlying cause, excluding cancer, they account for 239,000 deaths annually and are a contributing factor to perhaps an equal number of additional deaths. More than 25 million persons have

chronic bronchitis, emphysema, asthma, or other obstructive or interstitial lung diseases. In 1996, pulmonary diseases accounted for 26 percent of all hospitalizations of children less than 15 years of age in the United States. The projected economic cost to the Nation in 1999 is about \$127 billion, of which \$88 billion will be for health expenditures and \$39 billion will be for lost productivity.

The DLD plans and directs a coordinated research program on the causes of lung diseases and on their prevention, diagnosis, and treatment. Its activities focus on understanding the structure and function of the respiratory system, increasing fundamental knowledge of mechanisms associated with specific pulmonary disorders, and applying new findings to evolving treatment strategies for patients.

In 1998, the Division sponsored several workshops to identify gaps in existing knowledge and to establish research priorities in selected critical areas. A workshop on airway remodeling and repair in asthma was convened to review and assess the current state of knowledge regarding the chronicity of asthma and the role of airway remodeling. Other workshops were held to develop research strategies in pathogenesis of chronic obstructive pulmonary disease (COPD), retinoid therapy in emphysema, symptom perception and respiratory sensation in asthma, therapeutic approaches for idiopathic pulmonary fibrosis, molecular embryology of lung, and molecular genomic effects of tissue oxygen deprivation and sleep apnea.

Asthma research is an area of high priority for the DLD. The NHLBI, together with the National Institute of Allergy and Infectious Diseases, recently initiated a program to stimulate research on the cellular and molecular mechanisms by which respiratory pathogens contribute to development of childhood asthma. Currently, the etiology of the disease in children is not known, nor is the role of infections in development and persistence of asthma well understood. A program is underway to determine the interrelationship between maternal factors and early life events that influence lung and immune system development and the expression of inflammatory and structural changes in the airways that are characteristic of asthma.

The Division supports an asthma clinical research network to enable rapid assessment of new treatment methods and ensure that findings on optimal management of asthma are rapidly disseminated to practitioners and health care professionals. One clinical trial investigated the long-term effects of two short-acting beta-agonist treatment regimens and another studied the use of colchicine in moderate asthma. Two additional clinical trials are examining the effectiveness and side-effects of a long-acting beta-agonist and corticosteroids. A fifth trial will estimate dose-response curves for six distinct inhaled corticosteroid delivery systems with respect to adrenal suppression.

To promote application of recent scientific findings in the clinical setting, the DLD updated its 1991 clinical practice guidelines for asthma. *The National Asthma Education and Prevention Program's Expert Panel Report 2: Guidelines for the Diagnosis and Management of Asthma* reflects current advances in the understanding and treatment of asthma.

The Division works with other Federal agencies and international organization to coordinate Government activities that disseminate the recommendations included in the guidelines and promote further research. It recently participated in an interagency task force for protecting children from environmental risks and contributed to a Federal strategy for protecting children from environmental factors that worsen their asthma. With its international partners and the World Health Organization (WHO), the Division participated in organizing the "Global Initiative for Asthma (GINA)," a program to increase awareness of asthma and its public health consequences, promote study of the association between asthma and the environment, and reduce asthma morbidity and mortality throughout the world. The GINA practical guides, published by the NHLBI in 1996 and translated into more than 12 languages, provide a foundation for asthma education programs around the world.

The DLD supports a diverse program in sleep apnea that includes basic research to understand the fundamental neurobiology of how breathing is controlled and why breathing stops during sleep apnea; clinical investigations to improve treatments for apnea; and applied studies to examine how apnea is detrimental to

productivity and quality of life. Also supported are a multicenter study to explore clinical and epidemiological relationships between apnea and CVD and a Specialized Center(s) of Research (SCOR) program to encourage interaction between basic scientists and clinical investigators in neurobiology of sleep and sleep apnea.

Smoking-related diseases are a major cause of mortality and morbidity in the United States. The Division supports a range of research on smoking-related diseases from mechanisms of pathogenesis and genetic susceptibility to clinical trials. Clinical trials include evaluation of smoking cessation methods; long-term impact of smoking cessation on morbidity and mortality in those with abnormal lung function; effect of inhaled corticosteroids on lung function in continuing smokers; and efficacy of lung volume reduction surgery. In addition to research on smoking-induced lung disease, the Division supports research on mechanisms of environmental lung disease.

The DLD is a strong supporter of acquired immunodeficiency syndrome (AIDS) research. Included in its portfolio are studies that examine cellular and molecular events involved in regulation of human immunodeficiency virus (HIV) activation in lung; host factors controlling individual susceptibility to HIV-associated lung disease such as tuberculosis, fungal infections, *Pneumocystis carinii* pneumonia, and pulmonary Kaposi's sarcoma; and regulation of pulmonary immune defenses in HIV disease.

The Division continues to support an acute respiratory distress syndrome (ARDS) clinical network that is evaluating the efficacy of different therapeutic strategies such as mechanical ventilation and anti-inflammatory agents including corticosteroids in the treatment of critically ill patients with ARDS. Private industry is collaborating with the network on some of the therapies. Other ongoing programs focus on causes and environmental and genetic risk factors for sarcoidosis, causes of noninfectious pneumonia associated with bone marrow transplantation, cellular and molecular mechanisms of primary pulmonary hypertension, and creation of a molecular profile of bronchopulmonary dysplasia that will advance understanding of the condition and lead to the development of clinical interventions.

Programs recently initiated by the Division include basic studies to investigate genetic, cellular, and molecular mechanisms regulating alveolar formation and to determine whether similar principles apply to the induction of alveolar regeneration after lung injury; a national patient registry to obtain information on lymphangiomyomatosis (LAM), a rare progressive lung disease that affects almost exclusively young women of childbearing age; and multidisciplinary research studies to enable rapid application of basic science findings to clinical problems in three discrete areas—acute lung injury, neurobiology of sleep and sleep apnea, and airway biology and pathogenesis of cystic fibrosis.

Other activities supported by the Division include research training and career development programs to provide postdoctoral opportunities for beginning investigators, prevention programs to extend important services to communities, and demonstration and education activities to transfer basic research and clinical findings to health care professionals and patients. The Tuberculosis Academic Award (TBAA) Minority Medical School Partnerships is a new program to enhance the existing TBAA Program in minority medical schools. Emphasis is on development and implementation of curriculum changes, and establishment of education programs and community outreach programs in tuberculosis education at minority schools.

Support for all the activities of the Division constitute not less than 15 percent of the funds allocated to the NHLBI, as required by legislation.

Division of Blood Diseases and Resources

Blood diseases, including both acute and chronic disorders, resulted in 261,000 deaths in 1997; 251,000 of them were due to thrombotic disorders and 10,000 were due to diseases of the red blood cells and bleeding disorders. In 1999, thrombotic disorders and other blood diseases will cost an estimated \$82 billion, of which \$51 billion will be for health expenditures and \$31 billion for lost productivity.

Blood resources include nearly two dozen products; they are derived from more than 14 million units of whole blood collected from almost 9 million American donors. In 1994, an estimated 11 million units of blood were

transfused to 3.4 million patients. Adverse effects following blood transfusion include development of hepatitis C—the risk being about 1:103,000 per unit of blood or blood products transfused. The risk of being infected with HIV is estimated to be 1:493,000 per unit. Universal screening of donor blood for antibodies to HIV began in 1985, and universal screening for antibodies to hepatitis C virus began in 1990. The screening tests, which have been improved over the years, have greatly reduced the risk of infection to transfusion recipients.

The DBDR has a dual role within the Institute. It develops, administers, and coordinates programs to reduce morbidity and mortality caused by blood diseases and to lead to their primary prevention. Diseases addressed include hemophilia, Cooley's anemia, sickle cell disease (SCD), and disorders of hemostasis and thrombosis. A new program in stem cell and marrow transplantation has been established to determine conditions for effective transplantation. The Division also has a major responsibility to ensure the adequacy and safety of the Nation's blood supply. A full range of activities, including studies of transmission of disease through transfusion, development of methods to inactivate viruses in donated blood, improvement of blood donor screening procedures, research to reduce human error in transfusion medicine, and studies of emerging diseases that may be transmitted by blood transfusion, are used to achieve this goal.

The dissemination of research findings to the medical community through workshops, conferences, and consensus development conferences is an important function of the Division. Topics have included plasma transfusion, platelet transfusion therapy, diagnosis of deep-vein thrombosis, impact of routine HIV antibody testing of blood and plasma donors on public health, infectious disease testing for blood transfusions, stem cell therapy, immune function in SCD, and management of patients with hepatitis C.

In 1998, the Division sponsored several workshops to review progress in selected areas and to develop strategies for future research. Investigators met to identify new research opportunities in transfusion therapy. Separate workshops were also convened to discuss the current scientific and clinical experience with granulocyte transfusion products and to evaluate the efficacy of platelet

transfusion products and platelet substitutes. Clinicians and basic scientists assembled to assess recent advances and to recommend future directions in the genetic, molecular, and cellular aspects of a stem cell clonal disorder called paroxysmal nocturnal hemoglobinuria and its relationship to aplastic anemia. Scientists studying bone marrow transplantation and factors affecting engraftment gathered to review current clinical data on stem cell therapy and to evaluate clinical assays that measure successful stem cell engraftment.

Finding an effective therapy for SCD remains a high priority. One strategy, transfusion therapy, has been shown to be useful in reducing strokes in SCD patients. Progress in the area of treatment, however, has not lead to an universally effective therapeutic agent. The drug hydroxyurea, although promising, may have long-term side effects and its safety and efficacy in children are unknown. A clinical study to address these questions is being developed.

In 1998, the Cord Blood Banking and Transplantation Study began with the goal of banking cord blood units to determine whether cord blood cells instead of bone marrow can be used for transplantation. Minority populations are especially being targeted.

To meet its overall responsibilities, the Division maintains an integrated and coordinated program of grants, contracts, training and career development awards, and academic awards. SCORs in thrombosis, transfusion medicine, and hematopoietic stem cell biology and Comprehensive Centers in SCD are currently supported.

Division of Epidemiology and Clinical Applications

The DECA has the primary responsibility for epidemiological studies, clinical trials, and prevention studies in heart and vascular, lung, and blood diseases and for basic and applied research in behavioral medicine. The Division identifies research opportunities; stimulates and conducts research on causes, prevention, diagnosis, and treatment of the diseases; and assesses the need for technologic development in acquisition and application of research findings in these areas. It evaluates and uses basic and clinical research findings in defined populations (such as

occupational groups, school children, health professionals, and minorities) and community settings, with an emphasis on studies of primary and secondary prevention in nonhospitalized patients or populations.

Genetic epidemiology is an important component of the research program. The Division has expanded several ongoing longitudinal studies to include genetic studies in an effort to improve understanding of the interaction between genetics and the environment. One study conducted in both high risk and random families is testing candidate genes in search for new genes linked to CVD. Genetic and environmental factors associated with CVD and CVD risk factors in American Indians is the subject of another study. A new program with similar objectives involving blacks was recently initiated. It consists of a single-site epidemiological study like those previously established in Framingham, MA, and Honolulu, HI. The prevalence, and genetic and environmental determinants of iron overload and hereditary hemochromatosis are the focus of another new program. It will investigate the feasibility and potential benefits and risks of primary care-based screening and intervention.

Development of techniques to detect and evaluate subclinical CVD is also an important area of investigation. An observational study to determine characteristics related to progression of subclinical to clinical disease was recently initiated. Scientists will compare new to established measures of subclinical disease. Ultimately, the goal is to develop noninvasive, population-based methods that can be used in screening and intervention studies for identifying asymptomatic persons at greatest risk for clinical events.

The Division supports research that examines whether other possible diet-related factors besides the established direct relationships of body weight, salt intake, and alcohol intake and the inverse relationship of potassium intake to blood pressure may have independent effects on blood pressure. An international epidemiological study is investigating the relationship of macronutrients and other dietary factors in the development of unfavorable blood pressure levels in middle-aged and older individuals.

Clinical trials are a useful approach to test the efficacy of various drug therapies. Currently, one is underway to determine whether the combined

incidence of nonfatal myocardial infarction (MI) and fatal CHD differs between hypertensives receiving diuretics and those receiving alternative antihypertensive pharmacological treatment. In this trial, a subset of hypercholesterolemic patients is being examined to determine whether reducing serum cholesterol levels with a lipid-lowering drug decreases the incidence of mortality from all causes. Other issues under investigation are the effect on mortality of beta-blockers compared with standard therapy for chronic CHF, effect on mortality of two strategies of antiarrhythmic drug therapy in patients with atrial fibrillation, and effect on mortality of an angiotensin-converting enzyme inhibitor in patients with good ventricular function following an MI. A clinical trial was recently initiated on the effectiveness of intravenous magnesium therapy in reducing mortality in patients undergoing initial evaluation for suspected acute MI.

Behavioral studies are an important component of clinical trials and have been included in several intervention projects. Among the ones being supported by the Division are the following: a multicenter study involving 20 U.S. communities to examine the effect of community-wide education on reducing the time from onset of cardiac symptoms to receipt of medical care; a study to evaluate the effectiveness of behavioral interventions in primary health care settings to encourage sedentary patients to increase their physical activity; and a clinical trial to investigate the effects of psychosocial support on morbidity and mortality in patients recently hospitalized with acute MI.

National Center on Sleep Disorders Research

The NCSDR was established in response to the NIH Revitalization Act of 1993 (P.L. 103-43) to support research, training, health information dissemination, and other activities with respect to sleep and sleep disorders. Areas of emphasis include basic understanding of sleep, biological and circadian rhythm research, sleep disorders, and other sleep-related research. The NCSDR coordinates its activities with those of other NIH components, Federal agencies, and for-profit and non-profit organizations.

The Sleep Disorders Research Advisory Board advises the Director, NIH; the Director, NHLBI; and the Director, NCSDR, on planning, executing,

and evaluating research in sleep and sleep disorders. It had an active role in preparing a sleep research plan with the NCS DR for the NIH that encompasses basic, clinical, and applied research; health education; and prevention-related research in sleep and sleep disorders. The Plan was released by the NIH Director in March 1996. Presently, the Advisory Board is working on a variety of initiatives related to the genetics of sleep and sleep disorders.

Sleep apnea is a disorder that affects many individuals. It has been implicated as a risk factor for the development of hypertension, ischemic heart disease, and cerebral infarction. To investigate the cardiovascular consequences of sleep apnea, the NCS DR began a program built upon established epidemiological studies. Using baseline data previously gathered on hypertension, obesity, and other cardiovascular risk factors in existing cohorts, the study will determine the degree to which sleep apnea is an independent or contributing risk factor for the development of cardiovascular and cerebrovascular disease.

In 1998, a joint initiative with the National Institute of Child Health and Human Development (NICHD) and the National Institute of Dental Research was issued to encourage research in airway abnormalities responsible for obstructive sleep apnea in children. To stimulate additional research in sleep apnea, the NCS DR recently cosponsored a workshop with the American Thoracic Society on the molecular and genomic effects of tissue oxygen deprivation. The purpose was to identify specific research directions on the effects of tissue oxygen deprivation on sleep mechanisms.

Two new training programs were initiated in 1998. One seeks to encourage basic science and clinical research training in sleep, and the other seeks to develop or improve medical curricula, physician/patient/nurse and community education, and clinical practice for prevention, management, and control of sleep disorders.

The NCS DR collaborates on a number of NIH- and Government-wide activities. An example is a partnership with the Department of Transportation (DoT) and the National Sleep Foundation for the "Drive Alert...Arrive Alive" program. An expert panel report on *Drowsy Driving and Automobile Crashes* was published with the DoT in 1998. The NCS DR and the DoT are continuing

their drowsy driving prevention efforts, with a focus on shift workers and young people. A series of educational materials for high school students and teachers on sleep and the danger of drowsy driving were distributed through Scholastic, Inc. A strategy development workshop was held on educating youth about the importance of sleep and the dangers of sleep deprivation, especially drowsy driving. A report of the workshop proceedings will be available in 1999.

The NCS DR works closely with the NHLBI Office of Prevention, Education, and Control on the sleep education program. Several new public and professional education materials were recently developed and disseminated. A mass media campaign on sleep apnea continued with the production and distribution of radio public service announcements. A publication, *Problem Sleepiness in Your Patient*, was developed and printed in cooperation with the American Sleep Disorders Association (ASDA). In collaboration with ASDA, the NCS DR convened a working group to identify key messages for primary care physicians about insomnia in their patients; *Insomnia: Assessment and Management in Primary Care* will be available for dissemination in 1999.

Women's Health Initiative

On October 1, 1997, the WHI was transferred to the NHLBI. It was originally established by the NIH in 1991 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 observation study to identify predictors of disease, and a study of community approaches to develop healthful behaviors. The clinical trial and the observational study, consisting of more than 167,000 women aged 50 to 79, will seek to answer questions on benefits and risks of HRT, changes in dietary patterns, and calcium/vitamin D supplements in disease prevention. Specifically, the HRT part of the clinical trial will study the effects of HRT on heart disease, osteoporosis-related bone fractures, and breast and endometrial cancer. The trial will

enable scientists to assess both the benefits and risks of the therapy. The dietary modification part will examine the effect of a diet low in fat and high in fruit, vegetables, and grain on heart disease, breast cancer, and colorectal cancer in postmenopausal women. The calcium/vitamin D part will test whether these supplements reduce the risk of colorectal cancer and the frequency of hip and other bone fractures in postmenopausal women.

Women who were ineligible or unwilling to participate in the clinical trial were encouraged to enroll in a concurrent long-term observational study to delineate new risk factors and biological markers for diseases, allow comparison with the clinical trial cohort findings, evaluate temporal relationship between risk factors and disease outcomes, and improve estimates of known predictors of disease by sociodemographic factors. About 100,000 women are expected to participate.

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 and Pacific Islanders, and American Indians.

The community prevention study component will focus on community-based strategies to enhance adoption of healthful behaviors, with a particular emphasis on women of diverse races, ethnic groups, and socioeconomic strata. The goal of this effort is to conduct applied prevention research that will result in model programs that can be widely disseminated. Areas of interest include 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 HRT.

Division of Intramural Research

The NHLBI DIR conducts clinical research on the normal and pathophysiologic functioning of cardiac, pulmonary, blood, and endocrine systems and basic research on normal and abnormal cellular behavior at the molecular level. Research foci of the 16 laboratories and branches range from structural organic chemistry to cardiology.

Major areas of interest include the mechanisms of gene regulation, retroviral-mediated gene transfer, and gene therapy; the molecular basis of lipoprotein dysfunctions and the atherogenic process; the molecular basis of diseases of the alveolar structures of the lung and the design of new therapeutic modalities; the 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; the biochemistry and physiology of calcium channels; molecular and cellular processes for conversion of metabolic energy into useful work; the molecular basis of transmembrane signaling; the pathophysiology of renal function at cellular and molecular levels; the biochemistry of trace nutrients; enzyme kinetics, metabolic regulation, and protein chemistry; and the cellular and molecular basis of toxicities induced by drugs and other foreign compounds.

The DIR is located on the 300-acre NIH campus in Bethesda. It has a staff of 723, including about 359 doctoral-level scientists, 65 of whom are in tenured and tenure-track positions, one Nobel Laureate, and six members of the National Academy of Sciences. Approximately 150 guest workers contribute importantly to the research. This combined staff occupies a total space of about 115,000 square feet and has the use of 53 beds in the Clinical Center of the NIH.

Office of Prevention, Education, and Control

The NHLBI Office of Prevention, Education, and Control coordinates 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, the Office established health education programs and initiatives that address high blood pressure, high blood cholesterol, obesity, early warning signs of heart attack, asthma, and sleep disorders. The four largest programs have coordinating committees that consist of national medical, public health, and voluntary organizations, and other Federal agencies. The coordinating committees help to plan, implement, and evaluate program efforts in professional, patient, and public

education and spread the message of the programs to a wide range of audiences.

The National High Blood Pressure Education Program (NHBPEP) was initiated in 1972 to reduce death and disability related to high blood pressure. The Program, a cooperative effort among the NHLBI, 44 professional and voluntary health agencies, and state health departments, is a model for national health education programs that has been and continues to be adopted by other national and international groups.

Since its inception, the number of hypertensives aware of their condition has increased four-fold, and four times as many hypertensives are treating and controlling their disease. Data from the National Health and Nutrition Examination Surveys (NHANES) indicate that over the past four decades, mean systolic blood pressure has declined by 10 mm Hg and age-adjusted mortality rates from heart disease and stroke have fallen by 50 and 60 percent, respectively.

Dissemination of national guidelines on prevention of high blood pressure is a major priority of the NHBPEP. A statement on high blood pressure and the need to reduce salt consumption was released by the Program in November 1996 and was accepted by the U.S. Dietary Guidelines Committee. In 1997, the "Sixth Report of the Joint National Committee on the Prevention, Detection, Evaluation, and Treatment of High Blood Pressure" was published in the *Archives of Internal Medicine*. Use of new drug therapies, management of special populations and situations, and patient advocacy and rights are covered in the report. It has been translated into 12 languages and is being used by clinicians worldwide. Teaching slides and continuing education programs for clinicians based on the report have been provided throughout the United States.

Several NHBPEP programs activities target special groups. Examples include developing a network of organizations to advocate improved blood pressure control among older Americans and maintaining blood pressure control among elderly women (with special emphasis on preventing CHF), low-income and minority populations, and those who are underserved by the health care system; working with the Consortium for Southeastern Hypertension Control to reduce mortality from stroke in targeted populations such as those in the "Stroke Belt," a cluster of

southeastern states that have high rates of stroke mortality; and educating the public about benefits of blood pressure control through mass media campaigns and new easy-to-read patient education brochures in English and Spanish.

The National Cholesterol Education Program (NCEP) was initiated in 1985 to educate health professionals and the public about high blood cholesterol as a risk factor for CHD and about the benefits of lowering cholesterol levels to reduce illness and death from CHD. As shown by results from the 1995 Cholesterol Awareness Survey of physicians and the public, the NCEP has made significant progress toward its goal of reducing the prevalence of high blood cholesterol. From 1983 to 1995, the percentage of the public who ever had their cholesterol checked rose from 35 to 75 percent, implying that 70 to 80 million Americans who were unaware of their cholesterol level in 1983 had taken action to learn it by 1995. Moreover, in 1995, physicians reported initiating diet and drug treatment at much lower cholesterol levels than in 1983, levels close to NCEP recommendations, and major elements of the NCEP guidelines for detection and treatment have become established practice.

The NCEP uses a dual strategy for educating the American people on the importance of blood cholesterol reduction. One strategy focuses on individuals whose high blood cholesterol places them at increased risk for CHD and emphasizes the need for detection and treatment. The other strategy focuses on the general public and encourages heart-healthy eating patterns to lower average cholesterol levels. Public service announcements (PSAs) are used to educate the public about the importance of eating a diet low in saturated fat, engaging in physical activity, maintaining weight control, and having regular cholesterol level checkups.

The latest NHANES III data demonstrate that these two educational strategies have had a substantial effect on the decline in blood cholesterol levels of U.S. adults. Since 1978, the public's intake of saturated fat, total fat, and cholesterol decreased significantly, resulting in impressive declines in average blood cholesterol levels and in the prevalence of high blood cholesterol in the U.S. population. Cholesterol levels in adolescents have also declined.

As part of National Cholesterol Education Month in September 1998, the NCEP launched a new interactive Web site to provide individualized information on cholesterol lowering for people with CHD. The site can be accessed by clicking on "Interactive Site: Lowering Cholesterol for People with Heart Disease" under "What's New" on the NHLBI home page at www.nhlbi.nih.gov.

The National Asthma Education and Prevention Program (NAEPP) was initiated in March 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 and prevent disruptions of daily routine, hospitalizations, and the occasional deaths caused by uncontrolled asthma.

Dissemination of national guidelines on diagnosis and management of asthma is a major program priority. To ensure implementation of its clinical practice guideline recommendations, the NAEPP's outreach and education efforts in 1998 focused on collaborating with community-based asthma coalitions. The coalitions consist of representatives from local public health departments, hospital and medical centers, schools, community recreation centers, concerned parents' groups, lung associations, and media. The NAEPP and the coalitions will develop professional, patient, and public education objectives and implement a strategic plan to increase public awareness of asthma as a serious chronic disease, increase asthma management skills among practitioners, and increase patients' adherence to recommendations.

The National Heart Attack Alert Program (NHAAP) was initiated in June 1991 to reduce morbidity and mortality from acute MI, including sudden cardiac death, through education of health professionals (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 and signs. To date, the Program has developed recommendations for emergency department management of individuals presenting with characteristic symptoms of acute MI. It has also prepared background

papers on 911 emergency telephone systems; staffing and equipment requirements for emergency medical services systems; recommended emergency medical dispatching processes and procedures; and identified factors associated with patient/bystander delay in seeking care for acute MI manifestations. In addition, the NHAAP has developed recommendations on current and new tests/technologies for detecting acute MI (including unstable angina) for health care providers in emergency departments. NHAAP also has published recommendations for providers directed at reducing prehospital delay in patients at high risk for an acute MI as well as a paper addressing community planning considerations for ensuring access to timely and appropriate care of individuals with acute coronary syndromes.

Areas identified for increased program activity include evidence-based evaluation of diagnostic technologies, strategies, and protocols to identify patients with acute cardiac ischemia; health care systems and community planning that includes managed care issues; new information technologies; and education outreach to professionals, high-risk patients, and the general public/bystanders.

The NHLBI Obesity Education Initiative (OEI) was started in January 1991 to inform the public and health professionals of 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.

As part of its strategy to focus on persons at high risk, the OEI convened an expert panel to consider the scientific evidence related to identification, evaluation, and treatment of obesity in adults, especially those with other risk factors for CVD. The panel's mission was to develop evidence-based clinical practice guidelines for use by primary health care providers. In collaboration with the National Institute of Diabetes and Digestive and Kidney Diseases' (NIDDK) National Task Force on the Prevention and Treatment of Obesity and the San Antonio Cochrane Center, a member of the Cochrane Collaboration whose mission is to prepare, maintain, and disseminate systematic reviews and meta-analyses of health care interventions, it prepared a set of obesity guidelines, *Clinical Guidelines on the Identification, Treatment, and Evaluation of Overweight and Obesity*

in Adults: Evidence Report, that was released in June 1998. Members of the Coordinating Committees of the NCEP and NHBPEP reviewed and endorsed the guidelines. An abbreviated version, *Practical Guide to the Identification, Treatment, and Evaluation of Overweight and Obesity in Adults*, was developed in cooperation with the North American Association for the Study of Obesity and is a resource to assist primary care providers caring for overweight or obese patients.

The OPEC is responsible for coordinating the activities of the Cardiovascular Health Promotion Project (CHPP), a program created to promote heart-healthy behaviors in children and adolescents, as a means to prevent overweight, high blood pressure, and high blood cholesterol. With its partner, the National Recreation and Park Association, the CHPP developed a national communications campaign that combines community outreach with media promotion. Activities within the project include a series of television PSAs encouraging young people and their families to become and stay physically active and a school-based program that provides elementary school teachers with heart health information, particularly to encourage physical activity among their students.

The NHLBI Ad Hoc Committee on Minority Populations was established in 1975 to facilitate communication between minority communities and the NHBPEP. Its role has since expanded as the Institute developed new education and prevention programs. Presently, the Committee is composed of 17 multiethnic, multidisciplinary health professionals from diverse cultural backgrounds with broad-based expertise in a variety of areas. Representing blacks, Hispanics, American Indians, and Asian and Pacific Islander Americans, it provides direct input on NHLBI minority initiatives.

The OPEC and the Office of Research on Minority Health (ORMH), NIH, are currently collaborating on several projects associated with improving cardiovascular health in minority populations. One such project is the "National Physicians' Network," a national strategy designed to mobilize, train, and equip physicians and other health care practitioners to promote cardiovascular health in the black community through prevention and education programs. To maintain the Network, a Web-based continuing education

and training program for health professionals will be created. A second project, the Latino Community CVD Prevention and Outreach Initiative, "Salud para su Corazón," (Health for Your Heart) is a tested and comprehensive community outreach program to raise awareness and knowledge of CVD and promote heart-healthy behaviors among Hispanics. It uses messages and materials that are culturally and language appropriate and that can be disseminated through numerous channels, including mass media and community outreach by lay health educators (*promotores de salud*). A third project, "Building Healthy Hearts for American Indians and Alaska Natives," is a pilot project to increase knowledge and promote heart health among these populations in three communities: the Laguna Pueblo in New Mexico, the Ponca tribe in Oklahoma, and Native Alaskans served by the Bristol Bay Health Corporation, a nonprofit Native American health provider.

International Activities

The beginning of FY 1998 marked five decades of research achievements in the area of heart, lung, and blood diseases by the NHLBI. Events were held both nationally and internationally to commemorate the occasion. The Institute initiated in a conference to address the growing pandemic of CVD in the Americas under the joint sponsorship of the Pan American Health Organization (PAHO), the WHO, the NHLBI, and the Fogarty International Center. Goals of the conference were to use the occasion of the 50th anniversary of the NHLBI and of the WHO to call attention to the growing pandemic of CVD in the Western Hemisphere and to seek new ways to prevent and control the spread of the disease. A Pan American Hypertension Initiative is being developed as a follow-up to the conference.

Since its beginning, the Institute has fostered a number of important international collaborations, including a series of government-to-government agreements to reduce mortality and morbidity from heart, lung, and blood diseases. These diseases affect hundreds of millions of people worldwide, cost hundreds of billions of dollars annually, and are projected to increase dramatically over the next 20 years according to the 1996 World Health Organization/World Bank study, *The Global Burden of Disease*.

The NHLBI contributes to worldwide plans for prevention and control of cardiovascular, pulmonary, and blood diseases in both developed and developing countries. For example, NHLBI staff members serve as consultants to the WHO, the PAHO, the World Hypertension League, and the Global Initiative on Asthma. The Institute also serves as a WHO Collaborating Center for Cardiovascular Research and Training for the Americas and provides information and data for use throughout the world.

Presently, the NHLBI collaborates with more than 20 countries including Russia, China, Japan, Germany, Italy, Poland, the Czech Republic, Kyrgyzstan, Georgia, Egypt, Pakistan, Korea, Australia, Vietnam, and South Africa. These collaborations include exchanges of scientists and data, joint research projects, comparisons of epidemiological data, joint working meetings, and joint publications in areas of high national and scientific priority to reduce the burden of cardiovascular, lung, and blood diseases. The most significant scientific gains are documented in the Institute's annual reports on international activities.

The Institute's prevention programs have had a major impact on international health policies. The NHLBI's guidelines on hypertension, cholesterol, and asthma have been translated into

many languages for adaptation and use in other countries. The Institute's international collaboration in hypertension control serves as a model for infrastructure building and cost-effective health care approaches for CVD and other emerging chronic disease problems. NHLBI collaborative programs with China, Germany, Poland, and Egypt provide evidence that cardiovascular and pulmonary prevention programs, similar to those successfully implemented in the United States, can be adapted to other countries.

Among the recent international activities in which the Institute participated are the Second Joint U.S.A.-South Africa workshop on Hypertension in Blacks to explore research topics of mutual interest and benefit and develop plans for future collaboration in hypertension in black populations and a joint U.S.-Vietnamese meeting between the Director, NHLBI, and the Vietnamese Minister of Health on aplastic anemia. Plans were developed for continued U.S. collaboration with Blood Transfusion Hematology Institutes in Ho Chi Minh City and Hanoi. American scientists headed by the Deputy Clinical Director, Division of Intramural Research, NHLBI, visited both cities to conduct training seminars and to assess the progress of ongoing joint research activities.



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 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 the 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. An 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 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 Diseases, 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 anniversary.

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 HDFFP, "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 measures to reduce cigarette smoking and to lower blood cholesterol to prevent coronary heart disease (CHD) mortality but raise questions about optimal treatment of mild hypertension.

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

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

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

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

November 1984. An NHLBI-NIH Clinical Center interagency agreement for studies on the transmission of 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 (rt-PA) are published. The new thrombolytic agent rt-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, MA, are presented a tribute by the Assistant Secretary for Health, Health and Human Services (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. Acquired immunodeficiency syndrome 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, National Cancer Institute, 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 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 age 60 years significantly reduces stroke and MI.

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

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

mental 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 21, 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. 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 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 finding 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 Trial 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, 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 1, 1997. The Women's Health Initiative, initiated in 1991, is transferred to the NHLBI.

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.

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*.



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, asthma, chronic obstructive pulmonary disease (COPD), and blood-clotting disorders: embolisms and thromboses. The most serious atherosclerotic diseases are coronary heart disease (CHD), as manifested by heart attack and angina pectoris, and cerebrovascular disease, as manifested by stroke.

In 1997 cardiovascular, lung, and blood diseases accounted for 1,189,000 deaths and 51 percent of all deaths in the United States (p. 33). The projected economic cost in 1999 for these diseases is expected to be \$424 billion, 25 percent of the total economic costs of illness, injuries, and death (p. 48). Of all diseases, heart disease is the leading cause of death, cerebrovascular disease is third (behind cancer), and COPD ranks fourth (p. 36). Cardiovascular and lung diseases account for 3 of the 5 leading causes of death (p. 36) and 4 of the 5 leading causes of infant death (p. 42). Hypertension, heart disease, asthma, and chronic bronchitis are especially prevalent and account for substantial morbidity in Americans of all ages (p. 44). Increases in prevalence have been greatest for asthma and congestive heart failure 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 last 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 delay death. While 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.

In this year's Fact Book, a new standard, the projected population for the year 2000, has been used to determine the death rates for the age-adjusted charts found on pages 37, 38, 39, and 41. The corresponding charts that were age-adjusted

to the old standard—the 1940 standard—can be found in the Appendixes. For the international charts, the European Standard Population was used to age-adjust the death rates.

Cardiovascular Diseases

- CVD caused 952,000 deaths in 1997, 41 percent of all deaths (p. 33).
- Heart disease is the leading cause of death; the main form, CHD, caused 466,000 deaths in 1997 (pp. 34, 36).
- The annual number of deaths from CVD increased substantially between 1900 and 1970 (p. 35). This trend ended even though the population continues to increase and age.
- Total CVD mortality from all ages combined, measured by the crude death rate, changed from an increasing to a decreasing trend with a peak in 1963. By 1995, the rate achieved was similar to the rate in 1936 (p. 35).
- Cerebrovascular disease, the third leading cause of death, accounted for 160,000 deaths in 1997 (pp. 34, 36).
- Heart disease is second only to all cancers combined in years of potential life lost (p. 36).
- Among minority groups, heart disease ranks first and stroke ranks fifth or higher as the leading causes of death (p. 36).
- The steep decline in age-adjusted death rate for CVD means a substantial reduction in annual risk of death for an individual of any age. The smaller reduction in crude death rates reflects the impact of an aging population that is growing over time, so that the overall national mortality burden of CVD remains at a high level compared with other causes of death (pp. 35, 37).
- The rapid increase in deaths due to CHF between 1968 and 1996 is a major exception to the mortality decline in CVD (p. 37).
- Between 1985 and 1996, heart disease and stroke declined for men and women in almost all race/ethnic groups. Exceptions involved death rate for stroke, where the rate did not change in American Indian women and increased in Asian men (p. 38).

- Because of the rapid decline in mortality from CHD since the peak in 1963, there were 651,000 fewer deaths from CHD in 1997 than would have occurred if there had been no decline (p. 39).
- Substantial improvements have been made in the treatment of CVD. Since 1970, case-fatality rates from hospitalized CHD, stroke, and CHF patients declined appreciably (p. 39).
- The decline in CHD mortality began earlier in the United States than in most countries, and in the 1970s and 1980s outpaced that in most countries (only selected countries are shown (p. 40).
- Between 1987 and 1997, the percent decline in death rates for CHD was greatest among white males and least among black females (p. 41).
- An estimated 58.8 million persons in the United States have some form of CVD; 50 million have hypertension and about 12 million have CHD (p. 44).
- Since the 1960s there has been a substantial reduction in the prevalence of hypertension, smoking, and cholesterol, but not overweight (p. 45).
- In 1988 and 1994, many more people with a high level of hypertension were aware of their condition and had it treated and controlled compared with individuals with hypertension in previous years (p. 46).
- Hospitalization rates for CHF increased between 1971 and 1996 (p. 47).
- The estimate of economic cost of CVD is expected to be \$286 billion in 1999:
 - \$178 billion in direct health expenditures
 - \$26 billion in indirect cost of morbidity
 - \$82 billion in indirect cost of mortality (p. 48)

Lung Diseases

- Lung diseases, excluding lung cancer, caused an estimated 239,000 deaths in 1997 (p. 33).
- COPD caused 105,000 deaths in 1997 and is the fourth leading cause of death (pp. 34, 37).
- Between 1987 and 1997, the percent increase in death rates for COPD and asthma was greater in women than in men (p. 41).
- Between 1979 and 1997, infant death rates for the various lung diseases declined substantially (p. 41).
- The four leading causes of infant mortality are lung diseases or have a lung disease component (p. 42). Between 1986 and 1996, changes in deaths for the causes were:
 - Congenital anomalies (-25%)
 - Disorders of short gestation (+16%)
 - Sudden infant death syndrome (-44%)
 - Respiratory distress syndrome(-61%)
- Lung diseases accounted for 42 percent of all deaths under 1 year of age in 1997 (p. 42).
- Trends in COPD mortality in the United States are increasing rapidly in women and are flat for men. A selection of countries shows that the death rate for women in the United States is increasing significantly compared with the rates in several other countries (p. 43).
- Asthma is a common chronic condition, particularly in children. Prevalence and mortality continue to increase (pp. 44, 45, 47).
- Asthma and emphysema are leading chronic conditions causing limitation of activity (not shown). Asthma is the fourth leading chronic condition causing bed disability days.

Blood Diseases

- An estimated 261,000 deaths, 11 percent of all deaths, were attributed to blood diseases in 1997. This includes:
 - 251,000 due to blood clotting disorders
 - 8,000 to diseases of the red blood cell
 - 2,000 to bleeding disorders (pp. 33, 34)
- A large proportion of deaths from acute MI and cerebrovascular disease involve blood-clotting problems (p. 34). Mortality trends are downward (p. 33).
- In 1999, blood-clotting disorders are expected to cost the Nation's economy \$71 billion, and other blood diseases will cost \$11 billion (p. 48).
- The mean age at death for persons with sickle cell anemia increased from about 28 years in 1979 to 33 years in 1995 (not shown).
- Each year, an estimated 14 million units of blood are collected from about 8 million donors and transfused to 4 million patients (not shown).

Deaths From All Causes and Deaths From Cardiovascular, Lung, and Blood Diseases, U.S., 1977 and 1997

Cause of Death	1977		1997	
	Number of Deaths	Percent of Total	Number of Deaths	Percent of Total
All Causes	1,900,000	100	2,315,000	100
All Cardiovascular, Lung, and Blood Diseases	1,115,000	59	1,189,000	51
Cardiovascular Diseases (CVD)	985,000	53	952,000	41
Blood	382,000*	20	261,000‡	11
Lung	144,000†	8	239,000†	10
All Other Causes	785,000	41	1,126,000	49

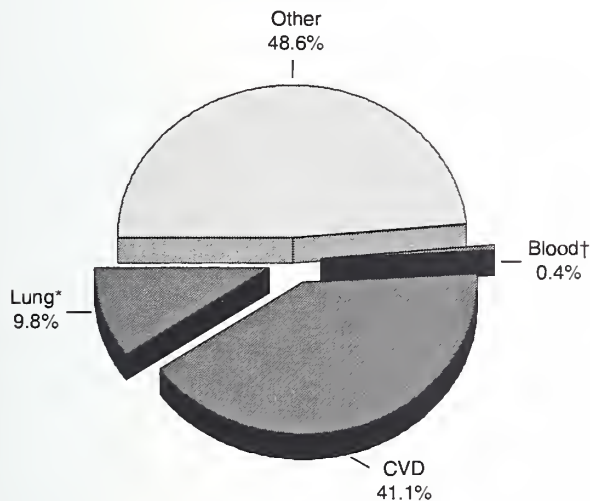
* Includes 376,000 CVD deaths involving blood clotting.

† Includes 12,000 CVD deaths due to pulmonary heart disease in 1977 and 12,000 in 1997.

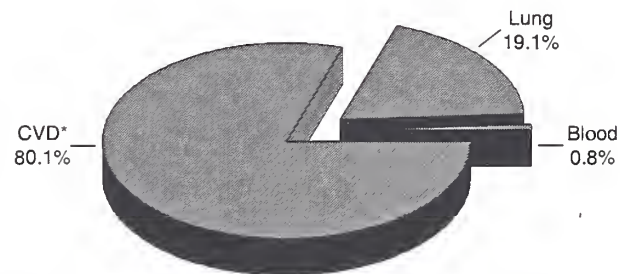
‡ Includes 251,000 CVD deaths involving blood-clotting disease.

Source: Vital statistics of the U.S., National Center for Health Statistics (NCHS). Figures for 1997 are estimated by the NHLBI.

Deaths by Major Causes, U.S., 1997



Deaths From Cardiovascular, Lung, and Blood Disease, U.S., 1997



* CVD involving blood clotting (21.1%).

■ Total Cardiovascular, Lung, and Blood Diseases 51.4%

* Excludes deaths from pulmonary heart disease.

† Excludes deaths from blood-clotting disorders and pulmonary embolism (11.1%).

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

Deaths From Specific Cardiovascular, Lung, and Blood Diseases, U.S., 1997

Cause of Death	Deaths (Thousands)		
	Cardiovascular	Lung	Blood
Acute Myocardial Infarction (AMI)	206	—	140*
Other Coronary Heart Disease (CHD)	260	—	—
Cerebrovascular Diseases (Stroke)	160	—	99*
Other Atherosclerosis	44	—	3*
Pulmonary Embolism	9	9*	9*
Other Cardiovascular Diseases	273	3*	—
Diseases of the Red Blood Cell	—	—	8
Bleeding Disorders	—	—	2
Chronic Obstructive Pulmonary Disease (COPD)	—	105	—
Asthma	—	5	—
Other Airway Diseases	—	1	—
Pneumonia and Influenza	—	88	—
Neonatal Pulmonary Disorders	—	12	—
Interstitial and Inhalation Lung Diseases	—	11	—
Other Lung Diseases	—	5	—
Total†	952	239	261

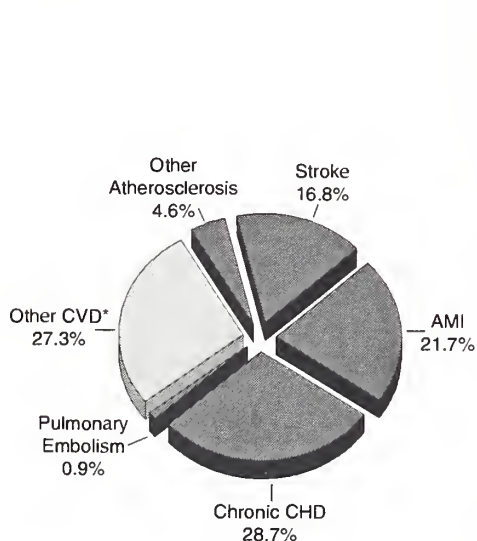
* Deaths from clotting or pulmonary disorders also included as cardiovascular deaths.

† Numbers may not add to total due to rounding.

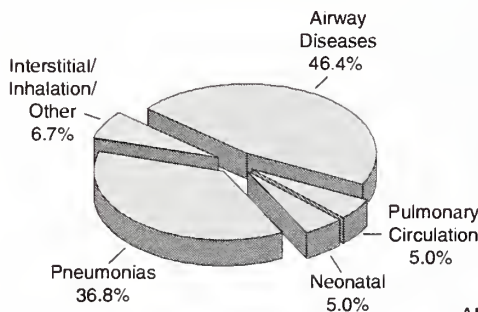
Note: Total, excluding overlap, is 1,189,000.

Source: Vital statistics of the U.S., NCHS. Figures shown are estimated by the NHLBI.

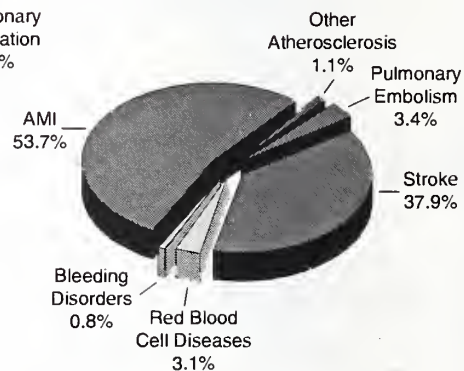
Deaths From Cardiovascular Diseases, U.S., 1997



Deaths From Lung Diseases, U.S., 1997



Deaths From Blood Diseases, U.S., 1997



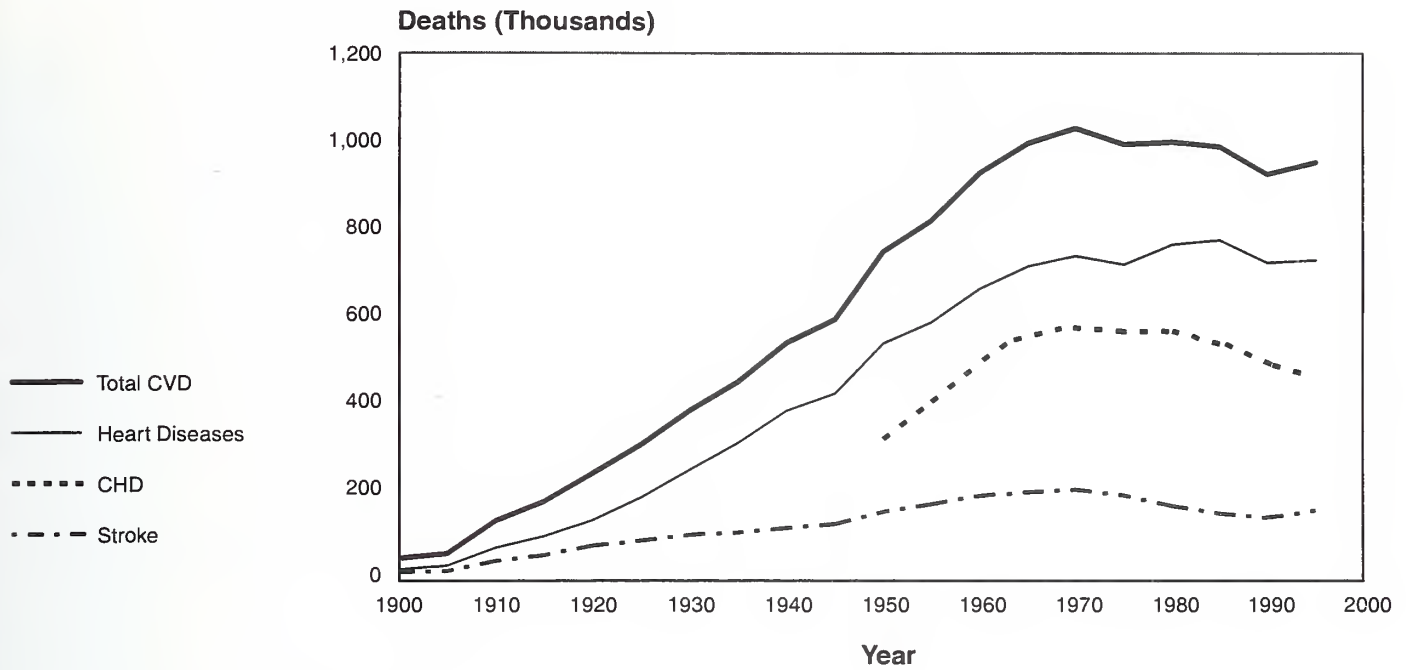
■ Atherosclerosis-Related Diseases 72.7%

■ Blood-Clotting Disorders 96.1%

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

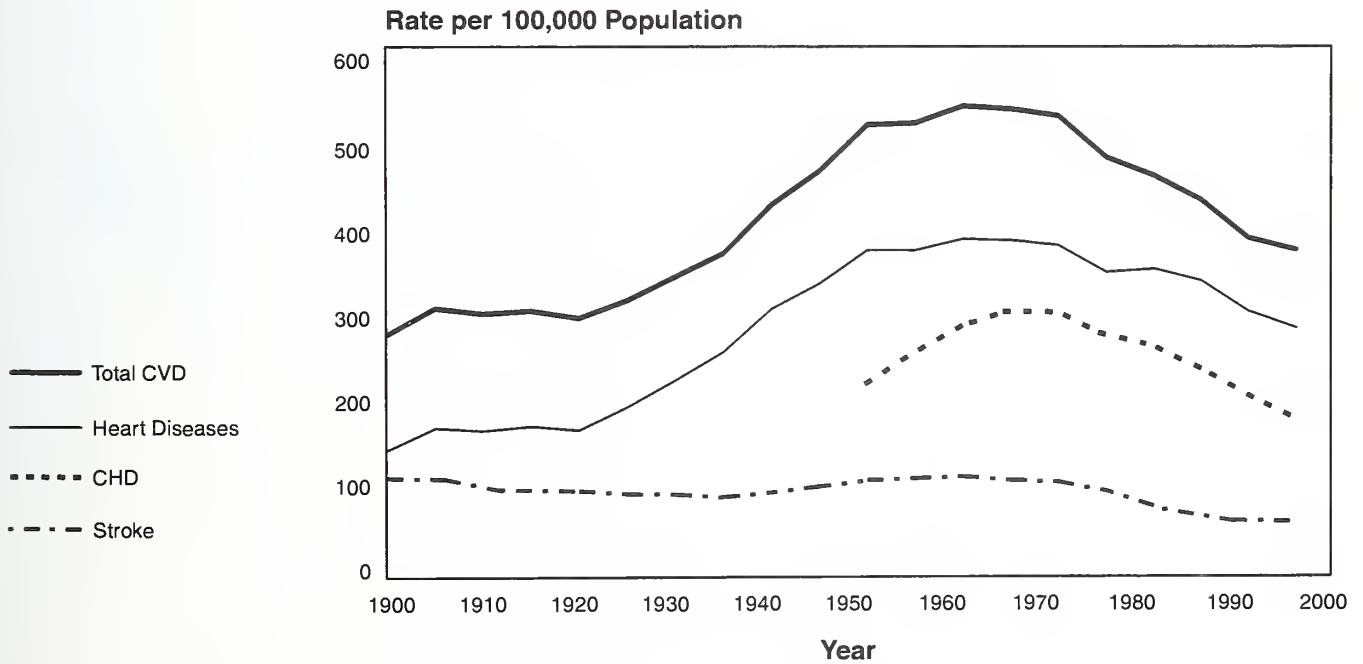
Source: Vital statistics of the U.S., NCHS. Figures shown are estimated by the NHLBI.

Deaths From Cardiovascular Diseases, U.S., 1900-97



Source: Vital statistics of the U.S., NCHS.

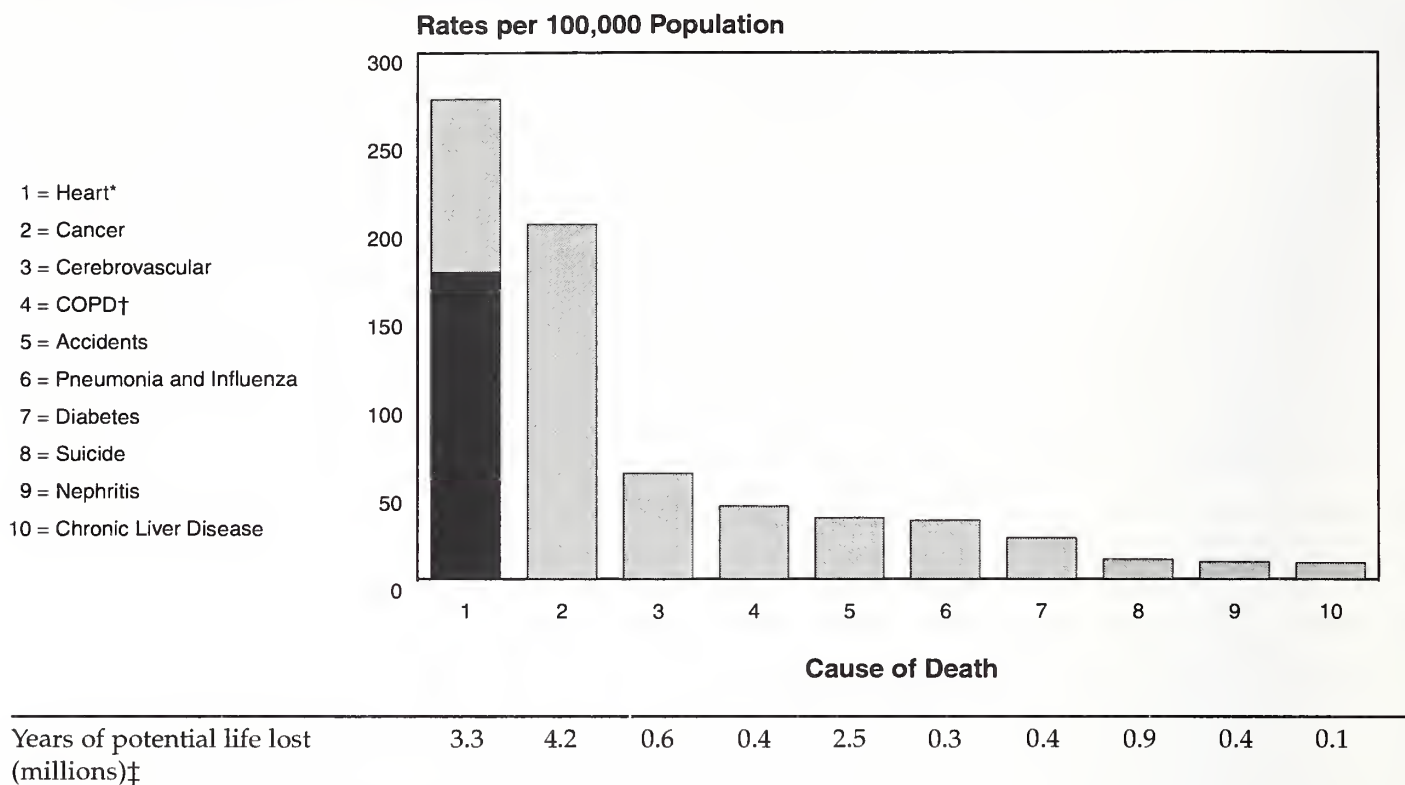
Death Rates* for Cardiovascular Diseases, U.S., 1900-97



* Not age-adjusted.

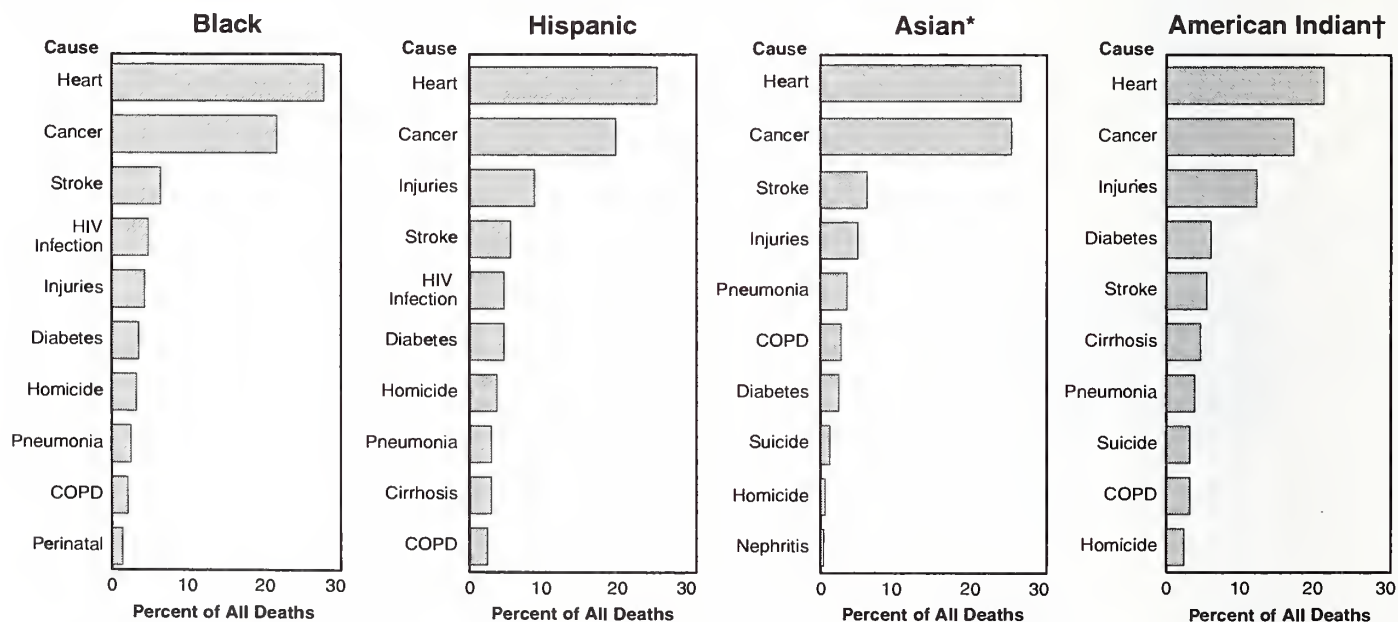
Source: Vital statistics of the U.S., NCHS.

Ten Leading Causes of Death: Death Rates, U.S., 1997



* Includes 174 deaths per 100,000 population from CHD.
 † COPD and allied conditions (including asthma).
 ‡ Based on the average remaining years of life up to age 75 years.
 Source: Vital statistics of the U.S., NCHS (provisional).

Ten Leading Causes of Death Among Minority Groups, U.S., 1996



* Includes deaths among individuals of Asian extraction and Asian-Pacific Islanders.
 † Includes deaths among Aleuts and Eskimos.
 Source: Vital statistics of the U.S., NCHS.

Death Rates for Cardiovascular and Noncardiovascular Diseases, U.S., 1977 and 1997

Cause of Death	Rate*		Rate Change	Percent Change
	1977	1997†		
All Causes	1,052	887	-165	-16
Cardiovascular Diseases	571	366	-205	-36
Coronary Heart Disease	324	180	-144	-44
Stroke	110	62	-48	-44
Other	137	124	-13	-9
Noncardiovascular Diseases	481	521	40	8

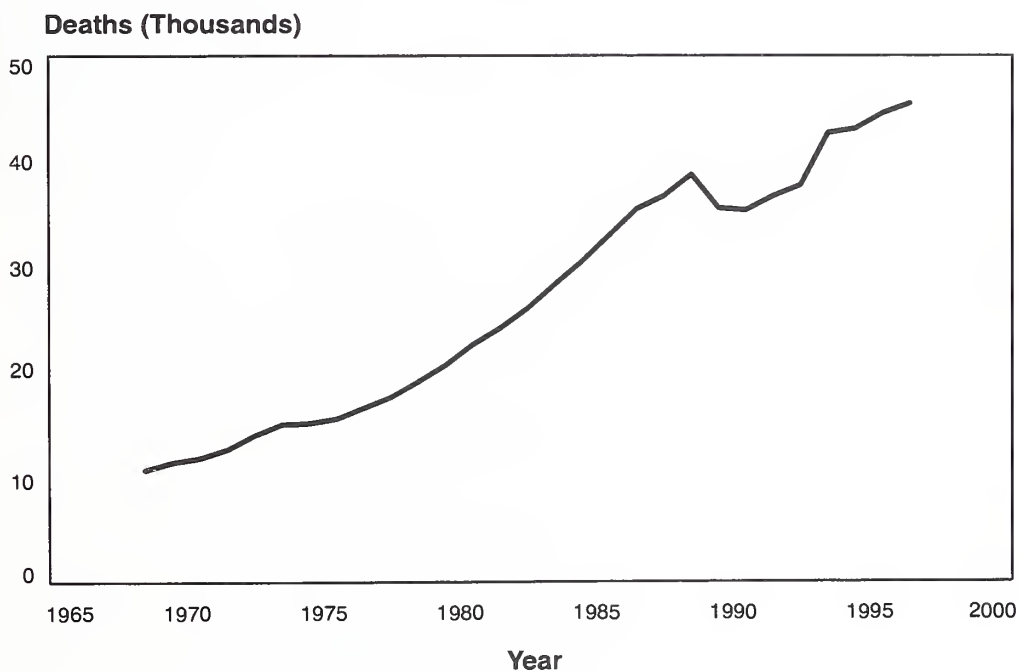
* Rate per 100,000 population age-adjusted to the 2000 standard.

† Data for 1997 are provisional or estimated by the NHLBI.

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

Source: Vital statistics of the U.S., NCHS.

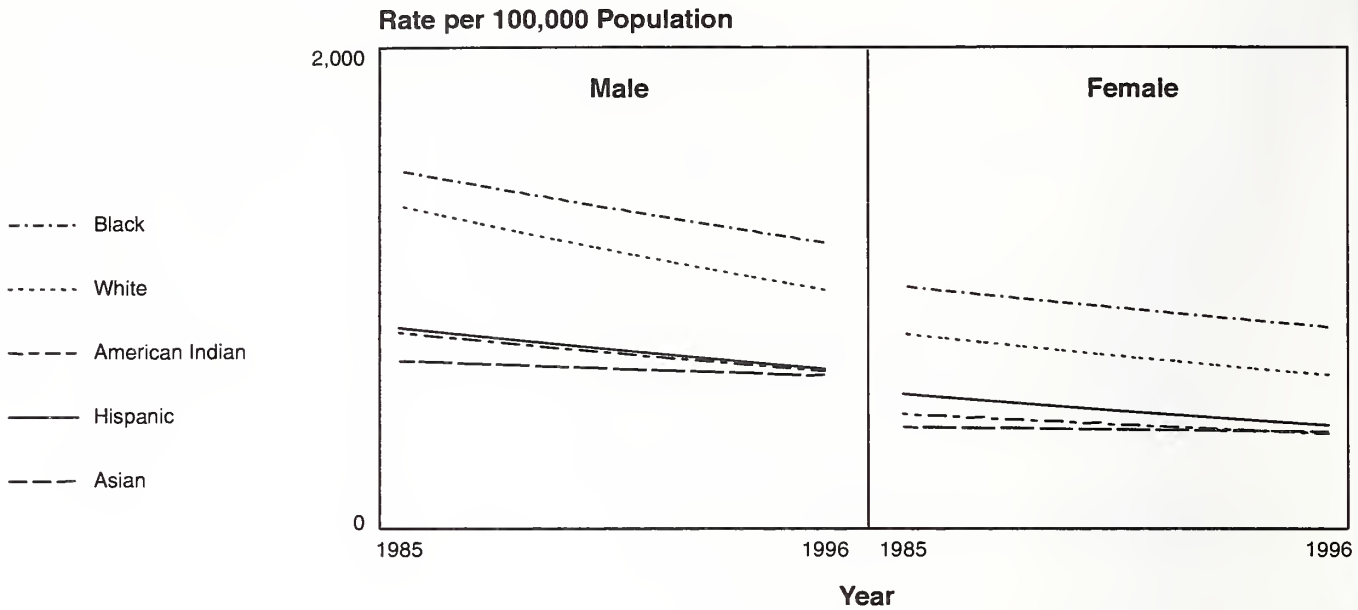
Deaths From Congestive Heart Failure, U.S., 1968-96



The sharp drop occurring in 1989 is attributed to the revision of the death certificate.

Source: Vital statistics of the U.S., NCHS.

Death Rates* for Heart Disease by Gender, Race, and Ethnicity, Ages 45+ Years, U.S., 1985-96

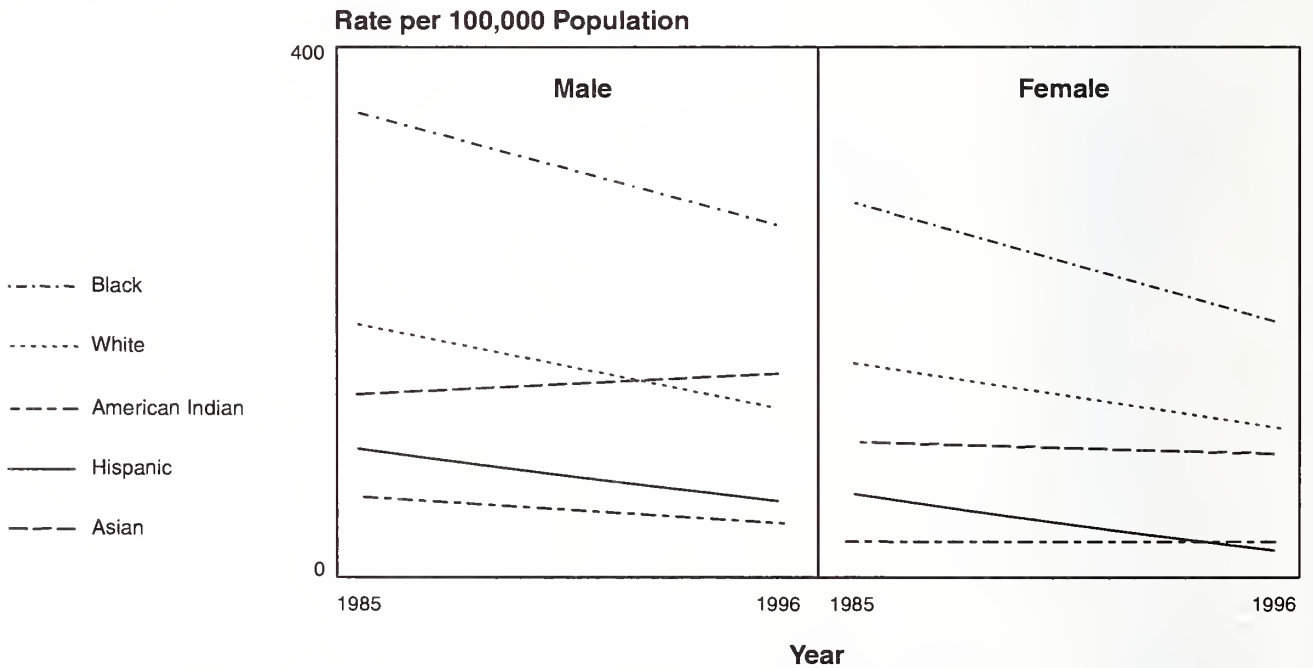


* Age-adjusted to the 2000 U.S. population.

Note: Each line is a log linear regression derived from the actual rates.

Source: Vital statistics of the U.S., NCHS.

Death Rates* for Stroke by Gender, Race, and Ethnicity, Ages 45+ Years, U.S., 1985-96



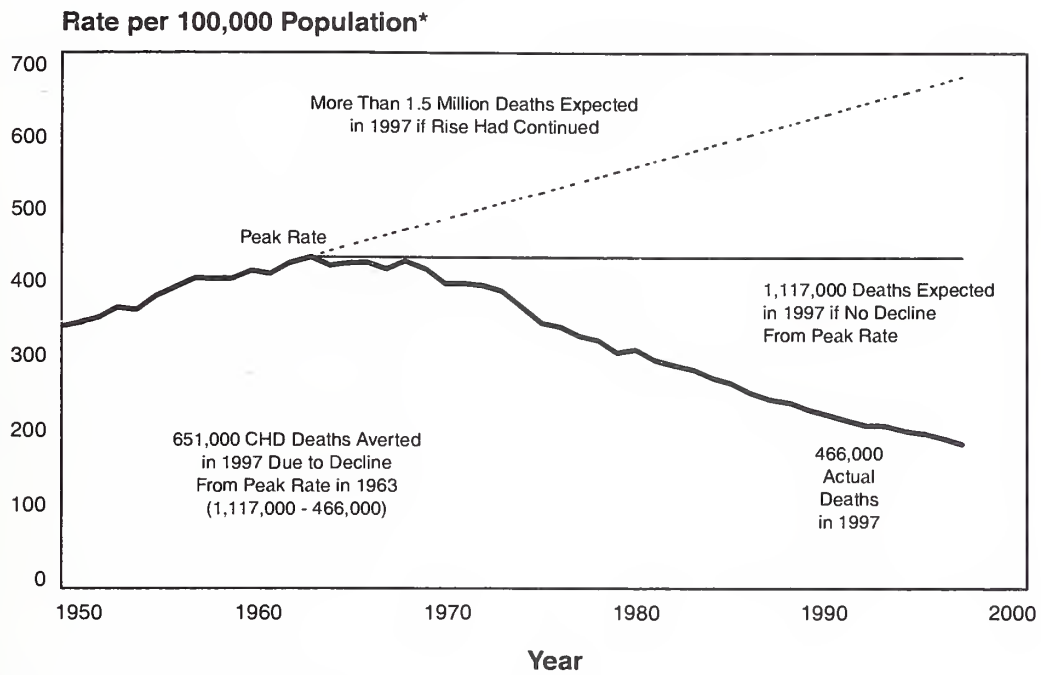
* Age-adjusted to the 2000 U.S. population.

Note: Each line is a log linear regression derived from the actual rates.

Source: Vital statistics of the U.S., NCHS.

Death Rates for Coronary Heart Disease, U.S., 1950-97

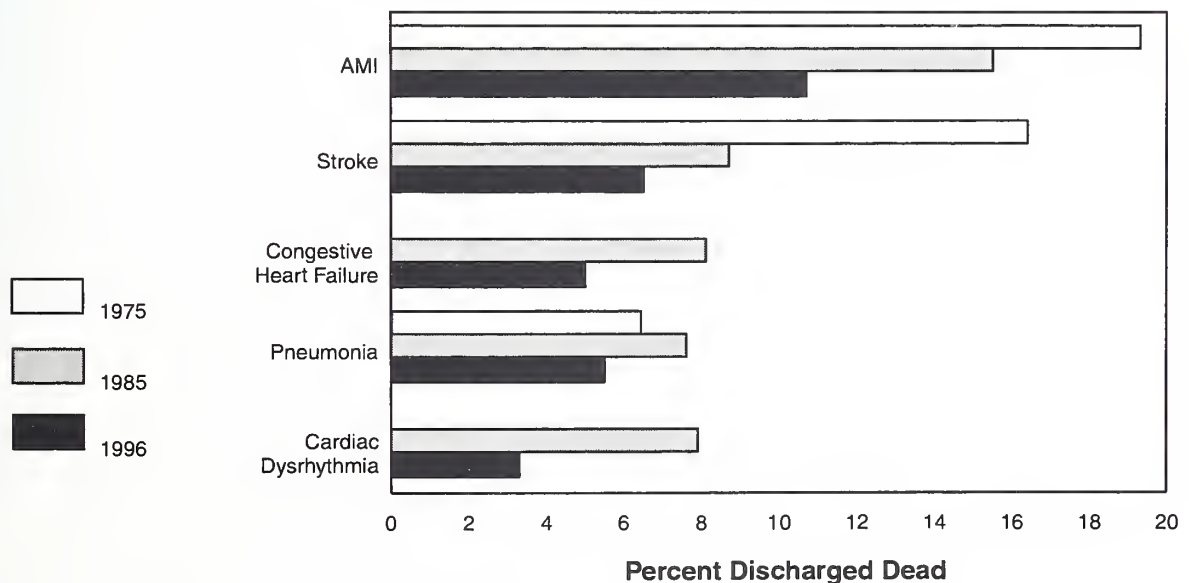
Actual Rate and Expected Rates if Rise Had Continued or Reached a Plateau



* Age adjusted to 2000 U.S. population. (Comparability ratio applied to 1968-78 rates.)

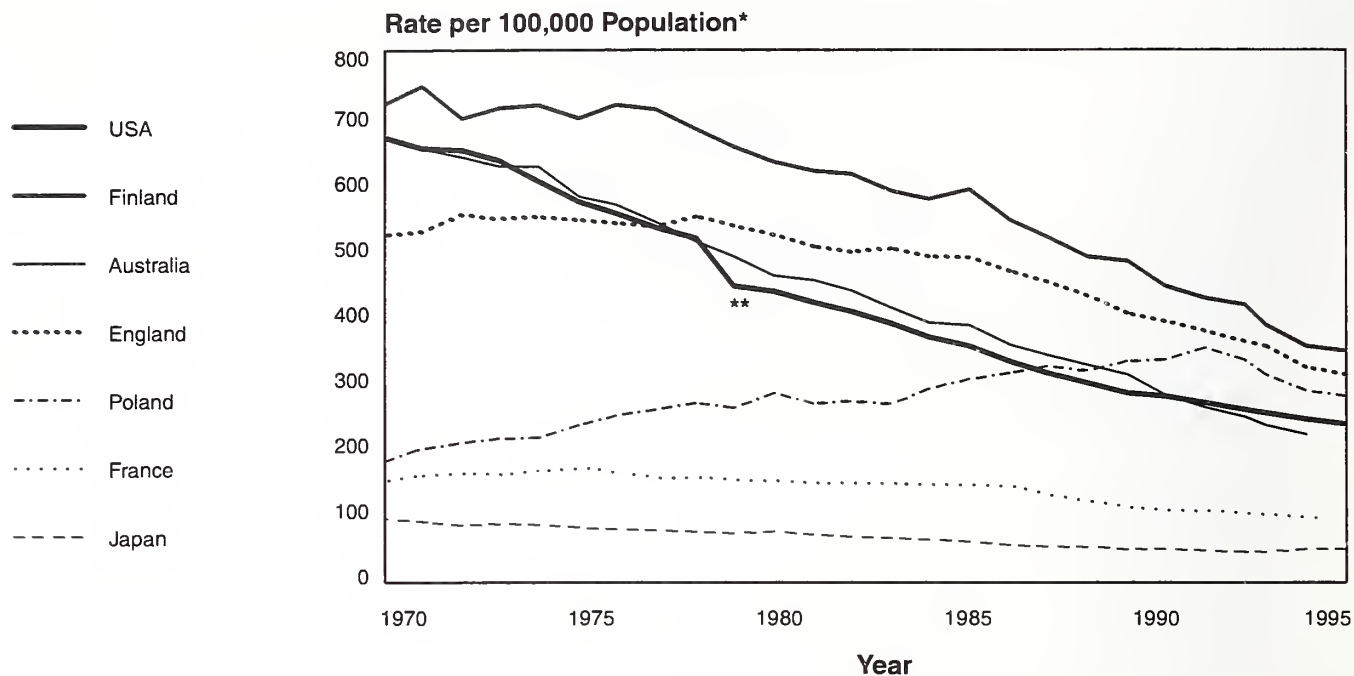
Source: Vital statistics of the U.S., NCHS. Data for 1997 are provisional.

Common Cardiovascular and Lung Diseases With High Percentage Discharged Dead From Hospitals, U.S., 1975, 1985, and 1996



Source: National Hospital Discharge Survey, NCHS.

Death Rates for Coronary Heart Disease in Men Ages 35-74 Years, Selected Countries, 1970-95

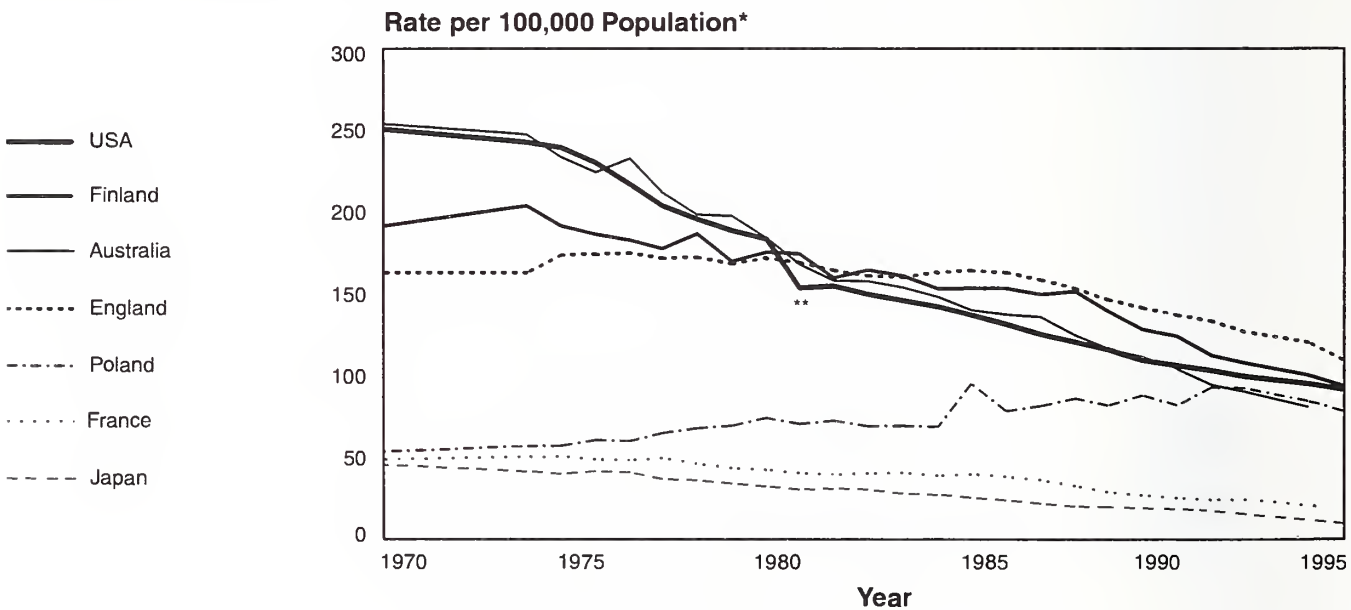


* Age-adjusted to the European Standard Population.

** The sudden decline is due to revision in the International Classification of Diseases in 1979.

Source: World Health Statistics Annual, WHO.

Death Rates for Coronary Heart Disease in Women Ages 35-74 Years, Selected Countries, 1970-95

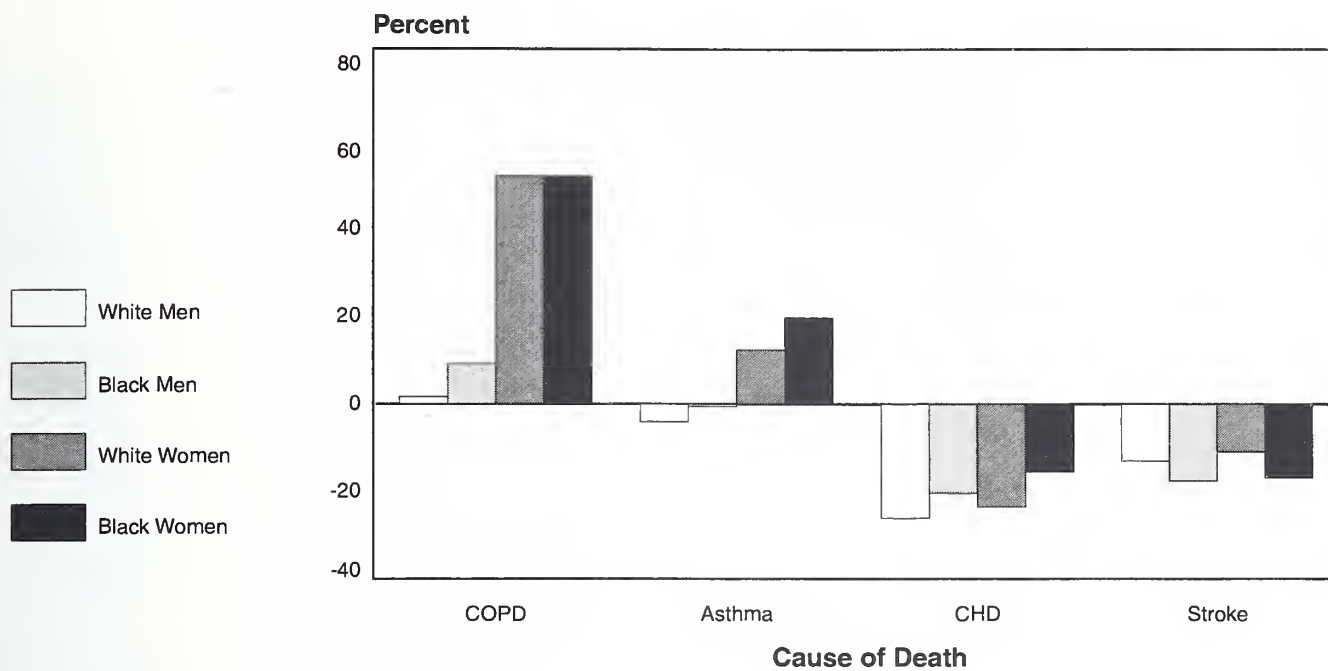


* Age-adjusted to the European Standard Population.

** The sudden decline is due to revision in the International Classification of Diseases in 1979.

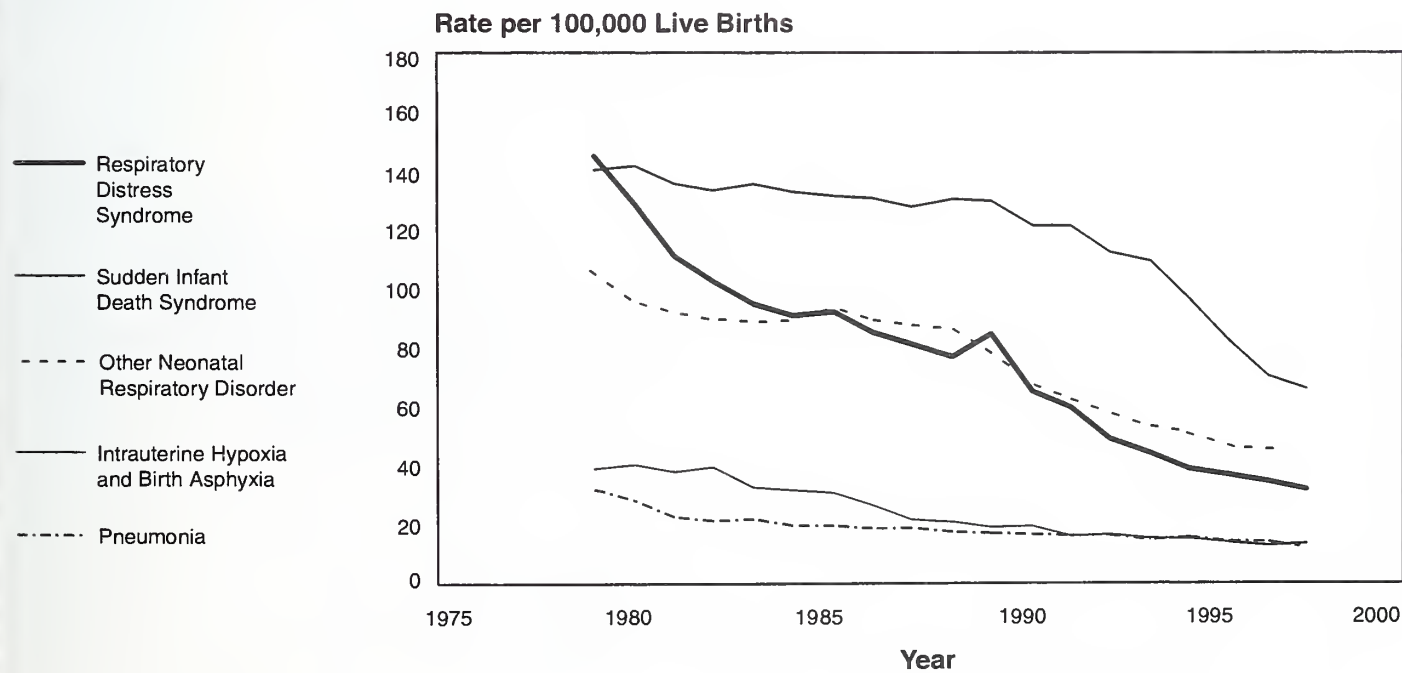
Source: World Health Statistics Annual, WHO.

Change in Death Rates* for Selected Causes by Race and Gender, U.S., 1987-97



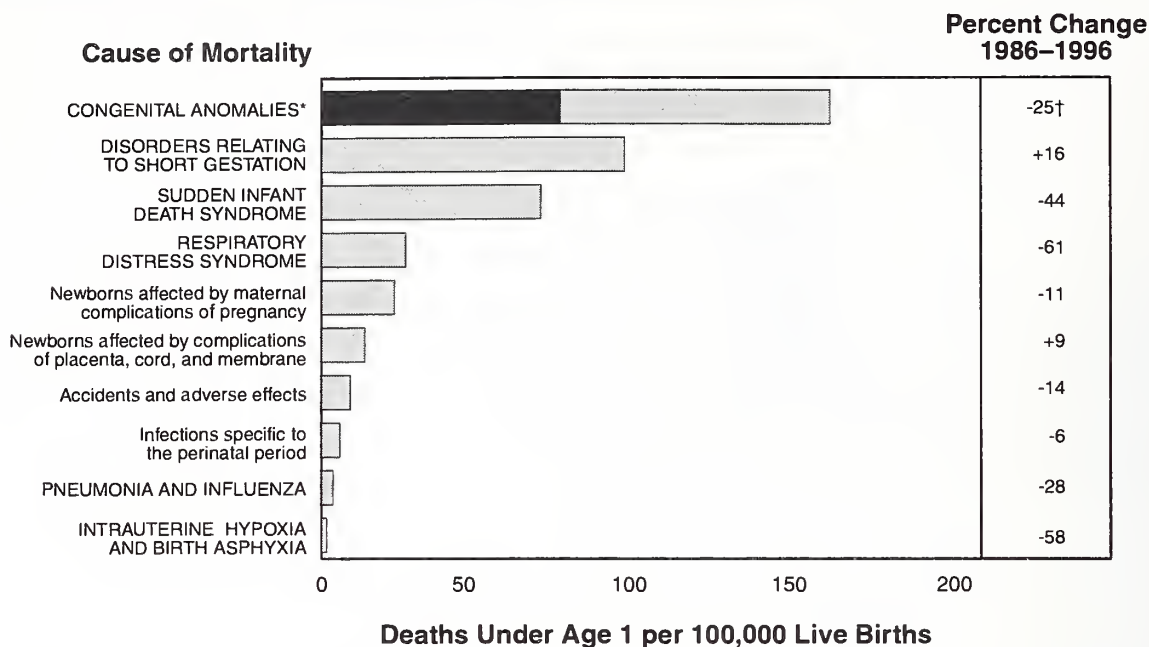
* Age-adjusted to the 2000 U.S. population.
Source: Vital statistics of the U.S., NCHS.

Death Rates for Lung Diseases in Infants, U.S., 1979-97



Source: Vital statistics of U.S., NCHS.

10 Leading Causes of Infant Mortality, U.S., 1996



* In 1996, congenital CVD and congenital anomalies of the respiratory system represented about 50 percent of all infant deaths due to congenital anomalies.

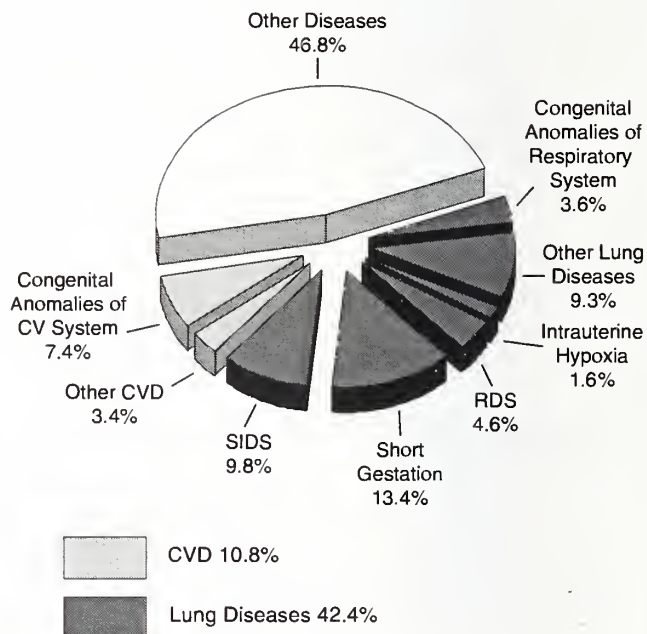
† Between 1986 and 1996, congenital CVD declined 28 percent; congenital anomalies of the respiratory system declined 17 percent; other congenital anomalies declined 25 percent.

Note: Capitalization indicates diseases addressed in Institute programs.

Source: From 1986 final and 1996 provisional vital statistics of the U.S., NCHS.

Deaths Under Age 1 Year Due to Cardiovascular and Lung Diseases, U.S., 1997

Cause of Death	Deaths Under Age 1
All Causes	27,692‡
Cardiovascular Diseases	3,003
Congenital Anomalies	2,058*
Other	945*
Lung Diseases	11,732
Sudden Infant Death Syndrome (SIDS)	2,705
Respiratory Distress Syndrome (RDS)	1,262*
Short Gestation	3,727*
Intrauterine Hypoxia	456
Congenital Anomalies	995*
Other Lung Diseases	2,587†
Other Diseases	12,957



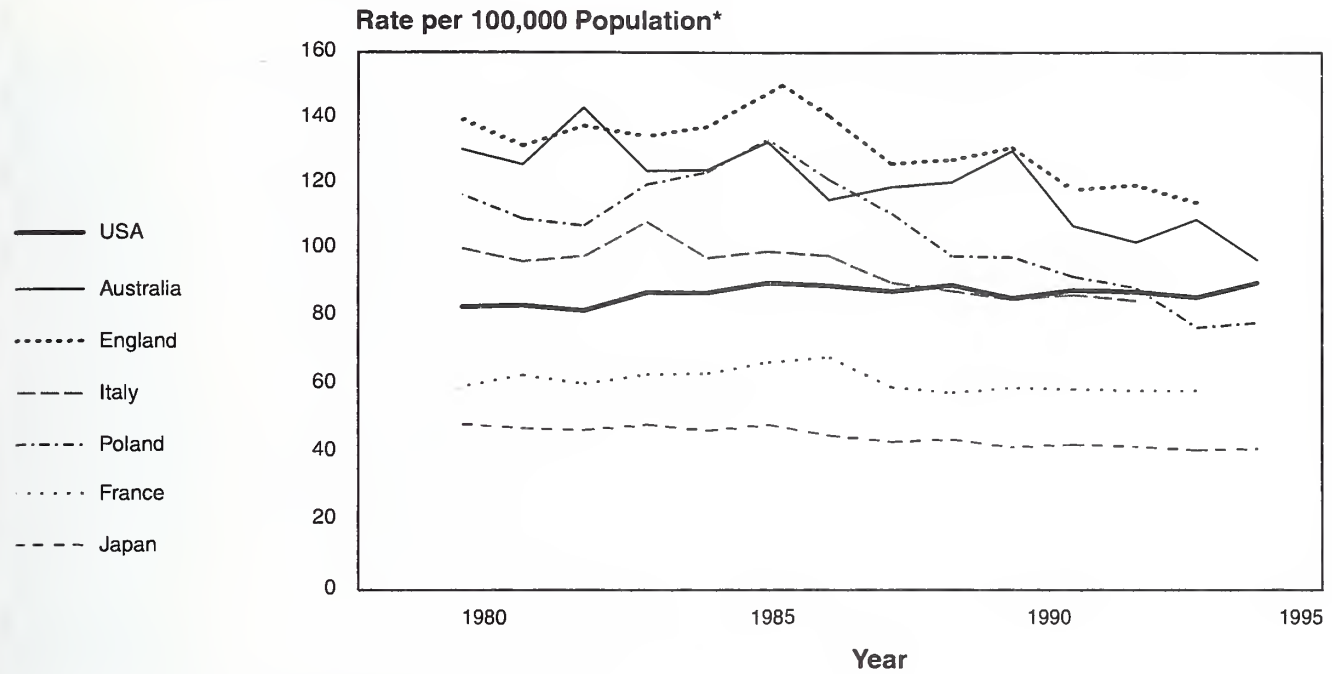
* NHLBI programs address these diseases.

† NHLBI programs address diseases that caused about one half of these deaths.

‡ Numbers may not add to total due to rounding.

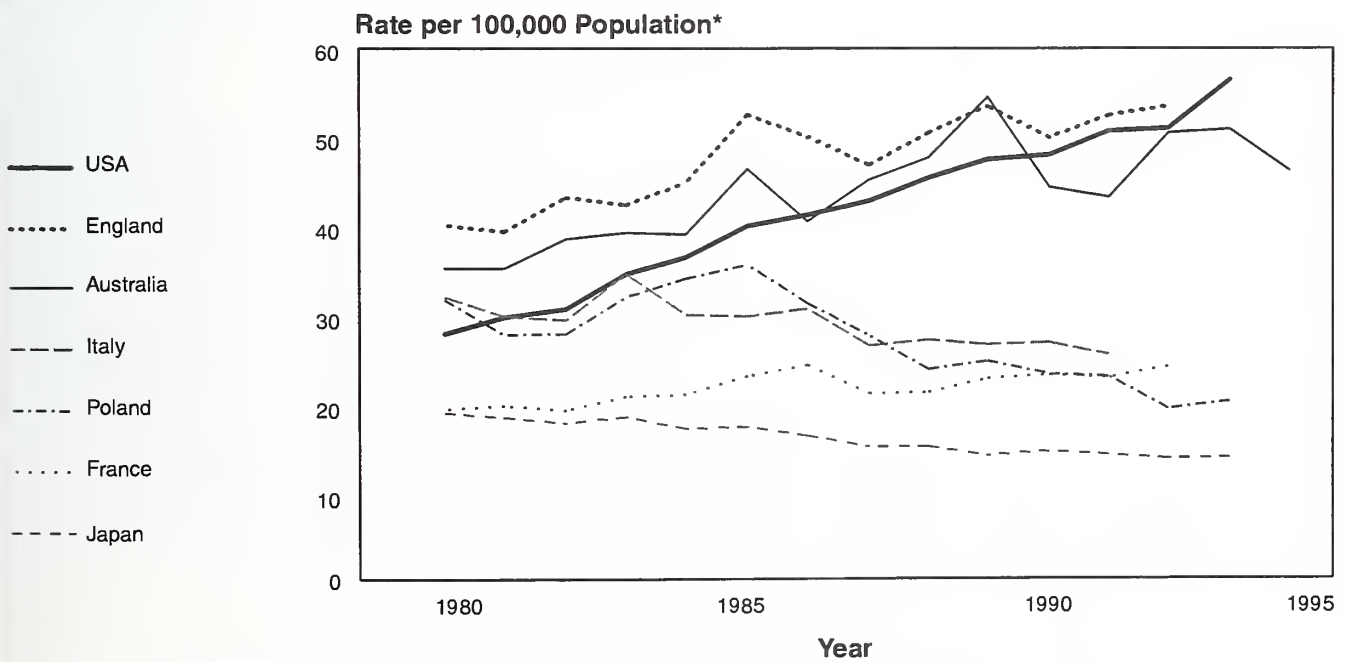
Source: Estimated by the NHLBI from final 1996 and provisional 1997 vital statistics of the U.S., NCHS.

Death Rates for Chronic Obstructive Pulmonary Disease in Men Ages 35-74 Years, Selected Countries, 1980-94



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

Death Rates for Chronic Obstructive Pulmonary Disease in Women Ages 35-74 Years, Selected Countries, 1980-94



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

Prevalence of Common Cardiovascular, Lung, and Blood Diseases, U.S., 1996

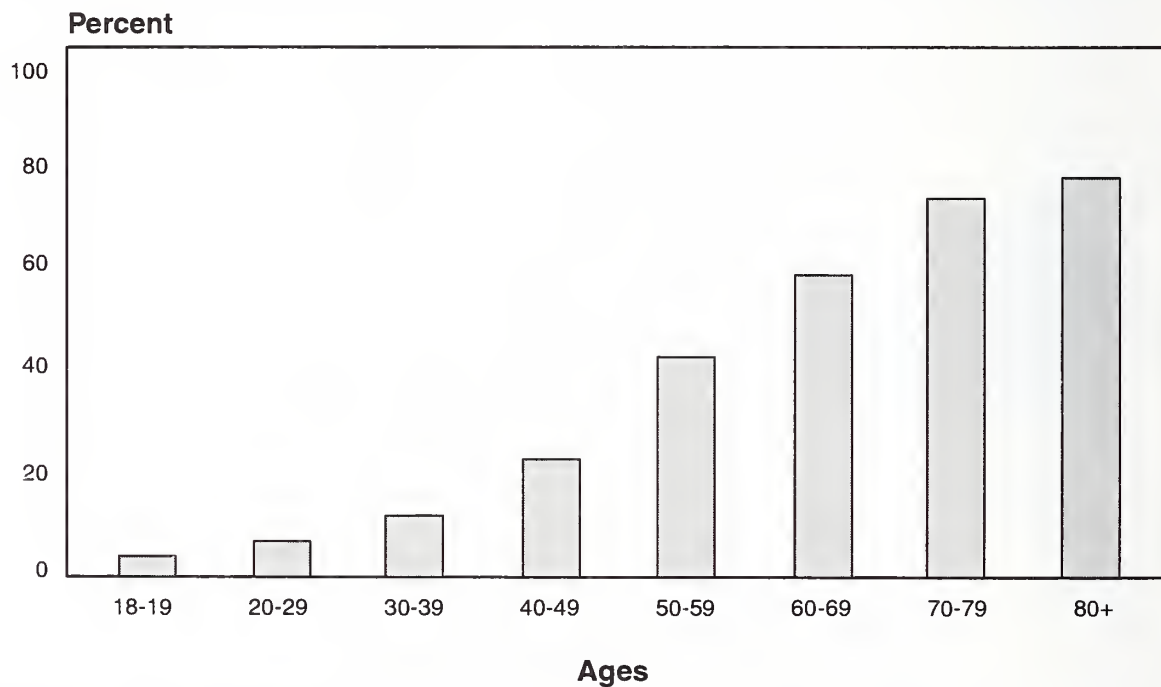
Disease	Number
Total Cardiovascular Diseases	58,800,000
Hypertension*	50,000,000
Coronary Heart Disease	12,000,000
Arrhythmias	3,900,000
Congestive Heart Failure	4,600,000
Rheumatic Heart Disease	1,800,000
Cerebrovascular Diseases	4,400,000
Hardening of Arteries	1,600,000
Congenital Heart Disease	1,000,000
Asthma	14,600,000
Chronic Bronchitis	14,200,000
Emphysema	1,800,000
Anemias (all forms)	3,500,000

* Systolic blood pressure 140 mm Hg or greater and/or diastolic 90 or greater or on antihypertensive medication.

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), 1996.

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

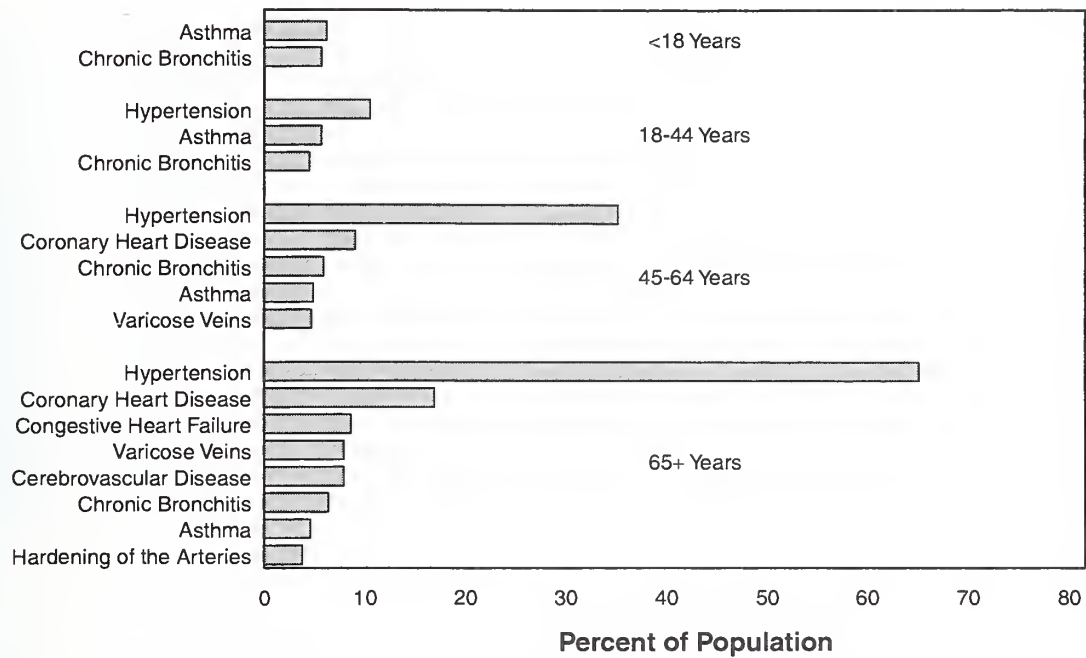


* Hypertension, coronary heart disease, cerebrovascular disease, congestive heart failure, rheumatic heart disease, or congenital cardiovascular disease.

Hypertension = 140/90+ or on medication.

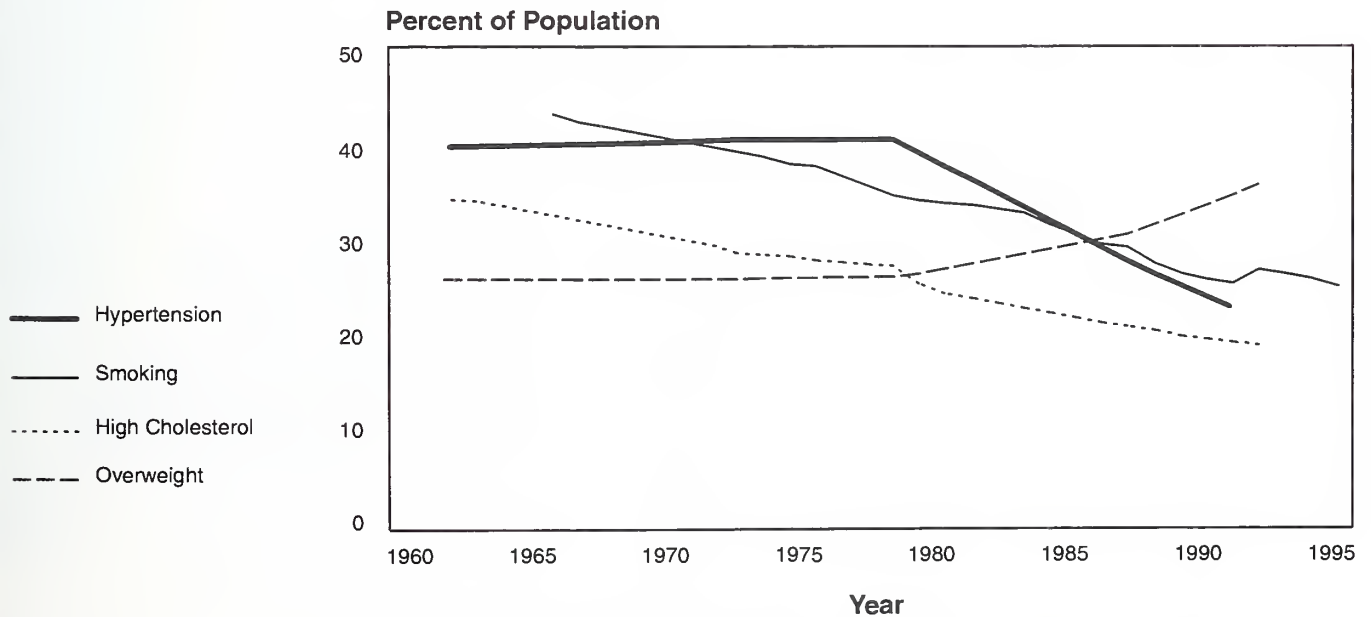
Source: NHANES, 1988-94.

Prevalence of Common Cardiovascular and Lung Diseases by Age, U.S., 1996



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

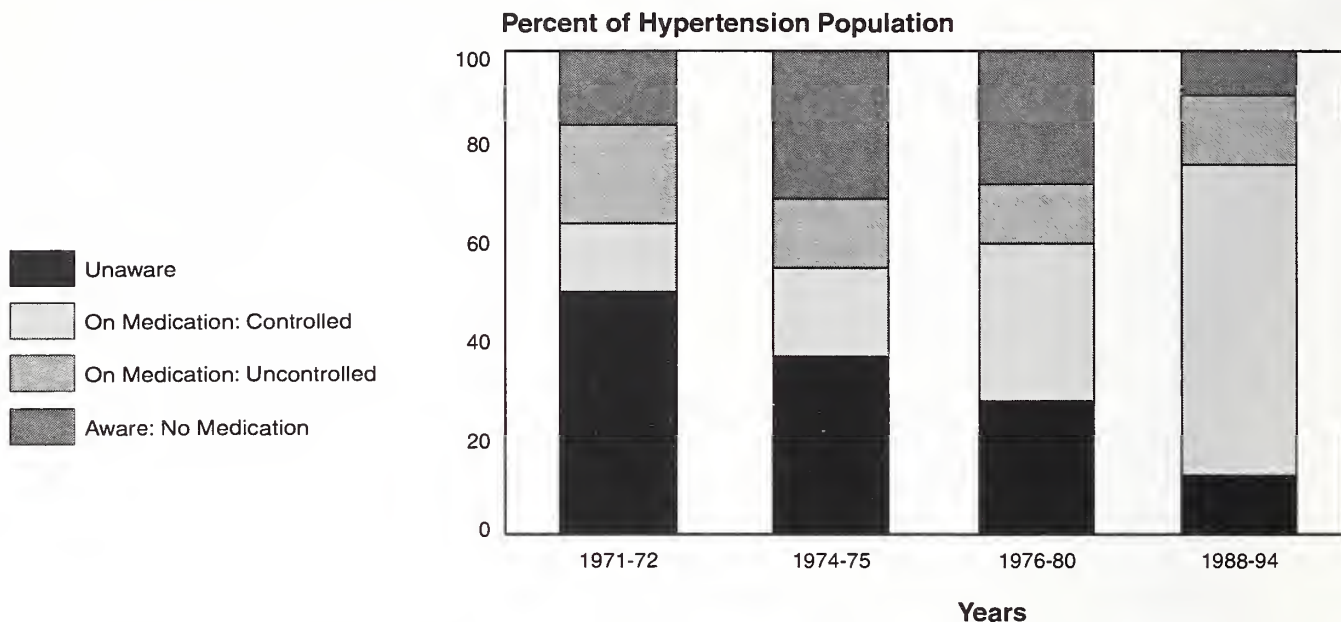
Prevalence of Cardiovascular Disease Risk Factors, U.S., 1960-95



Hypertension is blood pressure 140/90+ mm Hg or on medication. Total serum cholesterol is 240+ mg/dl. Overweight is BMI 27.8+ kg/m² for men and 27.3+ for women.

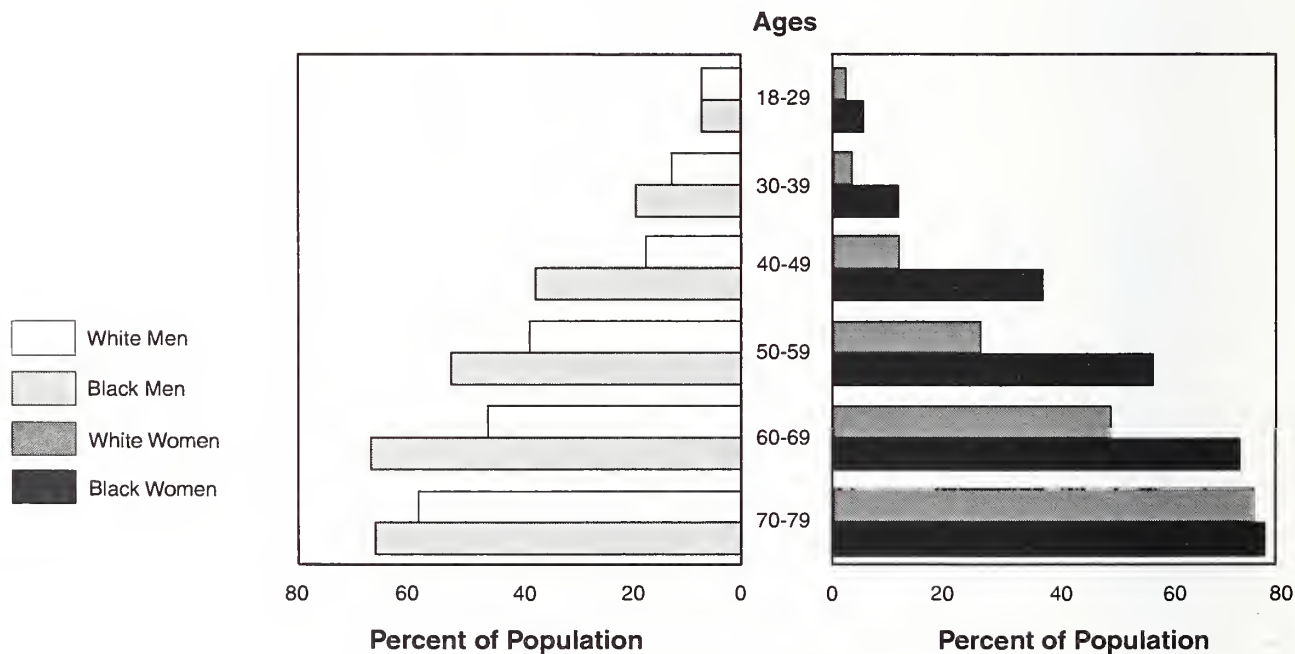
Source: NHIS for smoking and NHANES for the other risk factors.

Hypertensive Population* Aware, Treated, and Controlled, U.S., 1971-72 to 1988-94



* Systolic blood pressure 160+ mm Hg or diastolic blood pressure 95+ or taking antihypertensive medication.

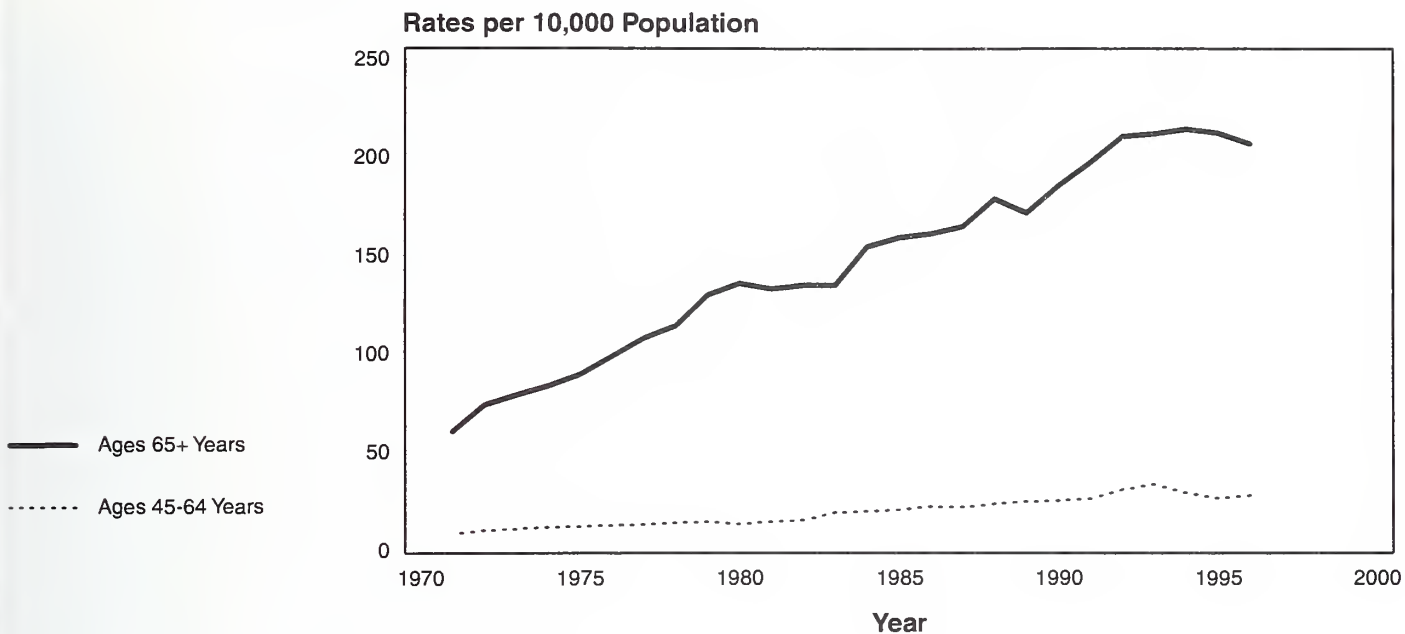
Adult Population With Hypertension* by Age, Gender, and Race, U.S., 1991-94



* Systolic blood pressure 140+ or diastolic blood pressure 90+ or taking antihypertensive medication.

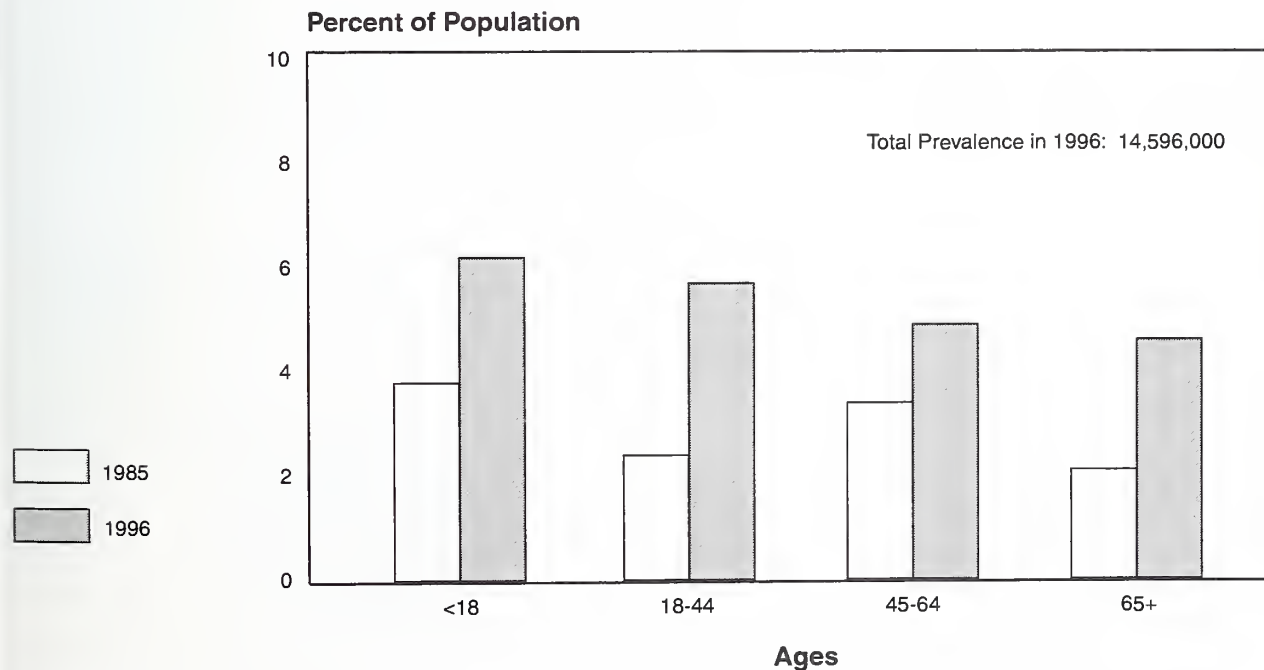
Source: NHANES, NCHS, personal communication.

Hospitalization Rates for Congestive Heart Failure, Ages 45-64 Years and 65+ Years, U.S., 1971-96



Source: National Hospital Discharge Survey, NCHS.

Prevalence of Asthma by Age, U.S., 1985 and 1996



Source: NHIS, NCHS.

Direct and Indirect Economic Costs of Illness by Major Diagnosis, U.S., 1999

	Amount (Dollars in Billions)				Percent Distribution			
	Direct Costs*	Indirect Costs			Direct Costs	Indirect Costs		
		Morbidity†	Mortality‡	Total		Morbidity	Mortality	Total
Cardiovascular Diseases§ (Including Blood Clotting)~	\$178.2 (41.9)	26.5 (6.2)	81.8 (22.9)	286.5 (71.0)	14.8 (4.3)	15.7 (3.7)	23.5 (6.6)	16.6 (4.1)
Lung Diseases**	88.1	21.9	17.2	127.2	7.3	13.0	5.0	7.4
Blood Diseases	8.5	0.6	1.6	10.7	0.7	0.4	0.5	0.6
Subtotal	274.8	49.0	100.6	424.4	22.8	29.1	29.0	24.6
Diseases of the Digestive System	125.7	8.6	14.1	148.4	10.4	5.1	4.1	8.6
Neoplasms	57.7	14.4	77.0	149.1	4.8	8.6	22.2	8.7
Mental Disorders	94.5	22.2	4.5	121.2	7.8	13.2	1.3	7.0
Diseases of the Nervous System	65.7	6.5	5.8	78.0	5.4	3.9	1.7	4.5
Diseases of the Musculoskeletal System	63.2	17.1	1.2	81.5	5.2	10.2	0.3	4.7
Diseases of the Genitourinary System	50.2	4.3	3.2	57.7	4.2	2.6	0.9	3.3
Endocrine, Nutritional, and Metabolic Diseases	44.5	5.5	9.7	59.7	3.7	3.3	2.8	3.4
Infectious and Parasitic Diseases	32.5	10.3	33.2	76.0	2.7	6.1	9.6	4.5
Diseases of the Skin	49.3	1.3	0.2	50.8	4.1	0.8	0.1	2.9
Other Respiratory Diseases	51.1	6.7	2.3	60.1	4.2	4.0	0.7	3.5
Other and Unallocable	296.9	22.5	95.6	415.0	24.6	13.4	27.5	24.1
Total	\$1,206.1	\$168.4	\$347.4	\$1,721.9	100%	100%	100%	100%

* Direct costs of CVD are extrapolated to 1999 from costs estimated by NCHS. Direct costs are personal health care expenditures for hospital and nursing home care, drugs, home care, and physician and other professional services. Totals for these types of costs are estimated by HCFA. Allocation by diagnosis is based on statistics from the National Hospital Discharge Survey, the National Ambulatory Medical Care Survey, the National Home and Hospice Survey, and the National Nursing Home Survey of the NCHS.

† Morbidity costs were estimated for 1999 by multiplying 1998 NCHS estimates by a 5 percent inflation factor.

‡ Mortality estimates are obtained by multiplying 1998 NCHS estimates by a 5 percent inflation factor.

§ Includes congenital CVD.

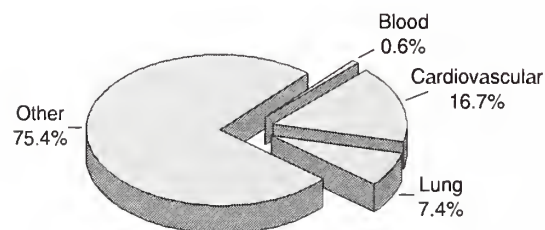
~ Based on NHLBI definition of blood-clotting diseases based primarily on proportions of morbidity and mortality statistics for acute MI, cerebrovascular diseases, and diseases of arteries.

++ Does not include lung cancer, leukemias, or pulmonary heart disease.

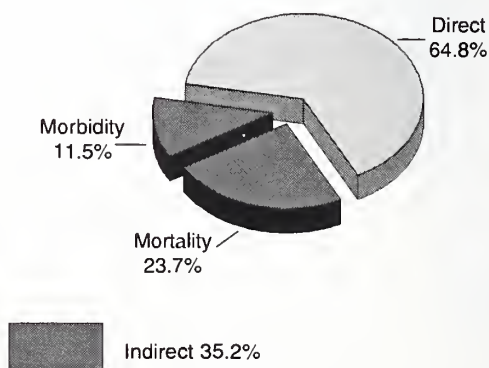
Note: Numbers may not add to totals due to rounding.

Source: Estimates by NHLBI; data from NCHS, HCFA, and the Bureau of the Census.

Total Economic Costs, U.S., 1999



Economic Costs: Cardiovascular, Lung, and Blood Diseases, U.S., 1999





5. Institute-Initiated Programs Starting in FY 1998

Approximately three-quarters of the research supported by the NHLBI is initiated by individual investigators; the remainder is initiated by the Institute. This chapter describes the rationale for Institute-initiated programs and the objectives of the Institute-initiated programs that began in FY 1998.

It is incumbent upon the Institute to respond appropriately to evolving national needs, Congressional mandates, and advances in scientific knowledge. Each NHLBI initiative represents the outcome of numerous and extensive discussions and thorough reviews by representatives of the scientific community and by Institute advisory committees and special emphasis panels. The advisory committees and special emphasis panels, 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 show the best opportunities or have 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 evolve as Requests for Applications (RFAs) for grants or for 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 that are acceptable to the NHLBI Director are presented to the National Heart, Lung, and Blood Advisory Council (NHLBAC) for review, comments, 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 the

proposed mechanism. These considerations guide the Director's subsequent decision to approve an initiative for release. Released initiatives 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 (formerly, the NIH Division of Research Grants).

Descriptions of the 39 Institute-initiated programs beginning in FY 1998 are presented below according to the NHLBI scientific program.

HEART AND VASCULAR DISEASES PROGRAM

New Initiatives

Characterization and Standardization of Lipoprotein(a) [Lp(a)] Assays

Recent studies have shown that the cholesterol-rich Lp(a) is a strong and independent predictor for coronary and cerebrovascular disease. Although numerous commercially available immunoassays for measuring Lp(a) in human plasma have been developed, no adequate assay standardization or generally accepted reference material and method exist. The purpose of this RFP is to develop and validate a standardized reference method to measure plasma concentrations of Lp(a).

Endothelial Dysfunction in HIV Infection

In patients with HIV, organ damage is caused by the ability of HIV-infected cells and soluble factors in circulating blood to cross the endothelial barrier that normally protects tissues. Understanding how infected cells and soluble factors can change gene expression in endothelial cells could lead to new therapeutic options for treatment of HIV-induced organ damage. The purpose of this initiative is to determine how HIV infection alters the expression of endothelial cell genes and thereby causes the normal structure

and function of the endothelium to be modified so that organs are exposed to HIV-infected cells and to circulatory factors that could cause damage.

Heart Failure Research: New Approaches to Pathogenesis

Heart failure is a disorder that can be either primary in nature or secondary to various diseases, including hypertension, ischemic heart disease, valvular heart diseases, diabetes, and atherosclerosis. Improvements in understanding this complex disorder will require an interdisciplinary approach so that more complete models of the progression of heart failure can be constructed to serve as a basis for future therapies. The purpose of this RFA is to stimulate innovative multidisciplinary investigations into cellular and molecular underpinnings of heart failure and to facilitate rapid application of new findings to future therapies.

Jackson Heart Study

Cardiovascular and total mortality are known to be higher in black Americans than in white Americans, but reasons for the differences are yet to be defined. The purpose of this initiative is to establish a single-site epidemiologic study of CVD in blacks similar to those previously established in Framingham, MA, and Honolulu, HI. Its goals are to identify risk factors for development and progression of CVD in blacks, with emphasis on manifestations related to hypertension (left ventricular hypertrophy, CHF, CHD, stroke, and renovascular disease); to enhance recruitment, cohort retention, and scientific productivity of the existing Jackson component of the Atherosclerosis Risk in Community Study; and to build research capabilities at minority institutions, partnerships between minority and majority institutions, and expanded minority investigator participation in large-scale epidemiological studies.

Magnesium in Coronaries (MAGIC)

Supplemental administration of magnesium very early after the onset of acute MI is supported by data indicating its potential cardioprotective effects. For example, in experimental models of ischemia and reperfusion, agents such as magnesium that inhibit calcium influx improved post-ischemic recovery of mechanical function when given before or at the time of reperfusion.

Reduced serum magnesium, on the other hand, appears to be responsible for a maladaptive increase in coronary tone and for an increased response to vasoconstrictors. Thus, during an MI, when increased serum magnesium might be beneficial, there is actually a decline in free magnesium. The purpose of this initiative is to determine whether early treatment of patients with suspected acute MI with intravenous magnesium reduces mortality.

Molecular and Physical Characterization of the Vulnerable Plaque

Convincing new clinical data demonstrate that nonocclusive lesions often produce acute coronary syndromes. It is increasingly evident that although the lesions of atherosclerosis may become sufficiently advanced to produce severe obstruction of the coronary arteries, it is often the less prominent plaque that is particularly prone to disruption, erosion, and thrombosis. The goal of this RFA is to study the properties of vulnerable atherosclerotic plaque, especially in relation to its tendency to progress to erosion and rupture, leading to thromboembolic events, unstable angina, MI, and sudden death. Special emphasis will be placed on multidisciplinary, collaborative studies of pathoanatomical and biochemical approaches to identify major determinants of vulnerability to erosion and rupture; humoral and systemic factors involved in thrombosis; physical forces associated with plaque disruption; and methods to identify and quantify physicochemical features of plaques in vivo.

Nutrition Academic Award

Diet has been associated with 8 of the 10 leading causes of death in the United States. A number of national committees, panels, and agencies have made recommendations for individuals to modify and improve dietary intake as a major step toward preventing premature morbidity and mortality from cardiovascular and other chronic diseases. More recognition is being given to the importance of nutrition training for health care providers, since they play a key role in communicating this information to patients and the general public. This RFA was established to develop or enhance medical school curricula by increasing opportunities for students, house staff, faculty, and practicing physicians to learn the principles and clinical practice skills of nutrition

with an emphasis on preventing CVD. It is expected that training modules will be available for dissemination to other medical schools and clinical settings.

Subclinical Cardiovascular Disease Study

Prospective epidemiologic studies have traditionally relied on the occurrence of clinically overt events such as MI, stroke, and CHD death to identify factors predicting disease. This design has been successful in identifying a number of CVD risk factors in the general population, but risk factors defined by these methods fail to predict up to one-half of future CVD events. The purpose of this prospective 10-year observational study of subclinical CVD (disease detected noninvasively before it has produced signs and symptoms) is to determine characteristics related to progression of subclinical to clinical CVD, identify factors related to newer measures of subclinical disease, examine relationships between new and established measures, and develop population-based methods suitable for application in future screening and intervention studies to identify asymptomatic persons at highest risk of clinical events.

LUNG DISEASES PROGRAM

New Initiatives

Development of Educational Materials on Smoking Cessation and Asthma Management

The NHLBI has developed educational materials that can be used by patients, their families, and health care professionals on smoking cessation and asthma management. However, because they were targeted to specific situations and may not be extrapolatable to a broader audience, the objective of this PA is to apply translation and dissemination research methodology to existing materials to convert them into products for wide dissemination and use by other targeted groups.

Origins of Asthma in Early Life

The prevalence of asthma has increased over the past two decades in the United States. Family clustering of the disorder suggests a genetic basis, but since the genetic background of the American population has not changed significantly over this period, it is most likely that the rising trend relates to environmental factors interacting with

susceptibility genes. The purpose of this RFA is to elucidate maternal, fetal, and early childhood risk factors for onset of asthma. It is especially intended to identify interrelationships between maternal factors and early life events that may influence development of the lung and immune system and the expression of inflammatory and structural changes in the airways that are characteristic of asthma.

Pulmonary Immune Defenses and Their Regulation: Understanding Dysfunction Associated with HIV Disease

Patients with AIDS die predominantly from respiratory infections. Little is known about lung immunity in patients with AIDS or the role of pulmonary lymphoid tissue in HIV infection. The objective of this RFA is to understand the molecular and cellular regulation of local immunity in the lungs, specifically as it relates to HIV infection and HIV-associated opportunistic infections.

Role of Respiratory Infections in the Development of Childhood Asthma

A major issue in childhood asthma is the role of infections in its development and persistence. Clinical and epidemiological studies suggest that viral respiratory infections and exposure to allergens, together with a genetic background of the host, are the most important risk factors early in life that may lead to wheezing, prolonged alterations in airway function, and development of persistent asthma. Other individuals may be genetically predisposed to mount strong protective immune responses on exposure to certain infectious agents and may be genetically predisposed to have a reduced capacity to develop allergic responses. The purpose of this RFA is to stimulate research on cellular and molecular mechanisms by which respiratory pathogens contribute to development of, exacerbation of, or protection from childhood asthma.

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

Recent advances in cellular and molecular neurobiology of sleep offer new opportunities to study basic mechanisms of sleep and the consequences of disturbed sleep. The objective of the Sleep 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.

Despite dramatic advances in CF research, much remains to be determined about the biology, structure, and function of the cystic fibrosis transmembrane regulator (CFTR), the protein responsible for allowing movement of chloride ions through cell membranes. The objectives of the CF SCOR are to investigate the pathogenesis of CF and the role of CFTR in airway biology and to develop new treatment strategies.

Many questions remain about the progression and natural history of acute lung injury (ALI) and acute respiratory distress syndrome (ARDS). The objective of the ALI SCOR is to promote understanding of the pathogenesis of ALI/ ARDS and to develop treatment strategies for the disorder.

BLOOD DISEASES AND RESOURCES PROGRAM

Initiatives Being Renewed

Comprehensive Sickle Cell Centers

In the last few years significant progress has been made in improving treatment options and quality of life for patients with SCD. However, no therapy has been successful for all patients with the disorder. The purpose of this RFA is to support basic, clinical, and behavioral research and research training that will lead to new approaches in diagnosis, prevention, and treatment of SCD.

New Initiatives

Clinical Research on Cooley's Anemia

Cooley's anemia is a genetic blood disease that results in inadequate production of hemoglobin, the essential oxygen-carrying substance in blood. New treatment modalities are needed because those currently available are inadequate. This RFA will support clinically related research focused on improving clinical management of Cooley's anemia. Areas of particular importance include studies on better methods for noninvasive measurement of tissue iron burden, alternative approaches to iron chelation therapy, and pharmacological enhancement of fetal hemoglobin.

Immunogenetics of Inhibitor Formation in Hemophilia

Hemophilia A and B are hereditary bleeding disorders characterized by complete or partial deficiency of factor VIII and factor IX, respectively. Alloantibodies, factor VIII or factor IX inhibitors, which specifically neutralize the activity of the replacement factor and complicate treatment, can result from exposure to plasma derived factor concentrates or recombinant factors used to treat bleeding episodes. The objectives of this RFA are to improve understanding of inhibitor formation and immune tolerance induction in hemophilia patients and to develop new treatment strategies.

New Approaches To Improve the Viability and Function of Transfused Platelets

Platelets demonstrate a progressive loss in viability during storage. Part of the loss may represent activation during collection, processing, and storage resulting in premature removal of platelets from circulation. The goals of this RFA are to elucidate the nature of alterations produced in blood platelets during collection and storage, to develop techniques for monitoring viability and function of platelets after collection and during storage, and to develop methods to prevent defects responsible for loss of function. The ultimate objective is to define the conditions that will provide better hemostatic function as a result of platelet transfusions to thrombocytopenic patients.

Thrombocytopenia: Pathogenesis and Treatment

Idiopathic (autoimmune) thrombocytopenic purpura is a common disorder of immune regulation. It affects children and adults of all ages and is common in patients infected with HIV. The purpose of this RFA is to improve understanding of the pathogenesis of thrombocytopenia in general and HIV-related thrombocytopenia in particular. The long-term goal of the initiative is to develop better therapeutic approaches for the disorder.

Thrombopoietin, Megakaryocytopoiesis, and Platelet Production

Platelets play an essential role in hemostasis and thrombosis. If circulating platelets drop below a certain level (thrombocytopenia), catastrophic hemorrhage can occur. Thrombopoietin

(TPO), a humoral factor present in plasma of patients with severe thrombocytopenia, has been found to increase platelet count when injected into animals. In 1994, TPO was cloned, and recombinant TPO was shown to increase platelet levels *in vivo*; however, safety, specificity, and its mechanism of action are yet to be defined. The objective of this initiative is to understand the basic molecular actions of TPO, the body's primary regulator of blood platelet production, in (1) proliferation and development of bone marrow megakaryocytes (source of platelets), (2) platelet production, and (3) regulation of platelet levels. In addition, this initiative seeks to increase our understanding of the production and regulation of TPO.

TRANS-NHLBI

Initiatives Being Renewed

Mentored Research Scientist Development Award for Minority Faculty

The NHLBI has developed a number of programs that support minority individuals pursuing careers in research. The purpose of this RFA is to encourage enhancement of research skills in cardiovascular, pulmonary, and hematologic diseases, sleep disorders, and transfusion medicine by minority faculty members at domestic institutions and to increase the number of minority individuals involved in research in those areas.

Minority Institutional Faculty Mentored Research Scientist Development Award

The purpose of this RFA is to enhance research skills of faculty members with doctoral degrees in biomedical or behavioral science at minority institutions in areas relevant to the NHLBI. The applicant faculty member is expected to establish a mentoring relationship with an accomplished investigator at a nearby institution and to develop a program of intensive, full-time training during the summer periods and part-time (minimum 25 percent) training during the academic year for up to 5 years.

Minority Institutional Research Training Program

The objective of this RFA is to offer research training grants to minority schools and institu-

tions to encourage enhancement of research skills by future investigators in cardiovascular, pulmonary, and hematologic research and sleep disorders. The grants are intended to attract students to research careers in these areas by increasing their awareness of these disorders and acquainting them with related research career opportunities.

Short-Term Research Training for Minority Students Program

This RFA is designed to encourage institutions to provide opportunities for underrepresented minority students at undergraduate and graduate levels to become exposed to biomedical research in cardiovascular, pulmonary, and hematologic diseases and sleep disorders, through a short-term research experience of 2 to 3 consecutive months.

Small Business Innovation Research (SBIR) Program

This program will provide support to small business concerns for research and development (R&D) of new or improved technologies and methodologies in biomedical and behavioral research that have the potential to succeed as commercial products. In FY 1998, the NHLBI is especially seeking proposals on computer algorithms for identifying unknown proteins after peptide sequencing and atherosclerosis gene discovery.

New Initiatives

Molecular Biological Approaches to Cerebrovascular Disease Research

Major advances in cerebrovascular disease research have focused on physiological, biochemical, and biophysical mechanisms involved in regulating cerebrovascular tone. Virtually nothing is known about these mechanisms at the molecular level. The goal of this initiative is to encourage use of molecular biological approaches in investigations of the cerebrovascular system to advance understanding of vascular beds and pathophysiological processes involved in cerebrovascular circulation. Research findings could lead to the development of new therapeutic strategies and interventions for reducing stroke occurrence and severity.

Vascular and Hematopoietic Development and Disease

Both endothelial and hematopoietic cells are derived from a restricted precursor or stem cell population. Although evidence exists that endothelial and blood cells are derived from a common precursor cell, mechanisms by which they subsequently diversify are yet to be discovered. Knowledge to date suggests that at least some of the mechanisms are important for maintenance of healthy blood and vascular systems and for repair of damage in the mature organism. This initiative is focused on defining critical processes that direct differentiation and organization of the vascular system with specific emphasis on factors that specify diverse phenotypes of endothelial, blood, and vascular smooth muscle cells. It encourages innovative approaches to identify and characterize precursor cells, studies to elucidate regulatory mechanisms that determine and maintain diverse phenotypes, and strategies to define how these developmental mechanisms might be involved in the pathological condition of the mature animal. The ultimate goal is to provide a foundation for new therapies to treat cardiovascular, lung, and blood diseases.

TRANS-NIH

Initiatives Being Renewed

International Cooperative Biodiversity Groups

The discovery and development of pharmaceutical and other useful agents from natural products can, under appropriate circumstances, promote sustained economic growth in developing countries while conserving the biological resources from which they are derived. The purpose of this Interagency Agreement, between seven NIH components, the National Science Foundation, and the Foreign Agricultural Service, is to continue support for the International Cooperative Biodiversity Groups involved in interdependent issues of biodiversity conservation, economic growth, and human health through discovery of therapeutic agents for diseases. Particularly relevant areas include cancer, HIV-AIDS and associated opportunistic infections (e.g., tuberculosis), malaria, central nervous system disorders, contraception and sexually transmitted diseases, and cardiovascular and

pulmonary diseases. The agreement encourages applications that propose pharmaceutical drug discovery, research and training related to phyto-medicine analysis, and natural product-based crop protection or veterinary agents.

New Initiatives

Acupuncture Clinical Trial Pilot Grants

Acupuncture has been used in the treatment of many conditions associated with pain. Several possible diseases or conditions that may be amenable to the procedure are vaso-occlusive crises in SCD, angina pectoris, cardiac arrhythmias, asthma, hypertension, vascular disease, and stroke. The purpose of this pilot study is to establish methodological feasibility and strengthen scientific rationale for proceeding to full-scale clinical trials on use of acupuncture to prevent, manage, or treat diseases and accompanying symptoms.

Centers for AIDS Research (CFARs)

The mission of the CFARs is to support a multidisciplinary environment that promotes basic, clinical, behavioral, and translational research in prevention, detection, and treatment of HIV infection and AIDS. The objective of this PA is to provide an infrastructure that promotes activities to enhance collaboration and coordination of AIDS research and serve the requirements of all AIDS investigators at applicant institutions.

Gene Therapy in Aging

Genetic and cellular engineering techniques offer potential for new approaches to slow aging processes and treat age-related disorders. The goal of this PA is to encourage research on strategies to prevent or delay adverse aging-related changes and diseases, using genetic and cellular engineering approaches. Gene-based intervention techniques could also be used to develop better animal models of human aging changes, introduce markers to track cells transplanted to modify aging changes, and screen potential nongenetic interventions against aging processes in genetically engineered cells in vitro.

Genomic Resources for the Zebrafish

Application of experimental approaches to the formation of vertebrate embryo will contribute to the understanding of human development. The zebrafish has a number of valuable features that make it a model organism for such studies. The

goal of this RFA is to create resources that will facilitate mapping and positional cloning of genes in the zebrafish. The specific objectives of this initiative are generation of an improved resolution genetic map, development of expressed sequence tags (EST) from existing libraries and from new cDNA libraries generated from specific developmental time points and tissues under this RFA, and creation of a physical (radiation hybrid) map of the zebrafish genome. Mutational studies in this species have the potential to identify genes and molecular defects relevant to human development and numerous disease processes.

Institutional National Research Service Award in Sleep Research

Progress in understanding the neurobiology of sleep and awake states and pathophysiological mechanisms of sleep disorders, especially molecular and genetic aspects, has been hampered by an inadequate number of health professionals trained in sleep biology, sleep disorders medicine, and relevant research. The purpose of this training program is to ensure that scientists who are highly trained in sleep research are available in adequate numbers to address important gaps in our biomedical and biological understanding of sleep. The overall goal is to increase the number of sleep researchers who are available to investigate the basic biology of sleep; explore epidemiological, behavioral, and clinical aspects of sleep-related disorders; and develop new approaches for their treatment and prevention.

Mechanisms of the Immune Response to Xenotransplant Antigens

Because of the limited availability of human kidneys, hearts, and lungs, many patients die each year while waiting for organ transplants. The shortage of human organs has led to examination of the possibility of using nonhuman organs. The goal of this PA is to enhance our ability to transplant organs and tissues across species (xenotransplantation) by increasing our understanding of the human immune response to antigens present on the surface of organs or tissues of nonhuman species.

Methodology and Measurement in the Behavioral and Social Sciences

Advances in methodology and measurement go hand in hand with advances in substantive knowledge. The purpose of this PA is to improve

the quality and scientific power of data collected in behavioral and social sciences relevant to the mission of the NHLBI. Topics include processes that underlie self-reports, research design, data collection techniques, measurement, data analysis techniques, and ethical issues.

Mucosal Immunity in Pathogenesis and Prevention of Human Disease

The mucosal surface is one of the first important interfaces between pathogens and the host and as such is critical in prevention of infectious disease. The purpose of this PA is to stimulate basic and preclinical research into the human mucosal immune system and its regulation. Investigators are encouraged to study the mechanisms of response of the human mucosal immune system to disease-specific antigens. Research findings could lead to development of novel immune therapies for treatment or prevention of autoimmune and infectious diseases, including HIV infection and associated opportunistic infections.

Opportunities in AIDS Research Grant Program: Human Immunology

Understanding the normal development and functioning of the human immune system is crucial to understanding the effects of HIV on the immune system and the pathogenesis of AIDS. The purpose of this PA is to encourage novel and innovative research on characterization of T-lymphocyte homeostasis in humans under normal conditions, during HIV infection, or in the period after introduction of effective antiretroviral therapy. Special emphasis will be given to studies to develop and improve reagents and methodologies needed to enhance the ability to study immune function and lymphocyte dynamics in humans.

Pathogenesis and Therapy of Complications of Diabetes

Prevention and treatment of chronic complications are central therapeutic problems in type I diabetes mellitus. Studies show that exposure to glycemia is a dominant predictor of retinopathy and nephropathy and that intensive therapy reduces appearance and progression of these complications. The objective of this RFA is to study mechanisms by which hyperglycemia results in late complications of diabetes and to apply the information to develop interventions

for preventing, limiting, or reversing complications. Investigators will address pathogenic mechanisms common to the spectrum of complications of diabetes with an emphasis on the role of growth factors in the pathogenesis and treatment of diabetic complications.

Respiratory Pathogens: Specific Research Needs

Respiratory infections are the major cause of acute illnesses in the United States and, among infectious diseases, a major cause of morbidity and mortality worldwide. The purpose of this PA is to stimulate research that may lead to more effective and accepted prophylactic and therapeutic approaches for controlling severe respiratory infections. Research focusing on selected respiratory pathogens and the host responses to these pathogens is encouraged. An example is the role of surfactant and lung defensins in the lung host defenses against respiratory infections.

Tissue Engineering, Biomimetics, and Medical Implant Science (TEBMIS)

A firmer scientific and technical basis is needed before the next generation of medical implants, projected to be safe, reliable, "smart," and long-lasting, can be developed. Integrated and multidisciplinary research should advance our understanding of biological systems and provide the bases for design and development of novel synthetic medical materials that are compatible with the environment of the host and significantly increase the functional lifetime of implants. The objective of this initiative is to encourage multidisciplinary research in design and bioengineering of natural approaches for the repair, restoration, and replacement of tissues and whole organs based on a comprehensive scientific understanding of biological structures and their function. The overall goal is to facilitate development of a new generation of natural and synthetic medical implants.



6. Institute Public Advisory Committees

National Heart, Lung, and Blood Advisory Council

Structure

Chair: Claude Lenfant, M.D., Director, NHLBI

Executive Secretary: Ronald G. Geller, Ph.D.,
Director, Division of Extramural Affairs, NHLBI

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 National Heart, Lung, and Blood Advisory Council reviews applications for research grants, cooperative agreements, and training grants in heart, blood vessel, lung, and blood diseases and in blood resources, and recommends to the Director, NIH, scientific projects that merit support.

In its advisory role, the Council advises the Secretary, HHS, the Assistant Secretary for Health, HHS, and the Directors, NIH and NHLBI, on matters relating to the 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*

Claude Lenfant, M.D.
(Chair)

National Heart, Lung, and Blood Institute

Francois M. Abboud, M.D. (1999)
University of Iowa Hospital and Clinics

Donald Bartlett, Jr., M.D. (1999)
Dartmouth Medical School

William W. Busse, M.D. (2000)
University of Wisconsin Medical School

Harvey R. Colten, M.D. (1998)
Northwestern University Medical School

Valentin Fuster, M.D. (2000)
Mount Sinai School of Medicine

Cage S. Johnson, M.D. (2001)
University of Southern California

Shirki K. Kumanyika, Ph.D., M.P.H. (2000)
University of Illinois at Chicago

Carolyn C. Lopez, M.D. (2001)
Cook County Hospital

William J. Martin II, M.D. (2001)
Indiana University Medical Center

Alan Meisel, LL.B (1999)
University of Pittsburgh School of Law

Carmen Ramos-Bonoan, M.D. (1999)
New York City Department of Health

John D. Rudd, M.D. (1998)
Laverne, Tennessee

Judith A. Simpson (2000)
United Patients Association of Pulmonary
Hypertension

Judith L. Swain, M.D. (1998)
University of Pennsylvania

Reginald L. Washington, M.D. (1998)
University of Colorado Health Sciences Center

Paul K. Whelton, M.D. (2001)
Tulane University School of Public Health

Carolyn F. Whitsett, M.D. (2000)
Crawford Long Hospital of Emory University

Kenneth K. Wu, M.D. (1998)
University of Texas Medical School at Houston

Ex Officio Members

Yancy Y. Phillips, M.D.
Walter Reed Army Medical Center

Donna Shalala, Ph.D.
Department of Health and Human Services

Pamela Steele, M.D.
Department of Veterans Central Office

Harold Varmus, M.D.
National Institutes of Health

* Current as of October 1998. The current roster, containing full addresses for the NHLBI Advisory Council and Committees, can be obtained from the NHLBI's home page on the World Wide Web at <http://www.nhlbi.nih.gov/nhlbi/meet/meet.htm>.

Program Advisory and Review Committees

Sickle Cell Disease Advisory Committee

Chair: William C. Mentzer, Jr., M.D.,
San Francisco General Hospital

Executive Secretary: Vacant

The Sickle Cell Disease Advisory Committee advises the Secretary, HHS; the Assistant Secretary for Health, HHS; and the Directors of the NIH, NHLBI, and Division of Blood Diseases and Resources, NHLBI, on the Sickle Cell Disease Program and on suggested priorities within that program. The Committee also makes recommendations concerning planning, execution, and evaluation of all aspects of the program.

Membership*

Kenneth R. Bridges, M.D. (2000)
Harvard Medical School

Iris D. Buchanan, M.D. (1999)
The Southeast Permanente Medical Group

Jessica G. Davis, M.D. (1999)
Cornell University School of Medicine

Joseph DeSimone, Ph.D. (2000)
Veterans Administration West Side
Medical Center

Vipul Mankad, M.D. (2000)
University of Kentucky

Sonya I. Ross (2001)
Maryland Department of Health and Mental
Hygiene

Jeanne A. Smith, M.D., M.P.H. (2002)
Columbia University-Harlem Hospital

Paul S. Swerdlow, M.D. (2002)
Wayne State University School of Medicine

Tim M. Townes, Ph.D. (2002)
University of Alabama at Birmingham

Ex Officio Members

Harold E. Varmus, M.D.
National Institutes of Health

Major Scott A. Wegner
Walter Reed Army Institute of Research

Martin Steinberg, M.D.
Jackson Veterans Administration Medical Center

Michele Puryear, M.D.
Health Resources and Services Administration

William H. Hannon, Ph.D.
University of Illinois College of Medicine

Sleep Disorders Research Advisory Board

Chair: David P. White, M.D.
Brigham and Women's Hospital

Executive Secretary: James P. Kiley, Ph.D.,
Director, National Center on Sleep Disorders
Research, NHLBI, National Institutes of Health,
Bethesda, Maryland 20892, (301) 435-0199

The Sleep Disorders Research Advisory Board advises the Directors of the NIH, NHLBI, and National Center on Sleep Disorders Research on matters related to the scientific activities carried out by and through the Center and policies respecting 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. The Board advises the Director of the Center on areas and approaches that should be addressed by the Center's targeted programs, including the identification of basic, clinical, and health education topics of importance to national health fields.

Membership*

Carol Bell-Anderson (2002)
Patient Advocate-Narcolepsy
Edina, Minnesota

Martha U. Gillette, Ph.D. (1999)
University of Illinois

Carol Landis, D.N.Sc., R.N. (2002)
University of Washington

Morris L. Lyons (2000)
Consultant
Cleveland, Ohio

Emmanuel Mignot, M.D., Ph.D. (2002)
Stanford University School of Medicine

Richard P. Millman, M.D. (2001)
Rhode Island Hospital

* Current as of October 1998.

Michael Rosbash, Ph.D. (2001)
Brandeis University

Fred W. Turek, Ph.D. (2000)
Northwestern University

Carol U. Walker (2000)
Restless Legs Syndrome Foundation

Victoria P. West (Haulcy), M.P.H. (1999)
ATS Medical, Inc.

Ex Officio Members

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

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

F. J. Brinley Jr., Ph.D., M.D.
NINDS, National Institutes of Health

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

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

James P. Kiley, Ph.D.
NHLBI, National Institutes of Health

Claude Lenfant, M.D.
NHLBI, National Institutes of Health

Colonel Gregory Belenky
Walter Reed Army Institute of Research

Harold E. Varmus, M.D.
National Institutes of Health

Clinical Trials Review Committee

Chair: Alan D. Guerci, M.D.
St. Francis Hospital

Scientific Review Administrator: Joyce A. Hunter, Ph.D., Health Science Administrator, Division of Extramural Affairs, NHLBI, National Institutes of Health, Bethesda, Maryland 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*

Lennette J. Benjamin, M.D. (2002)
Montefiore Medical Center

Bernard R. Chaitman, M.D. (2002)
St. Louis University Health Sciences

Moses S.S. Chow, Pharm.D. (2000)
Hartford Hospital

Patricia J. Elmer, Ph.D. (2000)
University of Minnesota

Stephanie J. Green, Ph.D. (2002)
University of Washington

Kenneth A. Jamerson, M.D. (2000)
University of Michigan Medical Center

Robert C. Klesges, Ph.D. (1999)
The University of Memphis Prevention Center

Kerry L. Lee, Ph.D. (1999)
Duke University Medical Center

Naomi L. Luban, M.D. (2001)
Children's National Medical Center

Hiltrud S. Mueller, M.D. (1999)
Albert Einstein College of Medicine

Polly E. Parsons, M.D. (2000)
University of Colorado Health Sciences Center

Laura L. Perkins, Ph.D. (1999)
Dow Corning Corporation

Susan Redline, M.D., M.P.H. (2001)
Cleveland Veteran's Administration Medical
Center

Heart, Lung, and Blood Program Project Review Committee

Chair: Vernon S. Bishop, M.D.
University of Texas Health Sciences Center

Scientific Review Administrator: Jeffery H. Hurst, Ph.D., Health Scientist Administrator, Division of Extramural Affairs, NHLBI, National Institutes of Health, Bethesda, Maryland 20892, (301) 435-0303

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

* Current as of October 1998.

Membership*

Jerome A. Dempsey, Ph.D. (2001)
University of Wisconsin-Madison

Paul E. Dicorleto, Ph.D. (1999)
Cleveland Clinic Foundation

Claire M. Doerschuk, M.D. (2002)
Harvard University

David P. Hajjar, Ph.D. (2002)
Cornell University Medical College

Robert P. Hebbel, M.D. (1999)
University of Minnesota Medical School

Judith S. Hochman, M.D. (2000)
Columbia University

Maureane R. Hoffman, M.D., Ph.D. (2001)
Duke University Medical Center

Gary W. Hunninghake, M.D. (1999)
University of Iowa College of Medicine

Gary L. Larsen, M.D. (2001)
National Jewish Center for Immunology
and Respiratory Medicine

Eduardo Marban, M.D., Ph.D. (2000)
Johns Hopkins University School of Medicine

Russell M. Medford, M.D., Ph.D. (2001)
Emory University School of Medicine

Elizabeth G. Nabel, M.D. (1999)
University of Michigan Medical Center

Alberto Nasjletti, M.D. (1999)
New York Medical College

Dean Sheppard, M.D. (2002)
University of California, San Francisco

Leslie E. Silberstein, M.D. (2001)
University of Pennsylvania

Mary Sorci-Thomas, Ph.D. (2000)
Wake Forest University

Pearl T.C.Y. Toy, M.D. (2002)
University of California, San Francisco

National Heart, Lung, and Blood Institute Special Emphasis Panel

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

Board of Scientific Counselors

Chair: James T. Stull, Ph.D.
University of Texas Southwestern Medical Center
at Dallas

Executive Secretary: Edward D. Korn, Ph.D.,
Director, Division of Intramural Research,
NHLBI, National Institutes of Health, Bethesda,
Maryland 20892, (301) 496-2116

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

Membership*

John A. Glomset, M.D., Ph.D. (2000)
University of Washington

Lorraine J. Gudas, Ph.D. (2001)
Cornell University Medical Center

Heidi E. Hamm, Ph.D. (2002)
Northwestern University School of Medicine

Jeffrey M. Leiden, M.D., Ph.D. (1998)
University of Chicago

Christina C. Leslie, Ph.D. (2002)
National Jewish Medical and Research Center

Peter Libby, M.D. (2001)
Harvard Medical School

Florante A. Quiocho, Ph.D. (2002)
Baylor College of Medicine

Alan R. Tall, M.D. (2000)
Columbia University

* Current as of October 1998.





7. Fiscal Year 1998 Budget Overview

NHLBI Obligations by Budget Mechanism: Fiscal Year 1998

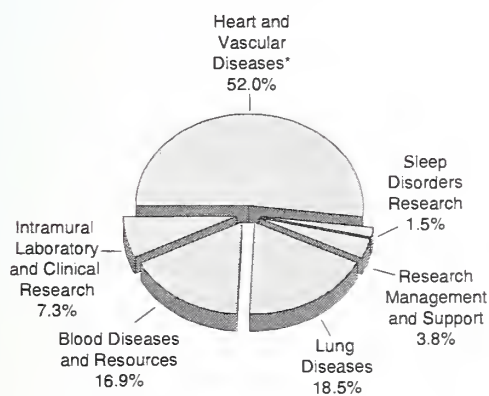
Budget Mechanism	Obligated Dollars FY 1998* (Dollars in Thousands)	Percent of Total NHLBI FY 1998 Budget
Research Project Grants†	\$1,009,152	66.1%
Specialized Centers of Research (SCORS)	95,467	6.3
Sickle Cell Centers	17,430	1.1
Center for AIDS Research	1,500	0.1
Other Research Grants	66,234	4.3
Research Careers Programs	(36,069)	(2.4)
Training Programs	50,606	3.3
Research and Development Contracts	116,705	7.6
Intramural Laboratory and Clinical Research	111,562	7.3
Research Management and Support‡	57,620	3.8
Research Facilities Construction Grants	0	0.0
Total, NHLBI	\$1,526,276	100.0%

* Excludes funds provided by other agencies by means of a reimbursable agreement.

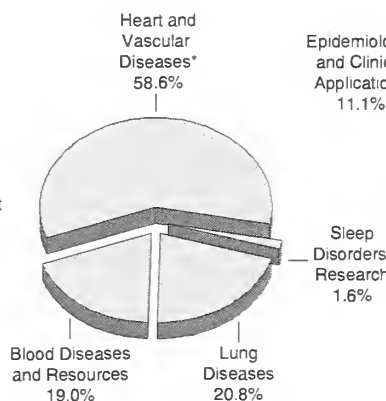
† Includes \$35,378 for Small Business Innovation Research (SBIR) Grants.

‡ Excludes OD and DIR research contracts, which are included in R & D contracts.

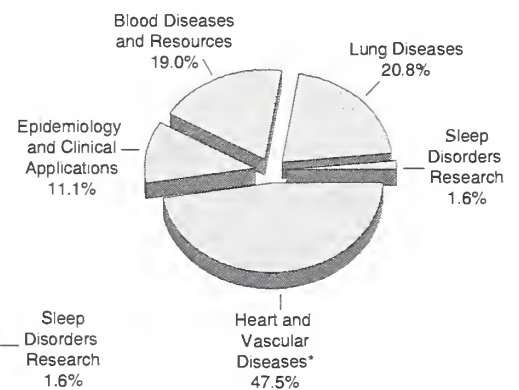
**NHLBI Total Obligations
by Budget Category**



**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 1998

- research grants, see Chapters 9 and 11;
- research and development contracts, see Chapters 10 and 11;
- research training and career development, see Chapter 12; and
- geographic distribution of awards, see Chapter 13.

NHLBI Obligations by Program: Fiscal Year 1998

Program	Obligated Dollars FY 1998 (Dollars in Thousands)	Percent of NHLBI Extramural FY 1998 Budget
Heart and Vascular Diseases*	\$795,588	58.6%
Lung Diseases	281,697	20.8
Blood Diseases and Resources	257,547	19.0
Sleep Disorders Research	22,262	1.6
Total, Extramural Obligations	\$1,357,094	100.0%

* Includes Heart and Vascular Diseases, as well as Epidemiology and Clinical Applications.

NHLBI Heart and Vascular Diseases Program* Obligations by Budget Mechanism: Fiscal Year 1998

Budget Mechanism	Obligated Dollars (Dollars in Thousands)	Percent of Program Budget
Research Project Grants	\$518,110	80.4%
Specialized Centers of Research (SCORS)	42,030	6.5
Other Research Grants	25,704	4.0
Research Career Programs	(14,813)	(2.3)
Training Programs	27,760	4.3
Research and Development Contracts	30,864	4.8
Total, Heart and Vascular Diseases	\$644,468	100.0%

* Includes Heart and Vascular Diseases only.

NHLBI Epidemiology and Clinical Applications Obligations by Budget Mechanism: Fiscal Year 1998

Budget Mechanism	Obligated Dollars (Dollars in Thousands)	Percent of Epidemiology and Clinical Applications Budget
Research Project Grants	\$95,917	63.5%
Specialized Centers of Research (SCORS)	0	0.0
Other Research Grants	5,301	3.5
Research Career Programs	(2,339)	(1.5)
Training Programs	2,881	1.9
Research and Development Contracts	47,021	31.1
Total, Epidemiology and Clinical Applications	\$151,120	100.0%

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

NHLBI Lung Diseases Program Obligations by Budget Mechanism: Fiscal Year 1998

Budget Mechanism	Obligated Dollars (Dollars in Thousands)	Percent of Program Budget
Research Project Grants	\$195,122	69.3%
Specialized Centers of Research (SCORS)	37,146	13.2
Other Research Grants	24,232	8.6
Research Career Programs	(11,487)	(4.1)
Training Programs	12,074	4.3
Research and Development Contracts	13,123	4.7
Total, Lung Diseases	\$281,697	100.0%

NHLBI Blood Diseases and Resources Program Obligations by Budget Mechanism: Fiscal Year 1998

Budget Mechanism	Obligated Dollars (Dollars in Thousands)	Percent of Program Budget
Research Project Grants	\$184,624	71.7%
Specialized Centers of Research (SCORS)	12,024	4.7
Sickle Cell Centers	17,430	6.8
Center for AIDS Research	1,500	0.6
Other Research Grants	9,174	3.6
Research Career Programs	(5,608)	(2.2)
Training Programs	7,099	2.8
Research and Development Contracts	25,696	10.0
Total, Blood Diseases and Resources	\$257,547	100.0%

NHLBI National Center on Sleep Disorders Research Obligations by Budget Mechanism: Fiscal Year 1998

Budget Mechanism	Obligated Dollars (Dollars in Thousands)	Percent of Program Budget
Research Project Grants	\$15,380	69.1%
Specialized Centers of Research (SCORS)	4,267	19.2
Other Research Grants	1,822	8.2
Research Career Programs	(1,822)	(8.2)
Training Programs	793	3.6
Research and Development Contracts	0	0.0
Total, Center on Sleep Disorders Research	\$22,262	100.0%

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



8. Long-Term Trends

Budget History of the NHLBI: Fiscal Years 1950-98

(Dollars in 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 ¹	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	12,276,325
1990	1,039,846	1,090,930	1,091,597	1,072,354	1,070,683	13,347,008
1991	1,112,502	1,135,589	1,137,235	1,126,942	1,125,915	14,472,923
1992	1,209,924	1,202,398	1,190,396	1,191,500	1,190,070	15,662,993
1993	1,245,396	1,228,455	1,228,455	1,214,792	1,214,693	16,877,686
1994	1,198,402	1,277,880	1,277,880	1,277,880	1,277,852	18,155,538
1995	1,266,961	1,259,590	1,259,590	1,258,472	1,314,969	19,470,507
1996	1,337,021	1,355,866	1,320,254 ²	1,355,866	1,351,422 ³	20,821,929
1997	1,320,555 ⁴	1,438,265	1,344,742 ⁴	1,432,529 ⁵	1,431,821	22,253,750
1998	1,467,189	1,513,004	1,531,898	1,526,284	1,526,276	23,780,026

¹ TQ=Transition Quarter, July 1-September 30, 1976.

² Senate Allowance reflects the Institute share of the government-wide rescission and the HHS rescission.

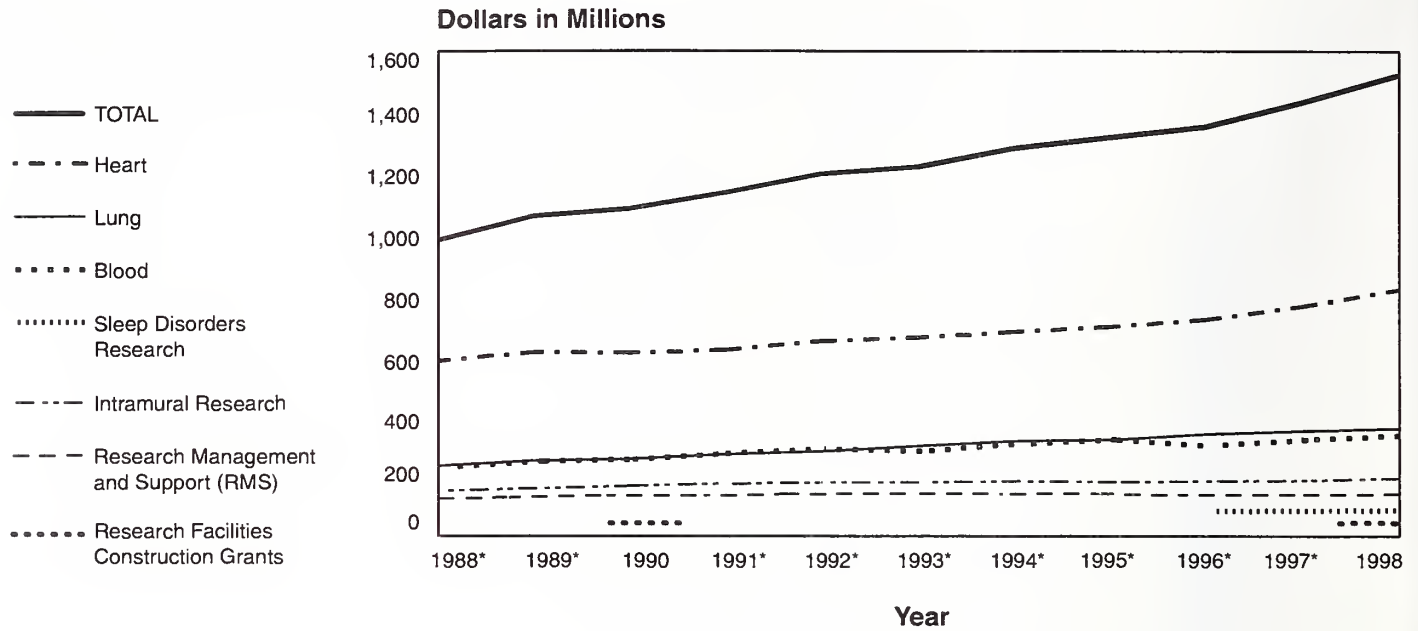
³ Obligations reflect the Institute share of the government-wide rescission, the HHS rescission, and a transfer to other NIH Institutes through the NIH Director's one percent transfer authority.

⁴ Excludes funds for AIDS research activities consolidated in the NIH Office of AIDS Research (OAR).

⁵ Excludes enacted administrative reduction.

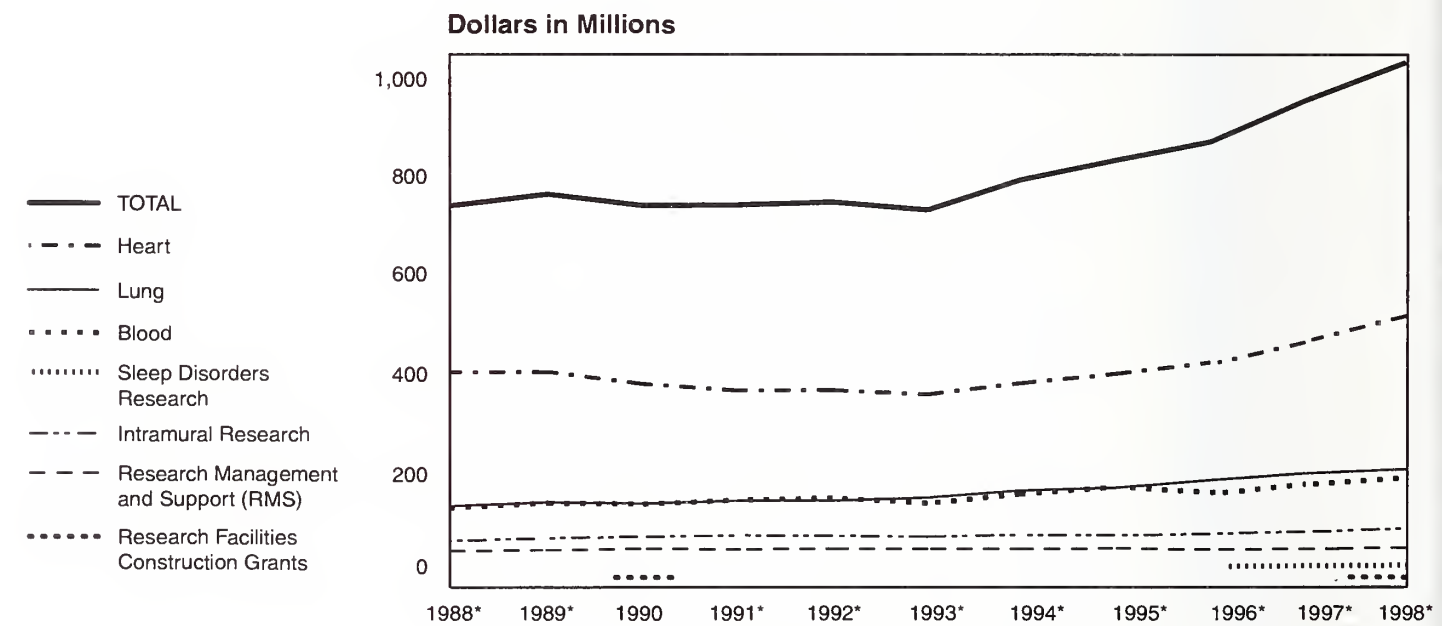
NHLBI Total Obligations by Budget Category: Fiscal Years 1988-98

Current Dollars



NHLBI Total Obligations by Budget Category: Fiscal Years 1988-98

Constant 1988 Dollars



* No funds were available for Research Facilities Construction Grants, FY 1988-89 and FY 1991-97.

NHLBI Total Obligations by Budget Category: Fiscal Years 1988-98

Current Dollars (Millions)

	Fiscal Year										
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Heart	\$552.2	\$581.7	\$579.6	\$589.6	\$619.5	\$632.0	\$651.7	\$668.9	\$692.8	\$737.9	\$795.6
Lung	154.3	171.4	177.0	193.8	203.4	221.6	238.7	243.0	261.9	273.4	281.7
Blood	148.7	169.3	175.2	195.9	211.9	203.5	227.4	244.6	224.3	242.7	257.5
Sleep Disorders Research	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.9	18.7	22.3
Intramural Research	68.0	77.0	85.5	93.7	97.1	98.2	101.7	98.9	101.8	104.4	111.6
Research Management and Support (RMS)	42.1	46.1	52.7	52.9	58.2	59.4	58.4	59.5	54.8	54.6	57.6
Research Facilities Construction Grants	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	\$965.3	\$1,045.5	\$1,070.7	\$1,125.9	\$1,190.1	\$1,214.7	\$1,277.9	\$1,314.9	\$1,351.4	\$1,431.8	\$1,526.3

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

Constant 1988 Dollars (Millions)

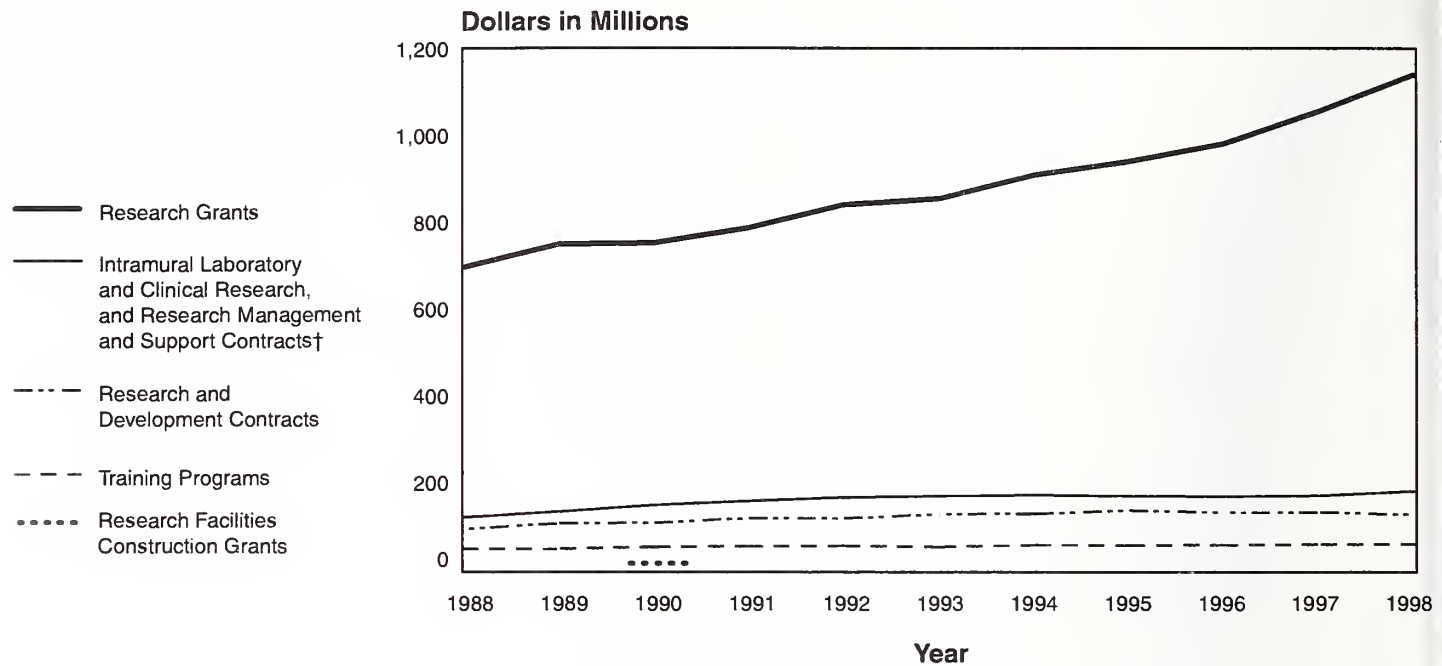
	Fiscal Year										
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998*
Heart	\$552.2	\$553.2	\$522.2	\$506.5	\$509.8	\$503.1	\$499.2	\$495.0	\$500.2	\$518.0	\$539.4
Lung	154.3	163.0	159.5	166.5	167.4	176.4	182.8	179.8	189.1	191.9	191.0
Blood	148.7	161.0	157.9	168.3	174.4	162.0	174.2	181.0	161.9	170.4	174.6
Sleep Disorders Research	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.5	13.1	15.1
Intramural Research	68.0	73.2	77.0	80.5	79.9	78.2	77.9	73.2	73.5	73.3	75.7
Research Management and Support (RMS)	42.1	43.8	47.5	45.4	47.9	47.3	44.7	44.0	39.6	38.3	39.1
Research Facilities Construction Grants	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	\$965.3	\$994.3	\$964.7	\$967.2	\$979.5	\$966.9	\$978.9	\$973.0	\$975.8	\$1,005.1	\$1,034.8

* 2.4% Inflation Factor used to calculate for FY 1998.

This table is based on the Biomedical Research & Development Price Index (January 1997).

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

NHLBI Total Obligations by Budget Mechanism: Fiscal Years 1988-98



NHLBI Total Obligations by Budget Mechanism: Fiscal Years 1988-98

(Dollars in Millions)

Budget Mechanism	Fiscal Year										
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Research Grants*	\$731.8	\$785.7	\$788.9	\$824.9	\$880.4	\$895.3	\$951.2	\$982.6	\$1,025.4	\$1,100.9	\$1,189.8
Research and Development (R&D) Contracts	83.9	96.7	98.4	108.7	107.7	117.5	118.3	125.9	120.9	121.9	116.7
Training Programs	39.5	39.9	44.4	45.8	46.7	44.3	48.3	48.0	48.5	49.8	50.6
Intramural Laboratory and Clinical Research (DIR), and Research Management and Support (RMS)†	110.1	123.2	138.3	146.5	155.3	157.6	160.1	158.4	156.6	159.1	169.2
Research Facilities Construction Grants	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total, NHLBI	\$965.3	\$1,045.5	\$1,070.7	\$1,125.9	\$1,190.1	\$1,214.7	\$1,227.9	\$1,314.9	\$1,351.4	\$1,431.8	\$1,526.3

* Includes Research Career Programs.

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

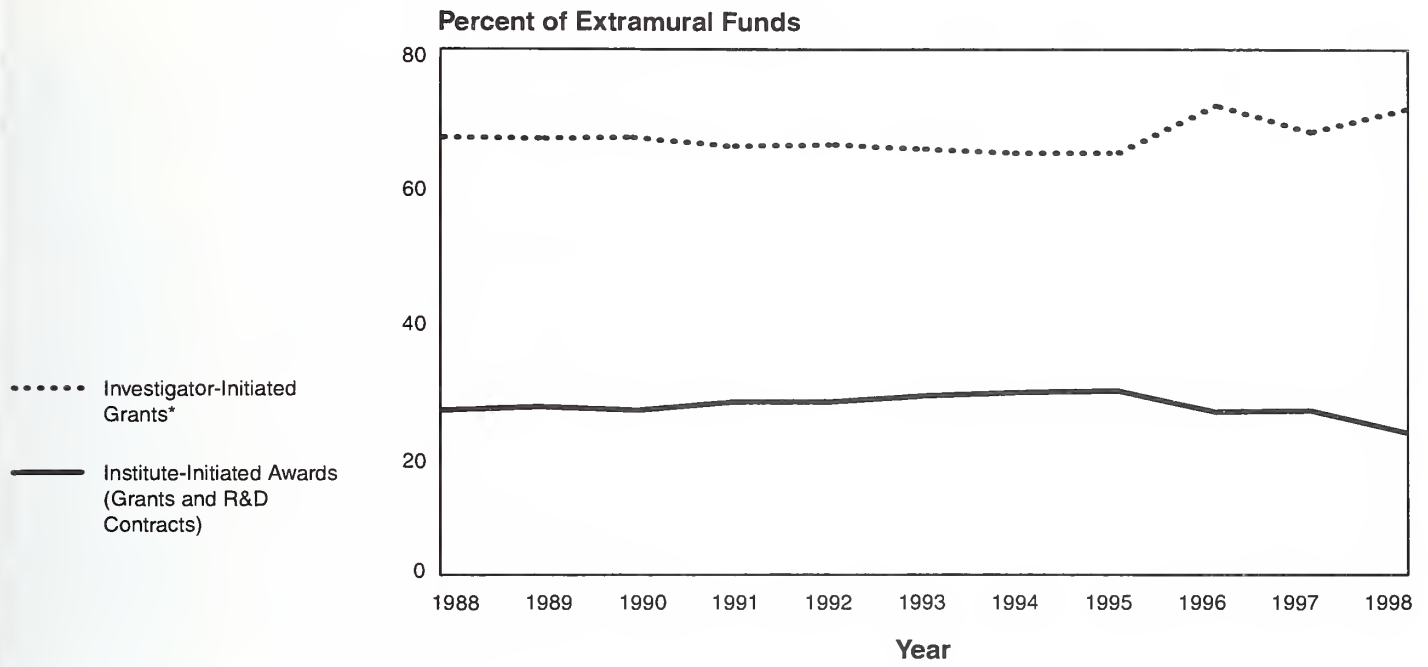
NHLBI Employment: Fiscal Years 1988-98

Staff	Fiscal Year										
	1988*	1989*	1990*	1991	1992	1993	1994	1995	1996	1997	1998
FTEs=	865	842	845	891	931	911	854	822	834	829	840

* Excludes Developmental Programs (SIS, Co-op) which were ceiling exempt, FY 1987-90.

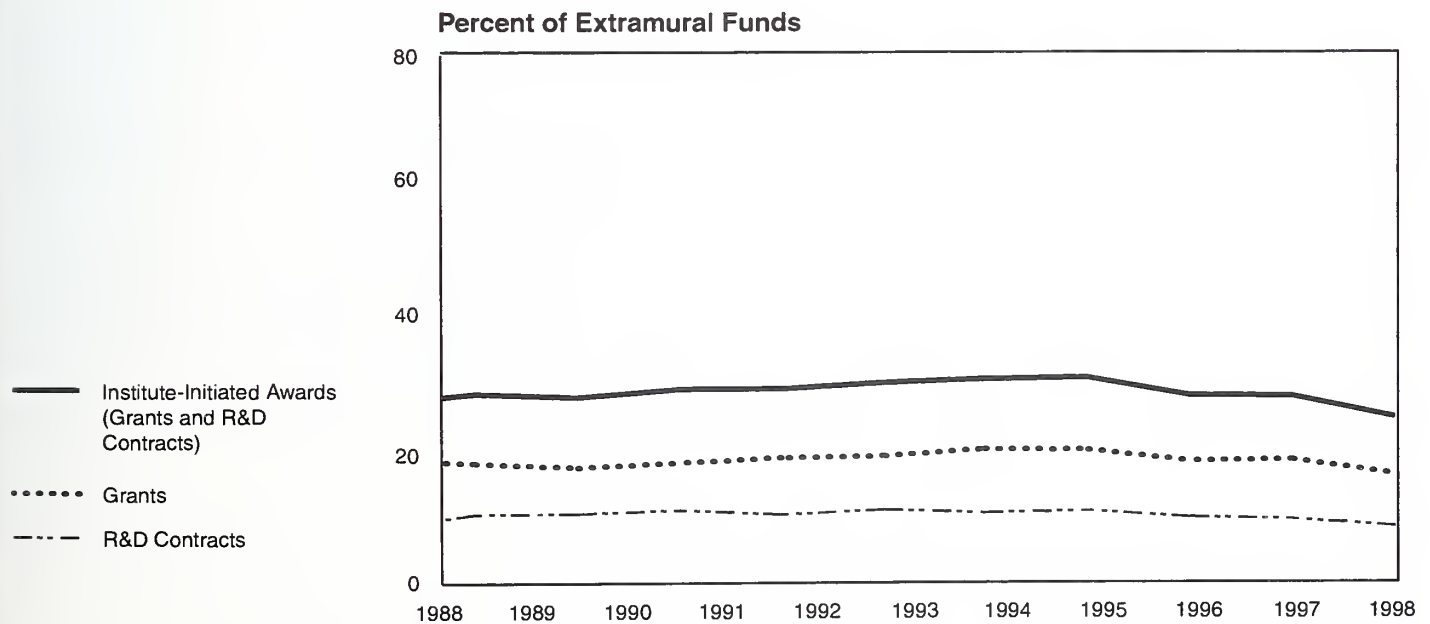
† Full-time equivalents.

NHLBI Institute-Initiated and Investigator-Initiated Awards: Fiscal Years 1988-98



* Includes Research Career Programs.

NHLBI Grants and Research and Development Contracts as Subsets of Institute-Initiated Awards: Fiscal Years 1988-98



NHLBI Extramural Programs: Fiscal Years 1988-98

Dollars

Budget Mechanism	(Dollars in Millions)											
	1988	1989	1990	1991	1992	Fiscal Year		1995	1996	1997	1998	
						1993	1994					
Investigator-Initiated Awards												
Investigator-Initiated Grants*	\$548.7	\$592.5	\$598.1	\$616.3	\$654.8	\$663.2	\$669.7	\$725.0	\$815.5	\$835.3	\$930.5	
Research Career Programs K04, K06	21.0	20.3	21.5	22.8	23.0	23.1	25.1	25.7	28.9	28.9	36.1	
Subtotal	569.7	612.8	619.6	639.1	677.8	686.3	724.8	750.7	844.4	864.2	966.6	
Institute-Initiated Awards												
Grants (RFAs)	162.1	173.0	169.4	185.8	202.6	209.0	226.4	231.9	216.8	236.8	\$223.2	
(Centers)	(88.9)	(87.9)	(88.4)	(92.2)	(96.5)	(96.6)	(101.5)	(107)	(87.5)	(87.7)	(114.4)	
R&D Contracts (RFPs)	83.9	96.7	98.4	108.7	107.7	117.5	118.3	125.9	116.7	121.9	116.7	
Subtotal	246.0	269.7	267.8	294.5	310.3	326.5	344.7	357.8	333.5	358.7	339.9	
Training	39.5	39.9	44.4	45.8	46.7	44.3	48.2	48.0	48.5	49.8	50.6	
Total, Extramural	\$855.2	\$922.4	\$931.8	\$979.4	\$1,034.8	\$1,057.1	\$1,117.7	\$1,156.5	\$1,226.4	\$1,272.7	\$1,357.1	

NHLBI Extramural Programs: Fiscal Years 1988-98

Percent

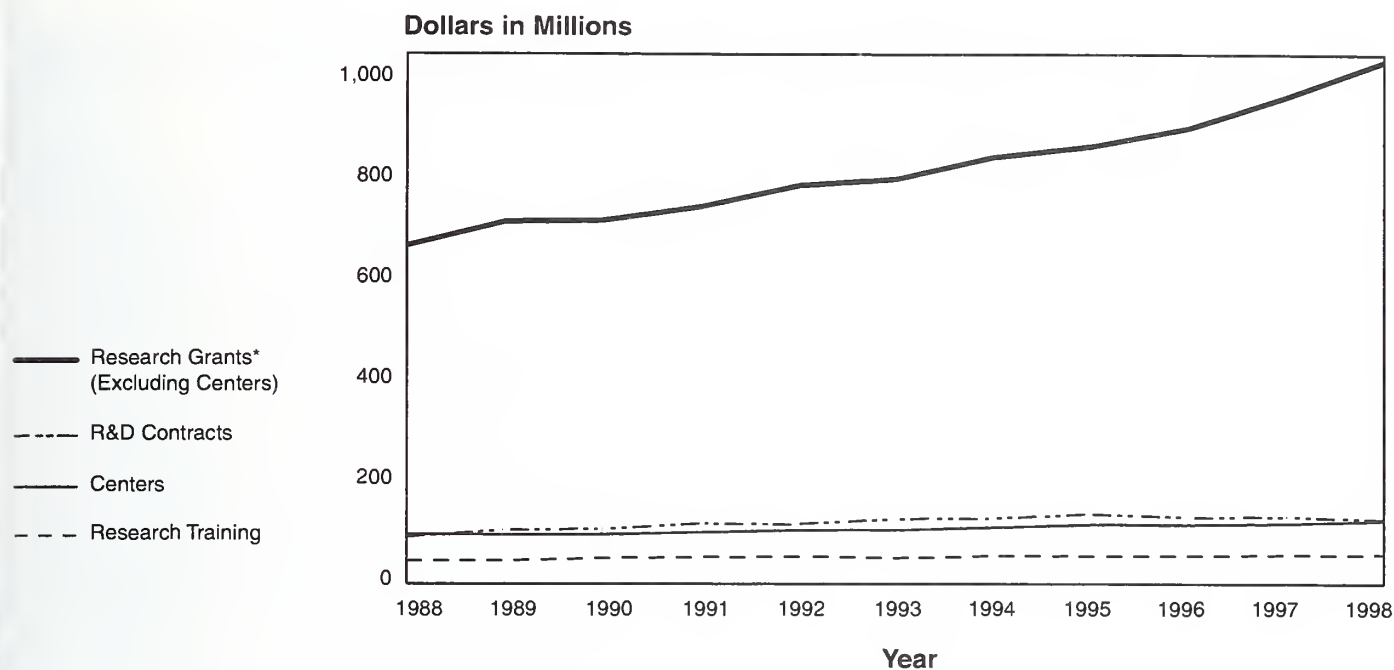
Budget Mechanism	(As Percent of Total Extramural Funds)											
	1988	1989	1990	1991	1992	Fiscal Year		1995	1996	1997	1998	
						1993	1994					
Investigator-Initiated Awards												
Investigator-Initiated Grants*	64.2	64.2	64.0	62.9	63.2	62.7	62.6	62.7	69.2	65.6	68.5	
Research Career Programs K04, K06	2.4	2.3	2.6	2.3	2.3	2.2	2.3	2.2	2.5	2.3	2.6	
Subtotal	66.6	66.5	66.6	65.2	65.5	64.9	64.9	64.9	71.7	67.9	71.2	
Institute-Initiated Awards												
Grants (RFAs)	19.0	18.7	18.1	19.0	19.6	19.8	20.2	20.1	18.4	18.6	16.4	
(Centers)	(10.4)	(9.5)	(9.5)	(9.4)	(9.3)	(9.1)	(9.1)	(9.2)	(7.4)	(6.9)	(8.4)	
R&D Contracts (RFPs)	9.8	10.5	10.6	11.1	10.4	11.1	10.6	10.9	9.9	9.6	8.5	
Subtotal	28.8	29.2	28.6	30.1	30.0	30.9	30.8	31.0	28.3	28.2	25.0	
Training	4.6	4.3	4.8	4.7	4.5	4.2	4.3	4.1	4.1	3.9	3.7	
Total, Extramural	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

* Includes all R18s.

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

NHLBI Extramural Research Funding Mechanism: Fiscal Years 1988-98

Dollars



NHLBI Extramural Research Funding Mechanism: Fiscal Years 1988-98

Dollars

(Dollars in Millions)

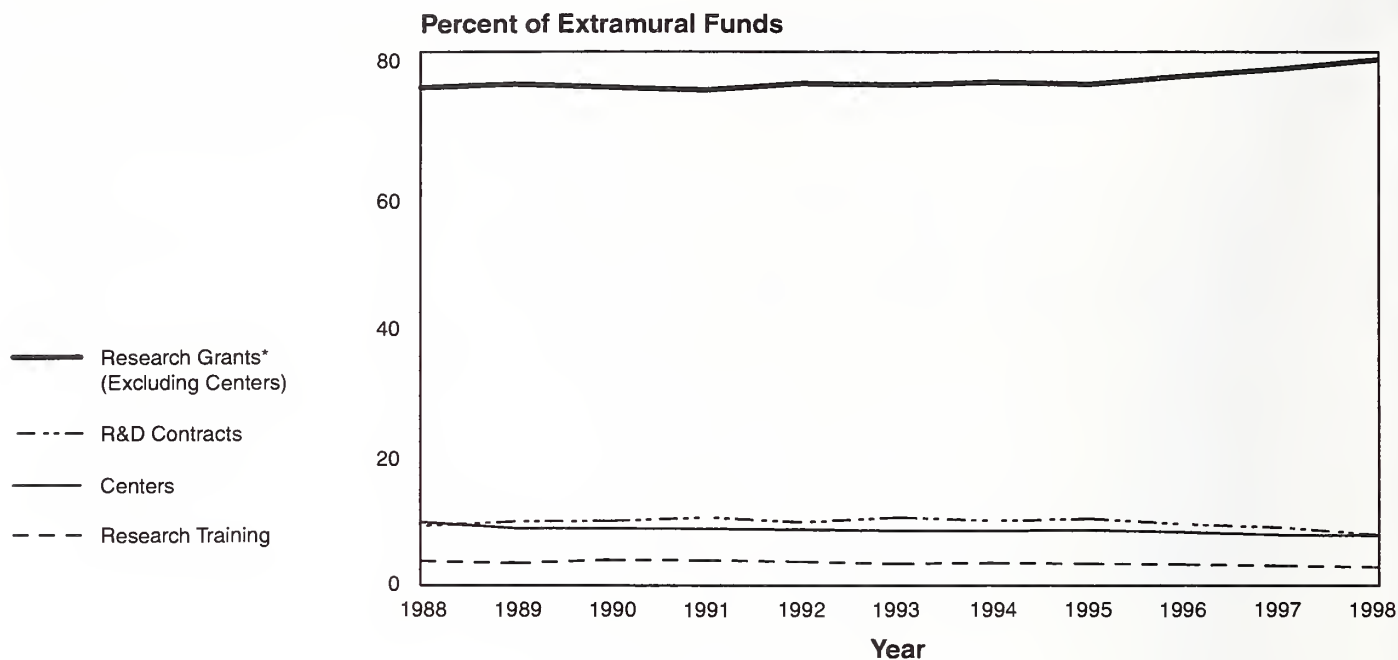
Budget Mechanism	Fiscal Year										
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Research Grants* (Excluding Centers)	\$642.9	\$697.9	\$700.6	\$732.7	\$783.9	\$798.7	\$849.7	\$875.7	\$918.7	\$992.3	\$1,075.4
Centers	88.9	87.9	88.4	92.2	96.5	96.6	101.5	107.0	106.7	108.7	114.4
R&D Contracts	83.9	96.7	98.4	108.7	107.7	117.5	118.3	125.9	120.9	121.9	116.7
Research Training	39.5	39.9	44.4	45.8	46.7	44.3	48.3	48.0	48.5	49.8	50.6
Total, Extramural	\$855.2	\$922.4	\$931.8	\$979.4	\$1,034.8	\$1,057.1	\$1,117.8	\$1,156.6	\$1,194.8	\$1,272.8	\$1,357.1

* Includes Research Career Programs.

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

NHLBI Extramural Research Funding Mechanism: Fiscal Years 1988-98

Percent



NHLBI Extramural Research Funding Mechanism: Fiscal Years 1988-98

Percent

Budget Mechanism	(Percent)										
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Research Grants* (Excluding Centers)	75.2	75.7	75.2	74.8	75.8	75.6	76.0	75.7	76.9	78.0	79.4
Centers	10.4	9.5	9.5	9.4	9.3	9.1	9.1	9.2	8.9	8.5	8.4
R&D Contracts	9.8	10.5	10.6	11.1	10.4	11.1	10.6	10.9	10.1	9.6	8.5
Research Training	4.6	4.3	4.8	4.7	4.5	4.2	4.3	4.2	4.1	3.9	3.7
Total, Extramural	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

* Includes Research Career Programs.

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



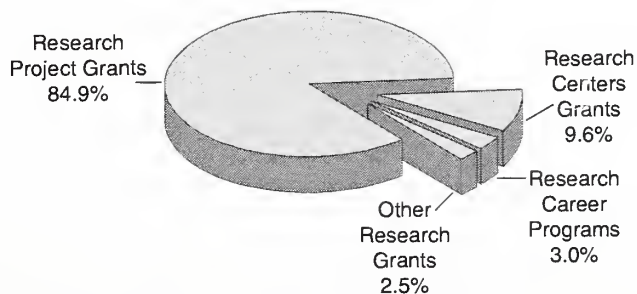
9. Research Grants

NHLBI Research Grants by Activity: Fiscal Year 1998

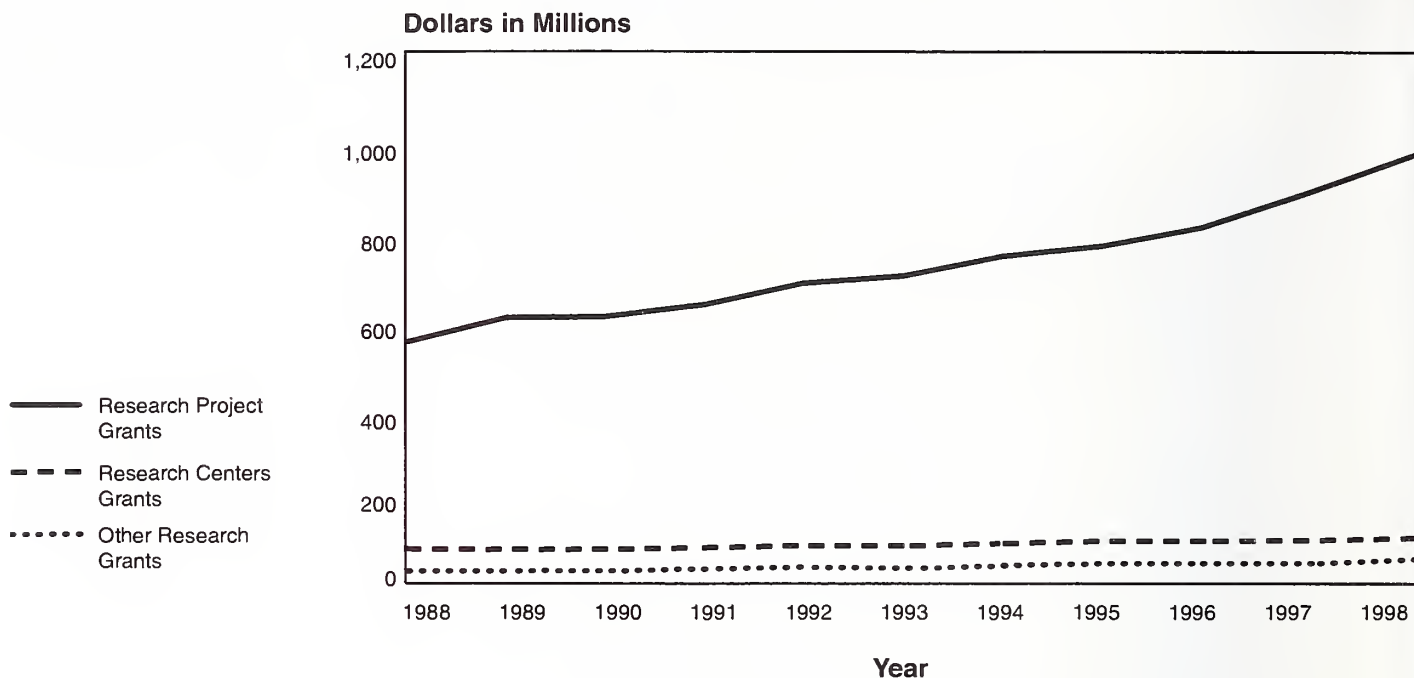
	Number of Grants	Total Cost (Dollars in Thousands)	Percent of Total NHLBI Research Grant Dollars
Research Project Grants (RPGs)			
Regular Research Grants (R01)	2,413	\$654,586	55.02%
Small Research Grants (R03)	11	664	0.06
Program Project Grants (P01)	140	208,477	17.52
Cooperative Agreements (U01)	81	43,674	3.67
Area Grants (R15)	1	8	0.00
Explorative Developmental Grant (R21)	12	1,352	0.11
Transition Award (R29)	312	32,686	2.75
Method to Extend Research in Time (R37)	103	32,327	2.72
Subtotal	3,073	973,774	81.84
Small Business Technology Transfer (STTR Phase I) (R41)	14	1,392	0.12
Small Business Technology Transfer (STTR Phase II) (R42)	4	866	0.07
Small Business Innovation Research (SBIR Phase I) (R43)	71	7,049	0.59
Small Business Innovation Research (SBIR Phase II) (R44)	73	26,071	2.19
Subtotal, Small Business	162	35,378	2.97
Subtotal, Research Project Grants	3,235	1,009,152	84.82
Research Center Grants			
Specialized Centers of Research (SCOR) (P50)	69	95,467	8.02
Sickle Cell Centers (P60)	10	17,430	1.46
Center for AIDs Research (P30)	0	1,500	0.13
Subtotal, Research Centers Grants	79	114,397	9.61
Research Career Programs			
Mentored Research Development Award for Minority Faculty (K01)	19	1,824	0.15
Minority Institutional Faculty Mentored Research Scientist Award (K01)	0	0	0.00
Research Scientist Development Award (K02)	14	933	0.08
Research Career Development Award (K04)	10	684	0.06
Research Career Award (K06)	3	103	0.01
Systemic Pulmonary and Vascular Diseases Academic Award (K07)	3	386	0.03
Asthma Academic Award (K07)	6	509	0.04
Nutrition Academic Award (K07)	10	1,492	0.13
Tuberculosis Academic Award (K07)	20	1,565	0.13
Sleep Academic Award (K07)	20	1,734	0.15
Clinical Investigator Scientist Award (K08)	278	23,122	1.94
Minority School Faculty Development Award (K14)	37	3,717	0.31
Research Development Award for Minority Faculty (K14)	0	0	0.00
Subtotal, Research Career Programs	420	36,069	3.03
Other Research Grants			
Cooperative Clinical Research (U10, R10)	52	21,736	1.83
Minority Biomedical Research Support (S06, S14)	—	2,978	0.25
Other (R09, R13, R25, T15, U09, U24)	23	5,451	0.46
Subtotal, Other Research Grants	75	30,165	2.54
Total, NHLBI Research Grants	3,809	\$1,189,783	100.00%

For descriptions of grants, see page 154.

NHLBI Total Research Grants by Category



NHLBI Research Project Grant,* Research Centers Grant, and Other Research Grant Obligations: Fiscal Years 1988-98



NHLBI Research Project Grant,* Research Centers Grant, and Other Research Grant Obligations: Fiscal Years 1988-98

(Dollars in Thousands)

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Research Project Grants	\$603,861	\$658,388	\$660,722	\$688,330	\$736,232	\$752,978	\$797,092†	\$819,674‡	\$862,027‡§	\$935,322‡	\$1,009,152‡
Research Centers Grants	88,947	87,870	88,382	92,174	96,510	96,628	101,535	106,980	106,688	108,665	114,397
Other Research Grants†	38,999	39,524	39,841	44,387	47,656	45,654	52,576	55,974	56,692	56,993	66,234
Total	\$731,807	\$785,782	\$788,945	\$824,891	\$880,398	\$895,260	\$951,203	\$982,628	\$1,025,407	\$1,100,980	\$1,189,783

* Includes P01s.

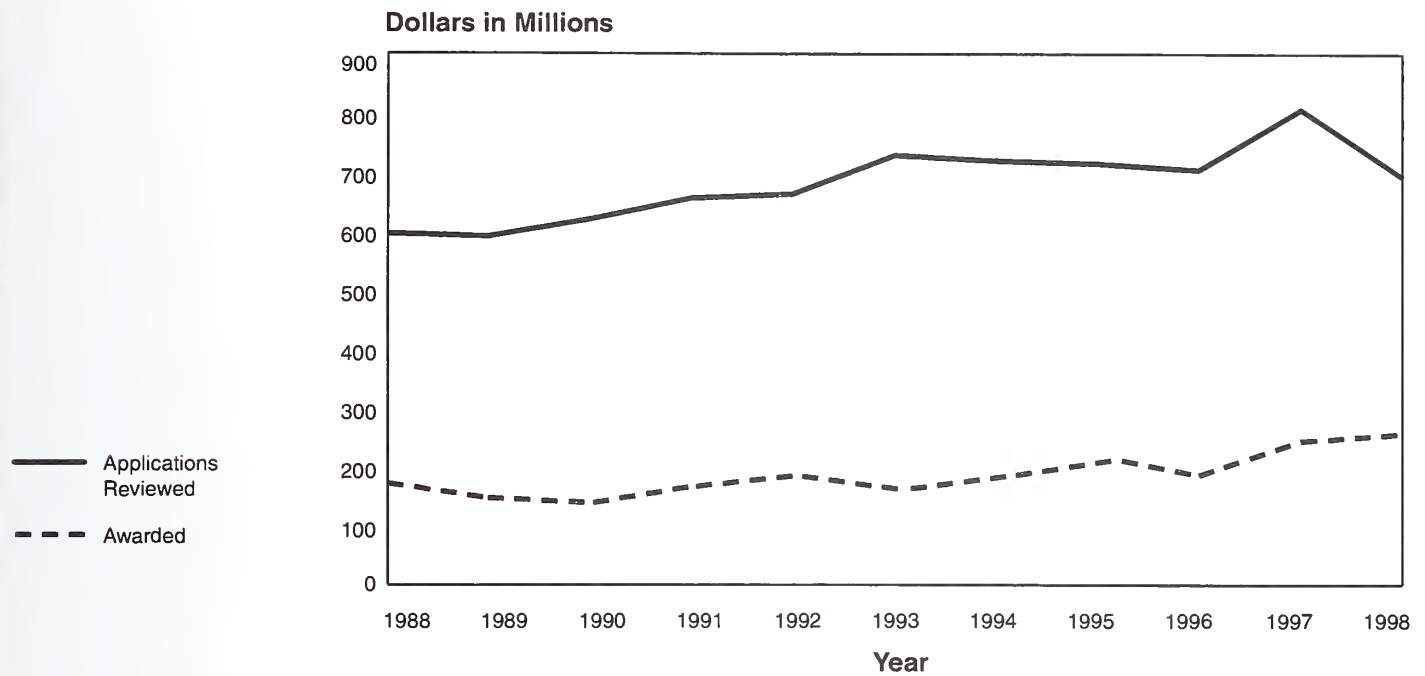
† Includes Research Career Programs; excludes General Research Support Grants.

‡ Includes R03, R41, R42, R43, and R44s.

§ Includes Program Evaluation Assessment of \$4,435,000.

NHLBI Competing Research Project Grant Applications*: Fiscal Years 1988-98

Total Cost Dollars Reviewed and Awarded



NHLBI Competing Research Project Grant Applications*: Fiscal Years 1988-98

Total Cost Dollars Reviewed and Awarded

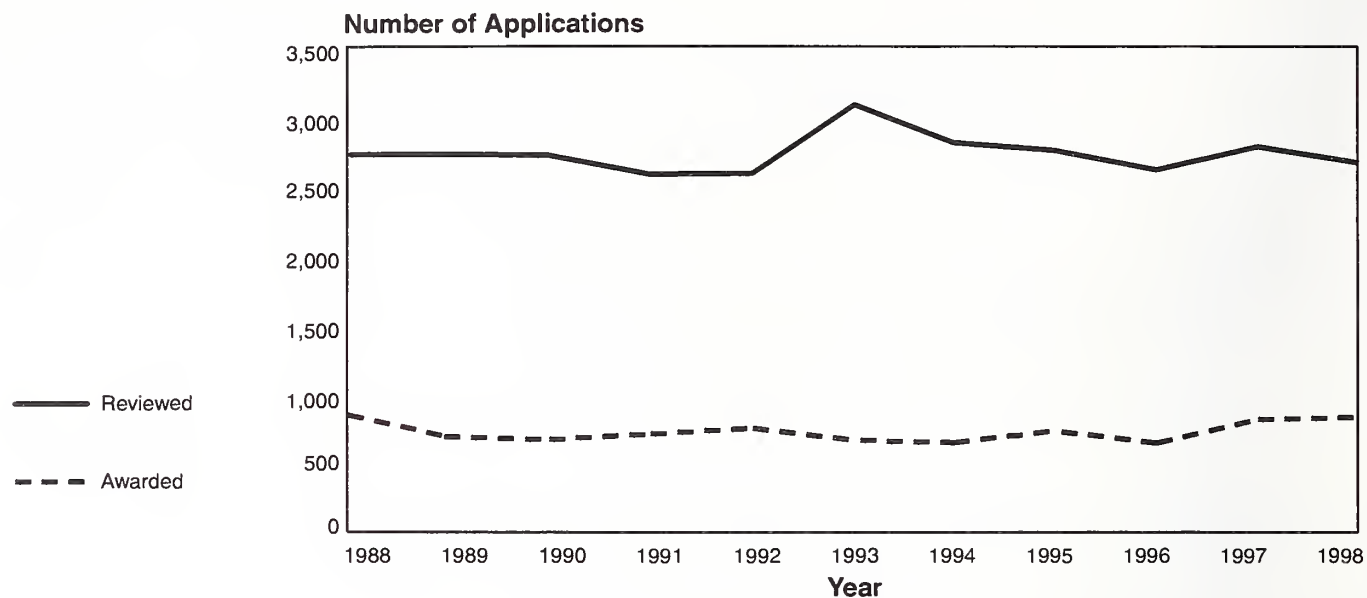
(Dollars in Millions)

	Fiscal Year										
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Applications Reviewed	\$590.9	\$585.8	\$614.9	\$650.8	\$658.4	\$724.3	\$715.0	\$710.3	\$699.2	\$802.1	\$687.1
Awarded	168.2	143.1	134.8	162.8	181.3	158.0	180.4	207.5	182.1	240.1	252.4

* Includes R01, R23, R43, R44, P01, U01 grants; R37 grants (beginning in FY 1986); R29 grants (beginning in FY 1987); R03 grants (beginning in FY 1994); and excludes R41, R43, and R44 grants (beginning in FY 1994).

NHLBI Competing Research Project Grant Applications*: Fiscal Years 1988-98

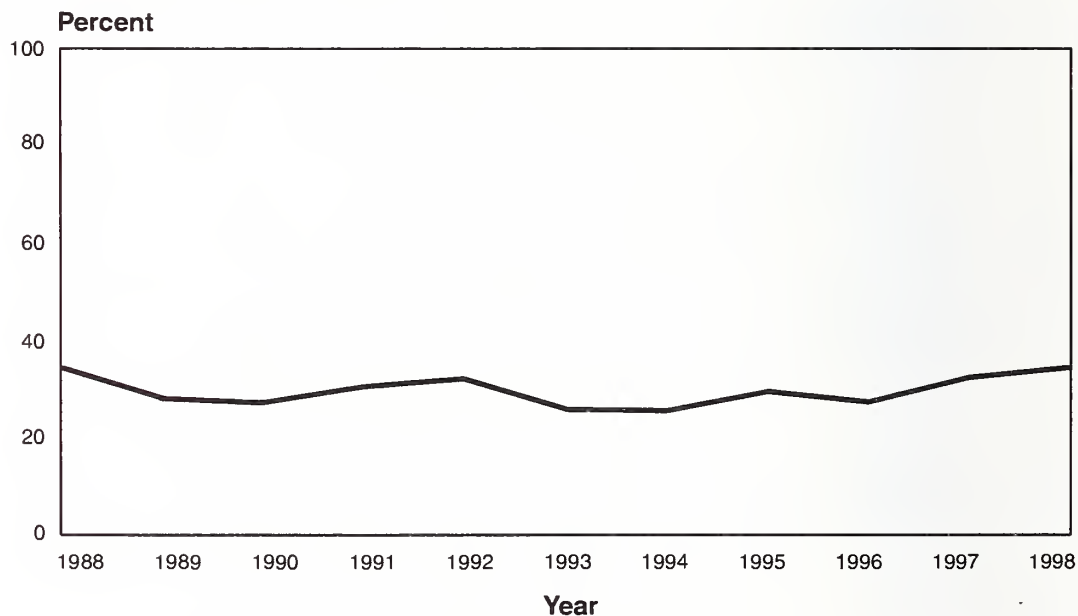
Number Reviewed and Awarded



(Number of Applications)

	1988	1989	1990	1991	1992	Fiscal Year 1993	1994	1995	1996	1997	1998
Applications Reviewed	2,714	2,716	2,707	2,571	2,580	3,072	2,801	2,744	2,605	2,771	2,657
Awarded	851	698	675	717	759	673	655	740	652	821	837

Percent of Reviewed Applications Funded (Success Rate)

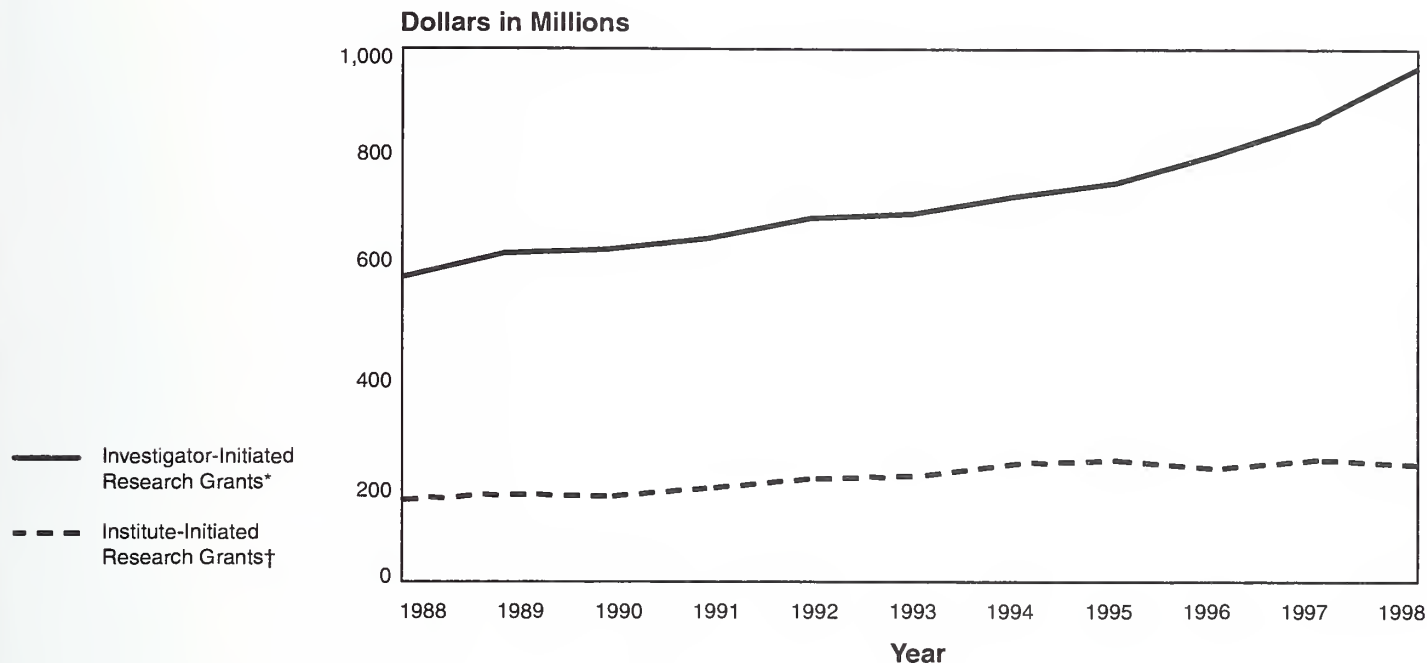


(Percent)

	1988	1989	1990	1991	1992	Fiscal Year 1993	1994	1995	1996	1997	1998
Success Rates	33.2	25.9	24.4	26.6	28.8	21.1	23.4	27.0	25.0	29.6	31.5

* Includes R01, R23, R43, R44, P01, U01 grants; R37 grants (beginning in FY 1986); and R29 grants (beginning in FY 1987); R03 grants (beginning in FY 1994); and excludes R41, R43, and R44 grants (beginning in FY 1994).

NHLBI Investigator-Initiated and Institute-Initiated Research Grant Obligations: Fiscal Years 1988-98



NHLBI Investigator-Initiated and Institute-Initiated Research Grant Obligations: Fiscal Years 1988-98

(Dollars in Millions)

	Fiscal Year										
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Investigator-Initiated*	\$574.6	\$618.1	\$625.0	\$645.8	\$683.9	\$692.8	\$724.8	\$750.7	\$804.1	\$867.9	\$966.6
Institute-Initiated†	157.2	167.7	164.0	179.1	196.5	202.5	226.4	231.9	216.8	233.0	223.2
Total	\$731.8	\$785.8	\$789.0	\$824.9	\$880.4	\$895.3	\$951.2	\$982.6	\$1,020.9‡	\$1,100.9	\$1,189.8

* Includes R01, R23, R43, R44, P01, U01 grants; R37 grants (beginning in FY 1986); R29 grants (beginning in FY 1987); R03 grants (beginning in FY 1994). Includes Research Career Programs; R55 (beginning in FY 1995).

† Including 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 1988-98

(Dollars in Millions)

Fiscal Year	Competing			Total	Noncompeting	Total Noncompeting and Competing
	New Competing	Renewal Competing	Competing Supplements			
1988	\$80.2	\$92.2	\$3.2	\$175.6	\$428.2	\$603.8
1989	77.5	70.5	1.7	149.7	508.7	658.4
1990	68.4	72.6	1.5	142.5	518.2	660.7
1991	84.0	86.0	1.6	171.6	516.7	688.3
1992	88.5	101.2	0.5	190.2	546.0	736.2
1993	89.9	79.1	0.6	169.6	583.4	753.0
1994	99.7	79.6	1.1	180.4	599.9	780.3
1995	111.1	94.5	1.9	207.5	588.4	795.9
1996	90.5	90.4	1.2	182.1	649.9	832.0
1997	135.8	104.0	.3	240.1	662.4	902.5
1998	147.5	103.9	1.0	252.4	721.3	973.7

Facility and Administrative (F&A)[†] Rates of NHLBI Research Project Grants : Fiscal Years 1988-98

(Dollars in Thousands)

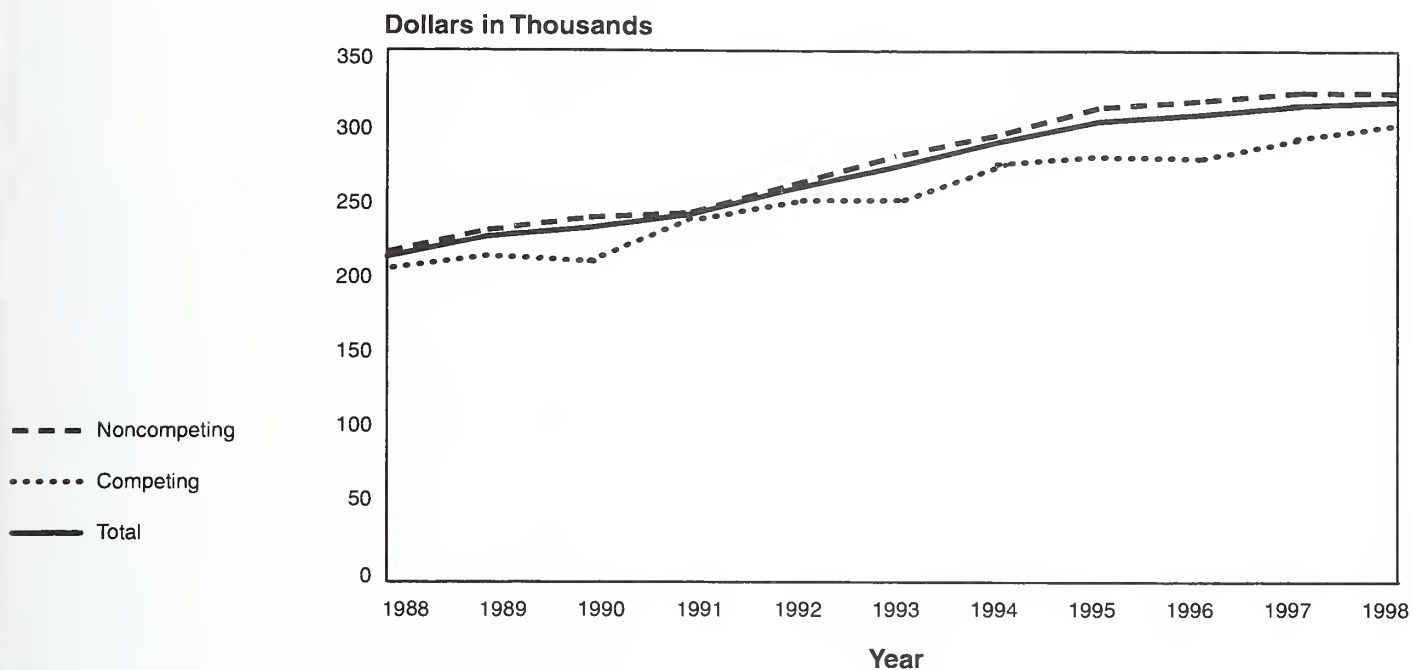
Fiscal Year	Direct Cost	F&A Cost [†]	F&A Cost as a Percent of Direct Cost	Total Cost
1988	\$415,471	\$188,390	45.3	\$603,861
1989	452,557	205,831	45.5	658,388
1990	450,497	210,225	46.7	660,722
1991	470,623	217,707	46.3	688,330
1992	503,076	233,156	46.3	736,232
1993	516,022	236,956	45.9	752,978
1994	534,374	245,965	46.0	780,339
1995	543,502	252,423	46.4	795,925
1996	564,219	267,785	47.5	832,004‡
1997	611,576	290,915	47.6	902,491
1998	660,009	313,765	47.5	973,774

* Includes R01, R23, P01 grants; R43 grants (beginning in FY 1983); R44 grants (beginning in FY 1984); U01 grants (beginning in FY 1985); R37 grants (beginning in FY 1986); R29 grants (beginning in FY 1987); R03 grants (beginning in FY 1994); and excludes \$23.7 million in R41, R43, and R44 grants (beginning in FY 1994).

† Previously called Indirect Cost.

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

NHLBI Research Project Grants*: Average Cost, Fiscal Years 1988-98



NHLBI Research Project Grants*: Average Cost, Fiscal Years 1988-98

(Dollars in Thousands)

	Fiscal Year										
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Noncompeting	\$217.2	\$231.5	\$239.9	\$243.2	\$261.7	\$281.0	\$294.8	\$312.8	\$317.5	\$323.0	\$322.6
Competing	206.4	214.5	211.1	239.3	251.4	252.0	275.5	280.4	279.3	292.5	301.6
Total	\$214.0	\$227.4	\$233.1	\$242.2	\$259.0	\$273.9	\$290.1	\$303.7	\$308.3	\$314.2	\$316.9

* Includes R01, R23, R43, R44, P01, U01 grants; R37 grants (beginning in FY 1986); and R29 grants (beginning in FY 1987); R03 grants (beginning in FY 1994); and excludes R41, R43, and R44 grants (beginning in FY 1994).

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 1998	Total FY 1998 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Bypass Angioplasty Revascularization Investigation (BARI) Data Coordinating Center	\$44,754,700	\$1,360,006	\$46,114,706
Child and Adolescent Trial for Cardiovascular Health (CATCH) III Tracking Study Coordinating Center	35,181,938	571,758	35,753,696
Depression and Mortality Following Myocardial Infarction	633,379	522,055	1,155,434
Dietary Patterns, Sodium Intake, and Blood Pressure (DASH2)	2,233,363	3,692,793	5,926,156
Dynamic Evaluation of Percutaneous Coronary Intervention	606,795	627,432	1,234,227
Early Natural History of Arteriosclerosis	1,062,791	1,226,646	2,289,437
Estrogen Replacement and Atherosclerosis (ERA) Trial	3,561,854	1,667,501	5,229,355
Family Heart Study (FHS)—Molecular Genetics and Genetic Epidemiology	3,600,090	1,884,306	5,484,396
Genetic Determinants of Hypertension	4,191,377	2,267,946	6,459,323
Glucose Tolerance and Risk for CVD in the Elderly	379,432	387,021	766,453
Insulin Resistance and Atherosclerosis Study (IRAS)	12,640,007	3,099,999	15,740,006
Mode Selection Trial in Sinus Node Dysfunction (MOST)	6,115,664	1,699,487	7,815,151
NHLBI Growth and Health Study	15,181,943	1,766,003	16,947,946
Obesity Prevention in American Indians (PATHWAYS)	13,203,608	3,945,374	17,148,982
Postmenopausal Hormone Replacement Therapy (HRT) After CABG	720,342	175,432	895,774
PREMIER: Lifestyle Interventions for Blood Pressure Control	—	2,234,393	2,234,393
Randomized Evaluation of Mechanical Assistance for the Treatment of Chronic Heart Failure (REMATCH)	1,257,604	1,798,390	3,055,994
Rapid Early Action for Coronary Treatment (REACT)	15,557,661	495,622	16,053,283
Strong Heart Study—CVD in American Indians	16,157,494	3,822,330	19,979,824
Sudden Cardiac Death in Heart Failure (SCD-HeFT)	1,570,932	1,667,152	3,238,084
Women's Estrogen/Progestin Lipid-Lowering Hormone Atherosclerosis Regression Trial (WELL-HART)	2,502,536	1,269,545	3,772,081
Subtotal, Heart and Vascular Diseases	181,113,510	36,181,191	213,522,620
Lung Diseases			
Collaborative Studies on the Genetics of Asthma (CSGA)	18,811,799	3,510,163	22,321,962
Lung Health Study II	15,027,717	980,040	16,007,757
Lymphangioloeyomyomatosis Registry	392,378	407,346	799,724
Subtotal, Lung Diseases	34,231,894	4,897,549	39,129,443
Blood Diseases and Resources			
Subtotal, Blood Diseases and Resources	0	0	0
National Center for Sleep Disorders Research			
Cardiovascular Consequences of Sleep Apnea	9,731,139	1,698,885	11,430,024
Cardiovascular Effects of Sleep-Related Breathing Disorders	1,835,905	304,400	2,140,305
Cardiovascular Risk in Sleep Apnea—The Framingham Study	1,557,624	378,364	1,935,988
Central Nervous System (CNS) Control of Rhythms and Homeostasis During Spaceflight	619,058	213,909	832,967
Subtotal, National Center for Sleep Disorders Research	13,124,668	2,381,649	15,506,317
Total, NHLBI Cooperative Agreements	\$228,470,072	\$43,460,389	\$268,158,380

Heart and Vascular Diseases Program

Bypass Angioplasty Revascularization Investigation (BARI) Data Coordinating Center, Initiated in 1987

See Chapter 11. Clinical Trials.

Child and Adolescent Trial for Cardiovascular Health (CATCH) III Tracking Study Coordinating Center, Initiated in 1987

See Chapter 11. Clinical Trials.

Depression and Mortality Following Myocardial Infarction, Initiated in 1997

The purpose of this study is to examine altered autonomic tone in depressed acute MI patients as a risk factor for mortality. Primary analysis will determine whether heart rate variability accounts for the significantly higher mortality expected in depressed compared to nondepressed groups, and whether this effect is largely concentrated in patients with ventricular arrhythmias and left ventricular dysfunction. Clinical features of depression that may be associated with high mortality risk and with altered autonomic tone such as symptom severity, comorbid anxiety, or hostility will also be identified.

Obligations

Funding History:

Fiscal Year 1998—\$522,055

Fiscal Year 1997—\$633,379

Total Funding to Date—\$1,155,434

Current Active Organization and Grant Number

1. Washington University
St. Louis, Missouri —HL-58946

Dietary Patterns, Sodium Intake, and Blood Pressure (DASH 2), Initiated in 1997

The purpose of this study is to compare the effects of three levels of dietary sodium and two patterns of diet (a reference diet and an intervention diet high in fruits and vegetable and low in fat) on blood pressure in mildly hypertensive patients. DASH 2 builds on and extends the results of the original NHLBI-initiated DASH study.

Obligations

Funding History:

Fiscal Year 1998—\$3,692,793

Fiscal Year 1997—\$2,233,363

Total Funding to Date—\$5,926,156

Current Active Organizations and Grant Numbers

1. Duke University
Durham, North Carolina —HL-57114
2. The Johns Hopkins University
Baltimore, Maryland —HL-57139
3. Kaiser Foundation Research Institute
Oakland, California —HL-57156
4. Brigham and Women's Hospital
Boston, Massachusetts —HL-57173
5. Pennington Biomedical Research Center
Baton Rouge, Louisiana —HL-57190

Dynamic Evaluation of Percutaneous Coronary Intervention, Initiated in 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 1998—\$627,432

Fiscal Year 1997—\$606,795

Total Funding to Date—\$1,234,227

Current Active Organization and Grant Number

1. University of Pittsburgh
Pittsburgh, Pennsylvania —HL-33292

Early Natural History of Arteriosclerosis, Initiated in 1972

The objectives of this long-term program are to study the impact of genetic factors on the evolution of CVD risk factors in childhood to subsequent subclinical changes (cardiovascular structural and functional characteristics) to ultimately clinical mortality in adulthood and to determine the association of risk factor phenotypes to anatomic changes in the cardiovascular system as seen by necropsy.

Obligations

Funding History:

Fiscal Year 1998—\$1,226,646
Fiscal Year 1997*—\$1,062,791
Total Funding to Date—\$2,289,437

Current Active Organization and Grant Number

1. Tulane University of Louisiana
New Orleans, Louisiana —HL-38844

Estrogen Replacement and Atherosclerosis (ERA) Trial, Initiated in 1994

The purpose of this study is to determine whether estrogen replacement therapy, with or without low-dose progesterone, slows progression or induces regression of coronary atherosclerosis in postmenopausal women.

Obligations

Funding History:

Fiscal Year 1998—\$1,667,501
Fiscal Years 1994-97—\$3,561,854
Total Funding to Date—\$5,229,355

Current Active Organization and Grant Number

1. Wake Forest University
Winston-Salem, North Carolina —HL-49488

Family Heart Study (FHS)—Molecular Genetics and Genetic Epidemiology, Initiated in 1992

The objectives of this study are to identify and characterize genes associated with CHD and atherosclerosis and to examine familial and environmental factors of CHD in order to determine how they interact in the development of clinical outcomes.

Obligations

Funding History:

Fiscal Year 1998—\$1,884,306
Fiscal Years 1992-97—\$3,600,090
Total Funding to Date—\$5,484,396

Current Active Organizations and Grant Numbers

1. University of North Carolina
Chapel Hill, North Carolina —HL-56563
2. University of Minnesota
Minneapolis, Minnesota —HL-56564
3. Boston University Medical Center
Boston, Massachusetts —HL-56565
4. University of Utah
Salt Lake City, Utah —HL-56566
5. Washington University
St. Louis, Missouri —HL-56567
6. University of Minnesota
Minneapolis, Minnesota —HL-56568
7. University of Utah
Salt Lake City, Utah —HL-56569

Genetic Determinants of Hypertension, Initiated in 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. The study consists of collaborative networks that share technology, data, skills, biological materials, and population resources.

Obligations

Funding History:

Fiscal Year 1998—\$2,267,946
Fiscal Years 1995-97—\$4,191,377
Total Funding to Date—\$6,459,323

Current Active Organizations and Grant Numbers

1. University of Hawaii at Manoa
Honolulu, Hawaii —HL-54498
2. Stanford University
Stanford, California —HL-54527

*Became a U01 in 1997.

Glucose Tolerance and Risk for Cardiovascular Disease in the Elderly, Initiated in 1997

The goal of this project is to increase understanding of the longitudinal relationship of cardiovascular risk factors, including diabetes, impaired glucose tolerance, and insulin resistance, to other risk factors, and to stroke and CHD in a cohort of Japanese-American men who have participated in the Honolulu Heart Program for the past 30+ years.

Obligations

Funding History:

Fiscal Year 1998—\$387,021

Fiscal Year 1997—\$379,432

Total Funding to Date—\$766,453

Current Active Organization and Grant Number

1. Kuakini Medical Center
Honolulu, Hawaii —HL-56274

Insulin Resistance and Atherosclerosis Study (IRAS), Initiated in 1991

The objective of this study is to investigate the relationship of insulin and insulin resistance to CVD and CVD risk factors over a range of glucose tolerance in patients with diabetes and in individuals without the disease.

Obligations

Funding History:

Fiscal Year 1998—\$3,099,999

Fiscal Years 1991-97—\$12,640,007

Total Funding to Date—\$15,740,006

Current Active Organizations and Grant Numbers

1. Wake Forest University School of Medicine
Winston-Salem, North Carolina —HL-47887
2. Kaiser Permanente
Oakland, California —HL-47889
3. University of Southern California
Los Angeles, California —HL-47890
4. University of Colorado, Health
Sciences Center
Denver, Colorado —HL-47892
5. University of California
Los Angeles, California —HL-47902
6. University of Texas, Health
Sciences Center
San Antonio, Texas —HL-55208

Mode Selection Trial in Sinus Node Dysfunction (MOST), Initiated in 1995

The purpose of this study is to determine whether dual chamber rate modulated pacing in patients with sick sinus syndrome improves event-free survival, leads to superior quality of life and functional status, and is more cost-effective than single chamber rate modulated pacing.

Obligations

Funding History:

Fiscal Year 1998—\$1,699,487

Fiscal Years 1995-97—\$6,115,664

Funding to Date—\$7,815,151

Current Active Organizations and Grant Numbers

1. Mount Sinai Medical Center
Miami Beach, Florida —HL-49804
2. Duke University
Durham, North Carolina —HL-53973
3. University of California
San Francisco, California —HL-55981

NHLBI Growth and Health Study, Initiated in 1992

The purpose of this study is to examine factors involved in development of obesity and associated CVD risk factors over a 10-year period in a cohort of black and white girls recruited at 9 to 10 years of age. Results will be used to develop effective intervention programs for obesity prevention.

Obligations

Funding History:

Fiscal Year 1998—\$1,766,003

Fiscal Years 1992-97—\$15,181,943

Total Funding to Date—\$16,947,946

Current Active Organizations and Grant Numbers

1. Children's Hospital Medical Center
Cincinnati, Ohio —HL-48941
2. Westat, Inc.
Rockville, Maryland —HL-48942
3. Maryland Medical Research Institute
Baltimore, Maryland —HL-48943
4. University of California
Berkeley, California —HL-48944

Obesity Prevention in American Indians (PATHWAYS), Initiated in 1993

See Chapter 11. Clinical Trials.

Postmenopausal Hormone Replacement Therapy (HRT) After CABG, Initiated in 1996

The objective of this study is to determine whether postmenopausal HRT in women following coronary bypass surgery reduces the occurrence of graft occlusion and delays the development of graft atherosclerosis.

Obligations

Funding History:

Fiscal Year 1998—\$175,432
Fiscal Years 1996-97—\$720,342
Total Funding to Date—\$895,774

Current Active Organization and Grant Number

1. The Johns Hopkins University
Baltimore, Maryland —HL-50840

PREMIER: Lifestyle Interventions for Blood Pressure Control, Initiated in 1998

The objective of this study is to evaluate two multi-component lifestyle interventions to control blood pressure. Participants with either Stage 1 hypertension or high normal blood pressure are assigned to usual care, a comprehensive intervention (reduce salt intake, increase physical activity, moderation of alcohol intake, and weight loss), or the comprehensive intervention plus the "DASH" diet (enhanced fruit and vegetable intake, use of low-fat dairy products, and reductions in saturated fats, total fats, and cholesterol).

Obligations

Funding History:

Fiscal Year 1998—\$2,234,393
Funding to Date—\$2,234,393

Current Active Organizations and Grant Numbers

1. Duke University
Durham, North Carolina —HL-60570
2. Pennington Biomedical Research Center
Baton Rouge, Louisiana —HL-60571
3. Kaiser Foundation Research Institute
Oakland, California —HL-60573
4. The Johns Hopkins University
Baltimore, Maryland —HL-60574
5. Kaiser Foundation Hospitals
Oakland, California —HL-62828

Randomized Evaluation of Mechanical Assistance for the Treatment of Chronic Heart Failure (REMATCH), Initiated in 1997

The objective of this study is to compare the effectiveness of a left ventricular assist device to medical therapy in reducing mortality among patients with heart failure who are not candidates for cardiac transplantation. Rigorous assessment of quality of life and cost-effectiveness of medical versus device therapy are also being conducted.

Obligations

Funding History:

Fiscal Year 1998—\$1,798,390
Fiscal Year 1997—\$1,257,604
Total Funding to Date—\$3,055,994

Current Active Organization and Grant Number

1. Columbia University Health Sciences
New York, New York —HL-53986

Rapid Early Action for Coronary Treatment (REACT), Initiated in 1994

See Chapter 11. Clinical Trials.

Strong Heart Study, Initiated in 1988

The objective of this study is to survey CVD morbidity and mortality rates among three geographically diverse groups of American Indians and to estimate the levels of CVD risk factors. In Phase III, the feasibility of genetic and family studies is being explored.

Obligations

Funding History:

Fiscal Year 1998—\$3,822,330
Fiscal Years 1988-97—\$16,157,494
Funding to Date—\$19,979,824

Current Active Organizations and Grant Numbers

1. Medlantic Research Institute
Washington, D.C. —HL-41642
2. U.S. PHS Aberdeen Area
Indian Health Service
Rapid City, South Dakota —HL-41652
3. University of Oklahoma, Health
Sciences Center
Oklahoma City, Oklahoma —HL-41654

Sudden Cardiac Death in Heart Failure (SCD-HeF), Initiated in 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 1998—\$1,667,152

Fiscal Year 1997—\$1,570,932

Total Funding to Date—\$3,238,084

Current Active Organizations and Grant Numbers

1. Duke University
Durham, North Carolina —HL-55297
2. Duke University
Durham, North Carolina —HL-55496
3. University of Washington
Seattle, Washington —HL-55766

Women's Estrogen/Progestin Lipid-Lowering Hormone Atherosclerosis Regression Trial (WELL-HART), Initiated in 1995

The purpose of this study is to determine the effects of HRT on progression or regression of CHD in postmenopausal women by quantitative angiography.

Obligations

Funding History:

Fiscal Year 1998—\$1,269,545

Fiscal Years 1995-97—\$2,502,536

Total Funding to Date—\$3,772,081

Current Active Organization and Grant Number

1. University of Southern California
Los Angeles, California —HL-49298

Lung Diseases

Collaborative Studies on the Genetics of Asthma (CSGA), Initiated in 1992

The CSGA is a study to identify genes associated with asthma and to elucidate their functional role in development of the disease.

Obligations

Funding History:

Fiscal Year 1998—\$3,510,163

Fiscal Years 1992-97—\$18,811,799

Total Funding to Date—\$22,321,962

Current Active Organizations and Grant Numbers

1. University of Chicago
Chicago, Illinois —HL-49596
2. University of Maryland
Baltimore, Maryland —HL-49602
3. University of Minnesota
Minneapolis, Minnesota —HL-49609
4. The Johns Hopkins University
Baltimore, Maryland —HL-49612
5. Wake Forest University
Winston-Salem, North Carolina —HL-58977

Lung Health Study II, Initiated in 1993

The purpose of this study is to determine whether use of an inhaled corticosteroid can alter the course of lung function decline in patients with mild to moderate COPD.

Obligations

Funding History:

Fiscal Year 1998—\$980,040

Fiscal Years 1993-97—\$15,027,715

Total Funding to Date—\$16,007,757

Current Active Organizations and Grant Numbers

1. University of Minnesota
Minneapolis, Minnesota —HL-50267
2. University of California
Los Angeles, California —HL-50270
3. University of Pittsburgh
Pittsburgh, Pennsylvania —HL-50281
4. Mayo Foundation
Rochester, Minnesota —HL-50283
5. University of Alabama
Birmingham, Alabama —HL-50285
6. The Johns Hopkins University
Baltimore, Maryland —HL-50286
7. Oregon Health Sciences University
Portland, Oregon —HL-50289
8. Case Western Reserve University
Cleveland, Ohio —HL-50292
9. University of Manitoba
Winnipeg, Canada —HL-50297
10. University of Utah
Salt Lake City, Utah —HL-50298
11. Case Western Reserve University,
Henry Ford Health Science Center
Detroit, Michigan —HL-50315

Lymphangiomyomatosis (LAM) Registry, Initiated in 1997

The purpose of this study is to establish a registry of individuals with LAM. The cohort of identified individuals will be used to characterize the clinical features of LAM and provide information on the natural course of the disease. Investigators will examine the clinical features of LAM patients who undergo lung transplantation and assess its efficacy.

Obligations

Funding History:

Fiscal Year 1998—\$407,346

Fiscal Year 1997—\$392,378

Funding to Date—\$799,724

Current Active Organization and Grant Number

1. Cleveland Clinic Foundation
Cleveland, Ohio —HL-58440

National Center for Sleep Disorders Research

Cardiovascular Consequences of Sleep Apnea, Initiated in 1994

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

Obligations

Funding History:

Fiscal Year 1998—\$1,698,885

Fiscal Years 1994-97—\$9,731,139

Total Funding to Date—\$11,430,024

Current Active Organizations and Grant Numbers

1. University of California
Davis, California —HL-53916
2. University of Minnesota
Minneapolis, Minnesota —HL-53934
3. The Johns Hopkins University
Baltimore, Maryland —HL-53937
4. University of Arizona
Tucson, Arizona —HL-53938
5. University of Washington
Seattle, Washington —HL-53940

Cardiovascular Effects of Sleep-Related Breathing Disorders, Initiated in 1994

The purpose of this project is to investigate the relationship between sleep-related breathing disorders and CVD risk, including development of hypertension and left ventricular hypertrophy. Sleep disruption and arousal are being monitored to determine whether severity of sleep-related breathing disorders is a better marker and therefore a better predictor of CVD morbidity than parameters derived from current respiratory monitoring techniques.

Obligations

Funding History:

Fiscal Year 1998—\$304,400

Fiscal Years 1994-97—\$1,834,905

Total Funding to Date—\$2,140,305

Current Active Organization and Grant Number

1. New York University Medical Center
New York, New York —HL-53931

Cardiovascular Risk in Sleep Apnea—The Framingham Study, Initiated in 1994

The purpose of this study is to evaluate the independent contribution of sleep-disordered breathing on CVD risk and to study mechanisms underlying the risk in the well-characterized Framingham Offspring Cohort and in a newly recruited Minority Cohort of the Framingham Study.

Obligations

Funding History:

Fiscal Year 1998—\$378,364

Fiscal Years 1994-1997—\$1,557,624

Total Funding to Date—\$1,935,988

Current Active Organization and Grant Number

1. Boston University
Boston, Massachusetts —HL-53941

Central Nervous System (CNS) Control of Rhythms and Homeostasis During Spaceflight, Initiated in 1995

The objective of this study is to compare data on physiology of the circadian time system and homeostatic control systems in rats exposed to spaceflight to data obtained from control rats that remained on Earth.

Obligations

Funding History:

Fiscal Year 1998—\$213,909

Fiscal Years 1995-97—\$619,058

Total Funding to Date—\$832,967

Current Active Organization and Grant Number

1. University of California
Davis, California

—HL-53205

NHLBI Research Centers (P50 and P60) Programs

Specialized Centers of Research (P50) Program

Specialized Centers of Research (SCOR) were instituted to advance basic knowledge and to generate the most effective techniques and methods of clinical management and prevention in the areas of arteriosclerosis, hypertension, pulmonary diseases, and thrombosis. Currently, the SCOR Program focuses on 16 active areas of heart, blood vessel, lung, blood, and sleep research.

NHLBI Specialized Centers of Research (P50)

Areas of Concentration	Period of Operation	Obligations (Dollars in Thousands)		
		Prior to FY 1998*	FY 1998	Total to Date*
Heart and Vascular Diseases Program				
Gene Transfer Principles for Heart, Lung, and Blood Diseases	1997-	\$5,165	\$5,217	\$10,382
Ischemic Heart Disease in Blacks	1995-	7,016	2,619	9,635
Ischemic Heart Disease, Sudden Cardiac Death, Heart Failure	1995-	39,753	14,535	54,288
Molecular Genetics of Hypertension	1996-	16,799	8,851	25,650
Molecular Medicine and Atherosclerosis	1997-	6,363	6,949	13,312
Pediatric Cardiovascular Disease	1993-	12,585	3,859	16,444
Subtotal, Heart and Vascular Diseases Program		87,681	42,030	129,711
Lung Diseases Program				
Acute Lung Injury	1994-	27,274	9,900	37,174
Airway Biology and Pathogenesis of Cystic Fibrosis	1988-	25,140	5,099	30,239
Cellular and Molecular Mechanisms of Asthma	1996-	14,684	10,216	24,900
Pathobiology of Fibrotic Lung Disease	1997-	4,504	4,625	9,129
Pathobiology of Lung Development	1996-	9,972	7,306	17,278
Subtotal, Lung Diseases Program		81,574	37,146	118,720
Blood Diseases and Resources Program				
Hematopoietic Stem Cell Biology	1995-	11,200	3,522	14,722
Thrombosis	1971-	127,465	4,197	131,662
Transfusion Medicine	1985-	35,726	4,305	40,031
Subtotal, Blood Diseases and Resources Program		174,391	12,024	186,415
National Center for Sleep Disorders Research				
Neurobiology of Sleep and Sleep Apnea	1988-	—	4,267	4,267
Subtotal, National Center for Sleep Disorders Research		—	4,267	4,267
Total, Specialized Centers of Research (P50)		\$343,646	\$95,467	\$439,113

Specialized Centers of Research (P50) Program

Heart and Vascular Diseases Program

Gene Transfer Principles for Heart, Lung, and Blood Diseases

The purpose of this SCOR is to provide the basic science foundation necessary for gene transfer technology and its application to somatic gene transfer.

Obligations

Fiscal Year 1998—\$5,217,163

Current Active Organizations and Grant Numbers

- | | |
|-------------------------------------------------------------|-----------|
| 1. Cornell University Medical College
New York, New York | —HL-59312 |
| 2. Baylor College of Medicine
Houston, Texas | —HL-59314 |
| 3. Brigham and Women's Hospital
Boston, Massachusetts | —HL-59316 |
| 4. University of Florida
Gainesville, Florida | —HL-59412 |

Ischemic Heart Disease in Blacks

The purpose of this SCOR is to promote an interdisciplinary study of issues surrounding the expression of heart disease in blacks.

Obligations

Fiscal Year 1998—\$2,619,918

Current Active Organizations and Grant Numbers

- | | |
|---------------------------------------------------------------------|-----------|
| 1. University of Texas Southwest
Medical Center
Dallas, Texas | —HL-55988 |
| 2. Boston University
Boston, Massachusetts | —HL-55993 |

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 1998—\$14,535,040

Current Active Organizations and Grant Numbers

- | | |
|----------------------------------------------------------------------------------|-----------|
| 1. The Johns Hopkins University
Baltimore, Maryland | —HL-52307 |
| 2. The Johns Hopkins University
Baltimore, Maryland | —HL-52315 |
| 3. University of Cincinnati
Cincinnati, Ohio | —HL-52318 |
| 4. University of California
Los Angeles, California | —HL-52319 |
| 5. Brigham and Women's Hospital
Boston, Massachusetts | —HL-52320 |
| 6. Indiana University-Purdue
University Indianapolis
Indianapolis, Indiana | —HL-52323 |
| 7. University of Utah
Salt Lake City, Utah | —HL-52338 |
| 8. University of California
San Diego, California | —HL-53773 |
| 9. Baylor College of Medicine
Houston, Texas | —HL-54313 |
| 10. Duke University
Durham, North Carolina | —HL-54314 |

Molecular Genetics of Hypertension

The goals of this SCOR 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 1998—\$8,850,796

Current Active Organizations and Grant Numbers

1. Medical College of Wisconsin
Milwaukee, Wisconsin —HL-54998
2. Brigham and Women's Hospital
Boston, Massachusetts —HL-55000
3. Boston University Medical Center
Boston, Massachusetts —HL-55001
4. University of Southern California
Los Angeles, California —HL-55005
5. University of Iowa Hospitals
Iowa City, Iowa —HL-55006
6. Yale University School of Medicine
New Haven, Connecticut —HL-55007

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.

Obligations

Fiscal Year 1998—\$6,948,762

Current Active Organizations and Grant Numbers

1. Columbia University
New York, New York —HL-56984
2. Brigham and Women's Hospital
Boston, Massachusetts —HL-56985
3. Cornell University Medical College
New York, New York —HL-56987
4. University of California
San Diego, California —HL-56989
5. Beth Israel Deaconess Medical Center
Boston, Massachusetts —HL-56993

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

Obligations

Fiscal Year 1998—\$3,858,585

Current Active Organizations and Grant Numbers

1. University of Rochester
Rochester, New York —HL-51498
2. Children's Hospital of Philadelphia
Philadelphia, Pennsylvania —HL-51533
3. University of Iowa
Iowa City, Iowa —HL-42266

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 1998—\$9,899,625

Current Active Organizations and Grant Numbers

1. Vanderbilt University
Nashville, Tennessee —HL-19153
2. University of California, San Diego
La Jolla, California —HL-23584
3. University of Washington
Seattle, Washington —HL-30542
4. University of Colorado Health
Sciences Center
Denver, Colorado —HL-40784
5. University of Minnesota
Minneapolis, Minnesota —HL-50152
6. University of Utah
Salt Lake City, Utah —HL-50153
7. University of Pennsylvania
Philadelphia, Pennsylvania —HL-60290
8. University of Iowa
Iowa City, Iowa —HL-60316

Airways 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 1998—\$5,098,736

Current Active Organizations and Grant Numbers

1. University of North Carolina
Chapel Hill, North Carolina —HL-60280
2. University of California
San Francisco, California —HL-60288
3. Case Western Reserve University
Cleveland, Ohio —HL-60293
4. University of Iowa
Iowa City, Iowa —HL-61234

Cellular and Molecular Mechanisms of Asthma

The objective of this 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 1998—\$10,216,254

Current Active Organizations and Grant Numbers

1. Brigham and Women's Hospital
Boston, Massachusetts —HL-56383
2. University of Chicago
Chicago, Illinois —HL-56399
3. Washington University
St. Louis, Missouri —HL-56419
4. University of California
San Francisco, California —HL-56385
5. University of New Mexico
Albuquerque, New Mexico —HL-56384
6. Yale University
New Haven, Connecticut —HL-56389
7. University of Wisconsin
Madison, Wisconsin —HL-56396

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 1998—\$4,625,215

Current Active Organizations and Grant Numbers

1. Boston University
Boston, Massachusetts —HL-56386
2. University of Michigan
Ann Arbor, Michigan —HL-56402
3. National Jewish Center for
Immunology and Respiratory Diseases
Denver, Colorado —HL-56556

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 1998—\$7,305,660

Current Active Organizations and Grant Numbers

1. Children's Hospital Medical Center
Cincinnati, Ohio —HL-56387
2. University of North Carolina
Chapel Hill, North Carolina —HL-56395
3. Children's Hospital of Boston
Boston, Massachusetts —HL-56398
4. Children's Hospital of Philadelphia
Philadelphia, Pennsylvania —HL-56401
5. University of Colorado Health
Science Center
Denver, Colorado —HL-57144

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 1998—\$3,521,518

Current Active Organizations and Grant Numbers

1. Children's Hospital
Boston, Massachusetts —HL-54785
2. Children's Hospital
Los Angeles, California —HL-54850
3. Fred Hutchinson Cancer Research
Center
Seattle, Washington —HL-54881

Thrombosis

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.

Obligations

Fiscal Year 1998—\$4,197,867

Current Active Organizations and Grant Numbers

1. Mt. Sinai School of Medicine
New York, New York —HL-54469
2. University of Pennsylvania
Philadelphia, Pennsylvania —HL-54500
3. University of Oklahoma
Oklahoma City, Oklahoma —HL-54502

Transfusion 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.

Obligations

Fiscal Year 1998—\$4,304,816

Current Active Organizations and Grant Numbers

1. New York Blood Center
New York, New York —HL-54459
2. University of California, San Francisco
San Francisco, California —HL-54476
3. University of Pennsylvania
Philadelphia, Pennsylvania —HL-54516

Sleep Disorders Program

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 1998—\$4,267,277

Current Active Organizations and Grant Numbers

1. University of Pennsylvania
Philadelphia, Pennsylvania —HL-60287
2. University of Wisconsin
Madison, Wisconsin —HL-60291
3. Brigham and Women's Hospital
Boston, Massachusetts —HL-60292
4. University of California
Los Angeles, California —HL-60296

Comprehensive Sickle Cell Centers (P60) 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.

Obligations

Fiscal Year 1998—\$17,430,183

Current Active Organizations and Grant Numbers

- | | | | |
|---------------------------------------------------------------------------------------|-----------|-----------------------------------------------------------------|-----------|
| 1. Boston Medical Center
Boston, Massachusetts | —HL-15157 | 6. Montefiore Medical Center
New York, New York | —HL-38655 |
| 2. University of California
San Francisco, California | —HL-20985 | 7. University of Southern California
Los Angeles, California | —HL-48484 |
| 3. College of Physicians and
Surgeons of Columbia University
New York, New York | —HL-28381 | 8. University of Alabama
Birmingham, Alabama | —HL-58418 |
| 4. Children's Hospital of Philadelphia
Philadelphia, Pennsylvania | —HL-38632 | 9. Children's Hospital Medical Center
Cincinnati, Ohio | —HL-58421 |
| 5. University of South Alabama
Mobile, Alabama | —HL-38639 | 10. Thomas Jefferson University
Philadelphia, Pennsylvania | —HL-62148 |

Center for AIDS Research (P30) Program

The NHLBI, along with five other NIH Institutes, contributes to the support of six Centers for AIDS Research (CFAR) 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.

Obligations

Fiscal Year 1998—\$1,500,000

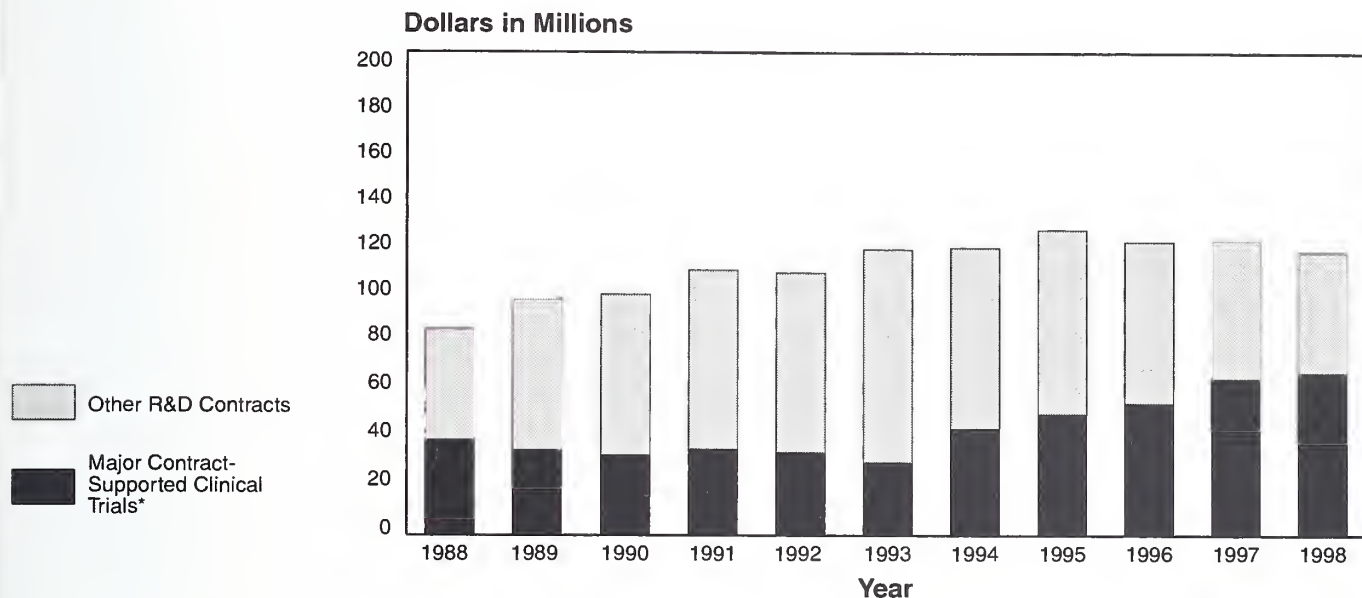
Current Active Organizations and Grant Numbers

- | | | | |
|--------------------------------------------------------|-----------|-------------------------------------------------------|-----------|
| 1. University of Washington
Seattle, Washington | —AI-27757 | 4. University of California
San Diego, California | —AI-36214 |
| 2. University of Alabama
Birmingham, Alabama | —AI-27767 | 5. Case Western Reserve University
Cleveland, Ohio | —AI-36219 |
| 3. University of California
Los Angeles, California | —AI-28697 | 6. Miriam Hospital
Providence, Rhode Island | —AI-42853 |



10. Research and Development Contracts

NHLBI Research and Development Contract Obligations*: Fiscal Years 1988-98



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

NHLBI Total Research and Development Contract Obligations: Fiscal Years 1988-98

(Dollars in Thousands)

	Fiscal Year										
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Heart	\$61,342	\$63,944	\$62,177	\$61,070	\$57,714	\$66,717	\$67,173	\$70,178	\$80,373	\$84,820	\$77,886
Lung	6,122	9,169	10,338	16,910	16,977	18,552	21,957	15,414	21,032	18,183	13,123
Blood	16,408	23,607	25,862	30,725	32,980	32,280	29,122	40,324	19,522	18,934	25,695
Total	\$83,872	\$96,720	\$98,377	\$108,705	\$107,671	\$117,549	\$118,252	\$125,916	\$120,927*	\$121,937†	\$116,704‡

* Includes Program Evaluation Assessment of \$4,250,000.

† Includes Program Evaluation and IMPAC II Assessments of \$8,986,000.

‡ Includes Program Evaluation and IMPAC II Assessments of \$12,589,000.

Major NHLBI Research and Development Contracts by Program*: Fiscal Year 1998

	Total Obligations Prior to FY 1998	Total FY 1998 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Atherosclerosis Risk in Communities (ARIC)	\$96,591,485	\$5,515,696	\$102,107,181
Cardiovascular Health Study (CHS)	57,699,194	796,000	58,495,194
Circulatory Assist/Artificial Heart Program	83,401,292	3,460,000	86,861,292
Coronary Artery Risk Development in Young Adults (CARDIA)	42,506,882	2,458,292	44,965,174
Framingham Study	22,410,997	4,850,175	27,261,173
Innovative Ventricular Assist System (IVAS)	21,516,059	1,014,000	22,530,059
Jackson Heart Study (JHS)	0	16,000	16,000
Mammalian Genotyping Service (MGS)	5,207,750	0	5,207,750
Lung Diseases			
A Case-Controlled Etiologic Study of Sarcoidosis (ACCESS)	6,262,284	2,232,000	8,494,284
Interventions to Improve Asthma Management and Prevention at School	4,180,325	1,271,000	5,451,325
Pediatric Pulmonary and Cardiac Complications of HIV Infection (P2C2)	37,736,370	1,978,557	39,714,927
Blood Diseases and Resources			
Refinement of New Assays for Direct Detection of Viral Nucleic Acids in Donated Organs	8,607,313	3,951,044	12,558,357
Retrovirus Epidemiology Donor Study (REDS)	41,313,061	2,094,000	43,407,061

* Excludes clinical trials included in Chapter 11.

Heart and Vascular Diseases Program

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

ARIC is a large-scale, long-term program that is measuring associations of established and suspected CHD risk factors with both atherosclerosis and new CHD events in men and women from four diverse communities. The project has two components: community surveillance and repeated examinations of a representative cohort of men and women in each community.

Obligations

Funding History:

Fiscal Year 1998—\$5,515,696

Fiscal Years 1985-97—\$96,591,485

Total Funding to Date—\$102,107,181

Current Active Organizations and Contract Numbers

1. University of North Carolina
Chapel Hill, North Carolina —HC-55015

2. Baylor College of Medicine
Houston, Texas —HC-55016
3. University of North Carolina
Chapel Hill, North Carolina —HC-55018
4. University of Minnesota
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 major objective of this research is to investigate risk factors for CHD and stroke in the elderly. The study will determine whether the presence or progression of subclinical disease, detected noninvasively, is a better predictor of clinical disease than traditional risk factors. In addition, characteristics of subgroups at low risk for developing CVD will be identified because preventive measures may be unnecessary for such groups.

* Formerly called "Coronary Heart Disease and Stroke in the Elderly Program."

Obligations

Funding History:

Fiscal Year 1998—\$796,000

Fiscal Years 1988-97—\$57,699,194

Total Funding to Date—\$58,495,194

Current Active Organizations and Contract Numbers

1. University of Washington
Seattle, Washington —HC-85079
2. Bowman Gray School of Medicine
Wake Forest University
Winston-Salem, North Carolina —HC-85080
3. The Johns Hopkins University
Baltimore, Maryland —HC-85081
4. University of California
Davis, California —HC-85083
5. University of Vermont
Burlington, Vermont —HC-85086
6. The Johns Hopkins University
Baltimore, Maryland —HC-15103
7. Geisinger Medical Center
Danville, Pennsylvania —HC-45133
8. Georgetown University
Washington, D.C. —HC-35129
9. University of Wisconsin
Madison, Wisconsin —HC-75150
10. University of Pittsburgh
Pittsburgh, Pennsylvania —HC-85082

Circulatory Assist/Artificial Heart Program

This program focuses on electrical-mechanical, fully implantable circulatory support systems: ventricular assist devices and the total artificial heart. The basic research underlying this program is supported by research grants. Device development and clinical testing of devices are supported by contract.

Obligations

Funding History:

Fiscal Year 1998—\$3,460,000

Fiscal Years 1984-97—\$83,401,292

Total Funding to Date—\$86,861,292

Current Active Organizations and Contract Numbers

Biventricular Assist and Replacement Devices, Initiated in Fiscal Year 1988:

1. Cleveland Clinic Foundation
Cleveland, Ohio —HV-38128
2. Pennsylvania State University
Hershey, Pennsylvania —HV-38130

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

The major objective of this study is to describe and identify factors associated with the development of cardiovascular risk factors and early atherosclerosis in a cohort of black and white young adults. The fifth (Year 10) examination was completed in 1996, and a Year 15 examination, which will include a measure of subclinical atherosclerosis, is planned for 2000.

Obligations

Funding History:

Fiscal Year 1998—\$2,458,292

Fiscal Years 1984-97—\$42,506,882

Total Funding to Date—\$44,965,174

Current Active Organizations and Contract Numbers

1. University of California at Irvine
Irvine, California —HC-45134
2. University of Alabama at Birmingham
Birmingham, Alabama —HC-48047
3. University of Minnesota
Minneapolis, Minnesota —HC-48048
4. Northwestern University
Chicago, Illinois —HC-48049
5. Kaiser Permanente Division of Research
Oakland, California —HC-48050
6. University of Alabama at Birmingham
Birmingham, Alabama —HC-95095

Framingham Study

The Framingham Study is a longitudinal investigation of constitutional, environmental, and genetic factors influencing the development of CVD in men and women free of those conditions at the outset. In addition to the cohort of 5,209 men and women originally enrolled in the study, a second sample of nearly equal size consisting of offspring (and their spouses) was established in the 1970s. The offspring cohort permits the examination of numerous hypotheses about the familial clustering of CVD and CVD risk factors.

Obligations

Funding History:

Fiscal Year 1998—\$4,850,175

Fiscal Years 1983-97—\$22,410,997

Total Funding to Date—\$27,261,173

Current Active Organization and Contract Number

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

Innovative Ventricular Assist System (IVAS), Initiated in Fiscal Year 1995

The major objective of this research is to encourage the development of totally implantable ventricular assist systems that are designed to achieve at least a 5-year life-time with 90 percent reliability.

Obligations

Funding History:

Fiscal Year 1998—\$1,014,000

Fiscal Years 1995-97—\$21,516,059

Total Funding to Date—\$22,530,059

Current Active Organizations and Contract Numbers

1. Abiomed, Inc.
Danvers, Massachusetts —HV-58154
2. Nimbus, Inc.
Rancho Cordova, California —HV-58155
3. Pennsylvania State University
University Park, Pennsylvania —HV-58156
4. Transcoil, Inc.
Trooper, Pennsylvania —HV-58157
5. Whalen Biomedical, Inc.
Cambridge, Massachusetts —HV-58158
6. Cleveland Clinic Foundation
Cleveland, Ohio —HV-58159

Jackson Heart Study (JHS), Initiated in Fiscal Year 1998

A single-site epidemiologic study of CVD in blacks, similar to those previously established in Framingham, MA, and Honolulu, HI, with primary goals of (1) identifying risk factors for development and progression of CVD; (2) enhancing recruitment, cohort retention, and scientific productivity of the existing Jackson site of the ARIC study; (3) 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 1998—\$16,000*

Total Funding to Date—\$16,000

Current Active Organization and Contract Number

1. Mississippi Medical Center
Jackson, Mississippi —HC-55021

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

The NHLBI Mammalian Genotyping Service provides genotyping to meritorious projects involving humans, mice, and rats in all disease areas. This service 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 4 million genotypes per year.

Obligations

Funding History:

Fiscal Year 1998—\$0

Fiscal Years 1994-97—\$5,207,750

Total Funding to Date—\$5,207,750

Current Active Organization and Contract Number

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

Lung Diseases Program

A Case-Controlled Etiologic Study of Sarcoidosis (ACCESS), Initiated in Fiscal Year 1995

The major objectives of this program are to support a multicenter case-control study of potential etiologic factors for sarcoidosis, a systemic granulomatous disease that usually produces disease in the lung. The study will assess the role of environmental and familial factors in the etiology of the disease. The protocol will include comprehensive clinical characterization and examination of markers of immune responsiveness as well as banking of blood, bronchoalveolar lavage fluid, and tissue for further studies.

Obligations

Funding History:

Fiscal Year 1998—\$2,232,000

Fiscal Years 1995-97—\$6,262,284

Total Funding to Date—\$8,494,284

*Additional funding is provided by the NIH Office of Research on Minority Health (ORMH).

Current Active Organizations and Contract Numbers

1. The Johns Hopkins University
Baltimore, Maryland —HR-56065
2. National Jewish Center for Immunology
and Respiratory Medicine
Denver, Colorado —HR-56066
3. Case Western Reserve University
Henry Ford Hospital
Detroit, Michigan —HR-56067
4. Medical University of South Carolina
Charleston, South Carolina —HR-56068
5. University of Cincinnati Medical Center
Cincinnati, Ohio —HR-56069
6. University of Iowa
Iowa City, Iowa —HR-56070
7. Mt. Sinai School of Medicine
New York, New York —HR-56071
8. University of Pennsylvania
Philadelphia, Pennsylvania —HR-56072
9. Georgetown University
Washington, D.C. —HR-56073
10. Beth Israel Hospital
Boston, Massachusetts —HR-56074
11. Clinical Trials and Surveys Corporation
Baltimore, Maryland —HR-56075

Interventions to Improve Asthma Management and Prevention at School, Initiated in Fiscal Year 1995

This is a program to develop and evaluate innovative programs to ensure optimal asthma management and prevention at school. Program objectives include identifying cost-effective measures to increase identification and appropriate referral of children with uncontrolled asthma; reducing children's exposure to known allergens and irritants; increasing participation of students with asthma in all school activities; improving support to the students for following their asthma management plans; and improving communication between the school and home.

Obligations

Funding History:

Fiscal Year 1998—\$1,271,000

Fiscal Years 1995-97—\$4,180,325

Total Funding to Date—\$5,451,325

Current Active Organizations and Contract Numbers

1. University of Alabama
Birmingham, Alabama —HR-56077
2. University of Michigan at Ann Arbor
Ann Arbor, Michigan —HR-56078
3. University of Texas Health Science
Center at Houston
Houston, Texas —HR-56079

Pediatric Pulmonary and Cardiac Complications of HIV Infection (P2C2), Initiated in Fiscal Year 1989

This multicenter natural history study is designed to identify and follow the course of lung and cardiovascular diseases that occur in pediatric patients with all stages of vertically transmitted HIV infection.

Obligations

Funding History:

Fiscal Year 1998—\$1,978,557

Fiscal Years 1989-97—\$37,736,370

Total Funding to Date—\$39,714,927

Current Active Organizations and Contract Numbers

1. Cleveland Clinic Foundation
Cleveland, Ohio —HR-96037
2. University of California, Los Angeles
Los Angeles, California —HR-96038
3. Baylor College of Medicine
Houston, Texas —HR-96040
4. Children's Hospital Corporation
Boston, Massachusetts —HR-96041
5. Mt. Sinai School of Medicine
New York, New York —HR-96042
6. Presbyterian Hospital
New York, New York —HR-96043

Blood Diseases and Resources Program

Refinement of New Assays for Direct Detection of Viral Nucleic Acids in Donated Blood, Initiated in Fiscal Year 1996

This program will refine, for use in clinical laboratories, one or more nucleic acid-based techniques for the direct detection of blood-borne viruses (HIV and hepatitis C are the highest priority) in donors of blood for transfusion. The purpose of the new technique is to reduce the antibody-negative window between infectivity and detection to the shortest possible time.

Obligations

Funding History:

Fiscal Year 1998—\$3,951,044

Fiscal Years 1996-97—\$8,607,313

Total Funding to Date—\$12,558,357

Current Active Organization and Contract Number

1. Gen-Probe, Inc.
San Diego, California —HB-67130

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

This program was established to determine the prevalence of retrovirus-positivity in blood donors. 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 1998—\$2,094,000
- Fiscal Years 1989-97—\$41,313,061
- Total Funding to Date—\$43,407,061

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
Rockville, Maryland —HB-97082



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 1988-98

Research Grants and Cooperative Agreements (Dollars in Thousands)

	Fiscal Year										
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Heart and Vascular Diseases											
Program on Surgical Control of Hyperlipidemias (POSCH)	\$3,175	\$2,394	\$1,902	\$1,584	\$—	\$485	\$500	\$538	\$566	\$294	\$—
Exercise Training and Plasma Lipoproteins in Man	808	621	—	—	—	—	—	—	—	—	—
Physicians' Health Study	613	655	645	555	—	—	—	—	—	—	—
Stanford Coronary Risk Intervention Program (SCRIP)	1,405	1,485	1,410	354	382	—	—	—	—	—	—
Continuation of Trial of Antihypertensive Intervention Management (COTAIM)	2,208	1,914	1,780	614	—	—	—	—	—	—	—
Randomized Trial of Diets in Obese Hypertensives	290	—	—	—	—	—	—	—	—	—	—
Polyunsaturates and KCL to Control Mild Hypertension	—	266	272	328	—	—	—	—	—	—	—
Boston Area Anticoagulation Trial for Atrial Fibrillation	522	495	479	370	—	—	—	—	—	—	—
Electrophysiologic Study vs. Electrocardiographic Monitoring (ESVEM)	—	959	794	904	740	—	—	—	—	—	—
Prevention of Coronary Aneurysm in Kawasaki Syndrome	1,654	822	—	—	—	—	—	—	—	—	—
Sodium-Potassium Blood Pressure Trial in Children	586	563	206	205	—	—	—	—	—	—	—
Treatment of Mild Hypertension Study (TOMHS)	2,499	—	1,931	962	—	—	—	—	—	—	—
Optimal Exercise Regimens for Persons at Increased Risk	528	520	—	—	—	—	—	—	—	—	—
Myocarditis Treatment Trial	—	1,591	—	247	—	—	—	—	—	—	—
Diuretics, Hypertension, and Arrhythmias Clinical Trial	341	41	127	—	—	—	—	—	—	—	—
Recurrent Carotid Stenosis	182	186	120	—	—	—	—	—	—	—	—
Coronary Artery Surgery Study Follow-up	532	—	—	644	670	—	—	—	—	—	—
Training Levels Comparison Trial	413	395	339	245	—	—	—	—	—	—	—
Controlled Trial to Reverse Coronary Atherosclerosis	387	438	459	180	—	—	—	—	—	—	—
Cardiac Arrest in Seattle: Conventional vs. Amiodarone Drug Evaluation (CASCADE)	601	627	664	668	—	—	—	—	—	—	—
Emory Angioplasty Versus Surgery Trial (EAST)	1,553	1,430	1,877	1,951	—	277	288	296	296	—	—
Asymptomatic Carotid Artery Plaque Study (ACAPS)	1,164	1,170	843	901	1,255	—	—	66	70	—	—
Myocardial Infarction Triage and Intervention Project (MITI)	730	643	624	539	—	—	—	—	—	—	—

NHLBI Investigator-Initiated Clinical Trials: Fiscal Year 1988-98 (continued)

Research Grants and Cooperative Agreements (Dollars in Thousands)

	1988	1989	1990	1991	1992	Fiscal Year					
						1993	1994	1995	1996	1997	1998
Heart and Vascular Diseases (continued)											
Infant Heart Surgery: Central Nervous System Sequelae of Circulatory Arrest	—	588	623	720	770	756	516	598	699	685	582
Lifestyle Heart Trial	—	515	530	604	524	—	—	—	—	—	—
Thrombolysis in Myocardial Ischemia (T3)	—	4,029	1,957	4,011	636	—	—	—	—	—	—
Do Fish Oils Prevent Restenosis Postcoronary Angioplasty?*	—	1,069	1,352	1,452	750	—	—	—	—	—	—
Prevention of Early Readmission in Elderly Congestive Heart Failure Patients	—	—	90	106	108	112	77	—	—	—	—
MRFIT Follow-up and Analysis	—	—	350	358	387	402	418	—	—	—	—
Multicenter Unsustained Tachycardia Trial (MUSTT)*	—	—	—	2,029	2,072	2,092	2,095	1,958	504	—	—
Trial of Vitamin E and Aspirin in Nurses	—	—	—	2,990	1,170	1,393	1,488	1,426	1,434	1,473	1,536
Diet and Exercise for Elevated Risk (DEER)	—	—	—	717	775	805	703	—	—	—	—
Cardiovascular Risk Factors and Menopause	—	—	—	—	539	610	601	451	478	494	528
Sodium Sensitivity in African Americans	—	—	—	—	686	492	97	249	—	—	—
Montreal Heart Attack Readjustment Trial (M-HART)	—	—	—	—	271	298	340	—	—	—	—
Stress Reduction in Elderly Blacks With Hypertension	—	—	—	—	296	321	338	321	—	—	—
Trial of Nonpharmacologic Intervention in the Elderly (TONE)	—	—	—	—	749	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
Oral Calcium in Pregnant Women With Hypertension	—	—	—	—	—	280	290	306	320	332	—
Stress Reduction and Hypertensive Heart Disease in Blacks	—	—	—	—	—	—	219	330	403	407	40
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
Early Revascularization for Cardiogenic Shock	—	—	—	—	—	—	1,070	1,022	1,008	826	874
Does Atherosclerosis Regress With Therapy for Low HDLC?	—	—	—	—	—	—	484	480	427	445	340
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
Mode Selection Trial in Sinus Node Dysfunction (MOST)*	—	—	—	—	—	—	—	2,163	1,857	2,096	1,700
Antioxidants and Prevention of Early Atherosclerosis*	—	—	—	—	—	—	—	793	240	603	—
Postmenopausal Hormone Therapy in Unstable Angina	—	—	—	—	—	—	—	253	258	264	271

* Paid by U01/U10

NHLBI Investigator-Initiated Clinical Trials: Fiscal Years 1988-98 (continued)

Research Grants and Cooperative Agreements (Dollars in Thousands)

	Fiscal Year										
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Heart and Vascular Diseases (continued)											
Estrogen and Graft Atherosclerosis Research Trial*	—	—	—	—	—	—	—	—	476	244	305
Soy Estrogen Alternative Study (SEA)	—	—	—	—	—	—	—	—	219	217	221
REMATCH Trial*	—	—	—	—	—	—	—	—	—	1,258	1,798
Dietary Patterns, Sodium Intake, and Blood Pressure (DASH 2)*†	—	—	—	—	—	—	—	—	—	2,233	3,693
Sudden Cardiac Death in Heart Failure Trial (SCD-HeFT)*	—	—	—	—	—	—	—	—	—	1,571	1,667
CVD Risk and Health in Postmenopausal Phytoestrogen Users	—	—	—	—	—	—	—	—	—	631	662
Prevention of Recurrent Venous Thromboembolism (PREVENT)	—	—	—	—	—	—	—	—	—	—	1,242
PREMIER: Lifestyle Interventions for Blood Pressure Control*	—	—	—	—	—	—	—	—	—	—	2,234
Azithromycin and Coronary Artery Disease *	—	—	—	—	—	—	—	—	—	—	847
Subtotal, Heart and Vascular Diseases	20,191	23,416	19,374	24,238	12,780	13,309	16,098	15,987	13,673	18,880	22,791
Lung Diseases											
Human Surfactant Treatment of Respiratory Distress Syndrome	242	270	—	—	—	—	—	—	—	—	—
Trial of Inspiratory Muscle Rest and Exercise in Chronic Obstructive Lung Disease	159	34	—	—	—	—	—	—	—	—	—
Extracorporeal Carbon Dioxide Removal for Adult Respiratory Distress Syndrome	359	237	—	—	—	—	—	—	—	—	—
Emphysema: Physiologic Effects of Nutritional Support	—	—	215	224	230	246	155	—	—	—	—
Cardiopulmonary Effects of Ibuprofen in Human Sepsis*	—	—	799	725	792	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
Subtotal, Lung Diseases	760	541	1,014	949	1,022	2,309	4,835	5,172	3,734	3,944	980
Blood Diseases and Resources											
Erythropoietin for Anemia Due to Zidovudine in Human Immunodeficiency Virus Infection	240	251	229	—	—	—	—	—	—	—	—
Multicenter Study of Hydroxyurea in Patients With Sickle Cell Anemia - Phase II*	—	—	—	1,999	3,139	3,221	3,271	1,238	—	—	—
Chelation Therapy of Iron Overload With Pyridoxal Isonicotinoyl Hydrazone (PIH)	—	202	203	211	220	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
Pediatric Hydroxyurea in Sickle Cell Anemia (PED HUG)	—	—	—	—	—	—	146	250	260	270	—
Subtotal, Blood Diseases and Resources	240	453	432	2,210	3,359	3,439	8,678	5,991	2,958	2,854	2,036
Total, NHLBI	\$21,191	\$24,410	\$20,820	\$27,397	\$17,161	\$19,057	\$29,611	\$27,150	\$20,365	\$25,678	\$25,807

* Paid by U01/U10.

† Previously an Institute-Initiated Clinical Trial.

NHLBI Investigator-Initiated Clinical Trials, Fiscal Year 1998: Summary by Program

	Total Obligations Prior to FY 1998	Total FY 1998 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Antioxidants and Prevention of Early Atherosclerosis*	\$1,635,798	\$ 0	\$1,635,798
Azithromycin and Coronary Artery Disease*	0	847,117	847,117
CABG Patch Trial *	9,982,013	0	9,982,013
Cardiovascular Risk Factors and the Menopause	3,172,010	528,252	3,700,262
CVD Risk and Health in Postmenopausal Phytoestrogen Users	630,472	662,193	1,292,665
Dietary Patterns, Sodium Intake and Blood Pressure (DASH 2)*†	2,233,363	3,692,793	5,926,156
Does Atherosclerosis Regress with Therapy for Low HDLC?	1,835,899	340,298	2,176,197
Early Revascularization for Cardiogenic Shock	3,925,020	873,743	4,798,763
Enalapril After Anthracycline Cardiotoxicity	2,665,513	788,640	3,454,153
Estrogen and Graft Atherosclerosis Research Trial*	720,342	305,432	1,025,774
Estrogen Replacement and Atherosclerosis (ERA) Trial*	3,561,854	1,667,501	5,229,355
Infant Heart Surgery: Central Nervous System Sequelae of Circulatory Arrest	5,954,417	581,698	6,536,115
Mode Selection Trial in Sinus Node Dysfunction (MOST)*	6,115,664	1,699,487	7,815,151
Oral Calcium in Pregnant Women with Hypertension	1,527,781	0	1,527,781
Postmenopausal Hormone Therapy in Unstable Angina	774,664	270,704	1,045,368
PREMIER: Lifestyle Interventions for Blood Pressure Control*	0	2,234,393	2,234,393
Prevention of Recurrent Venous Thromboembolism (PREVENT)	0	1,241,607	1,241,607
REMATCH Trial*	1,257,604	1,798,390	3,055,994
Soy Estrogen Alternative Study (SEA)	436,254	221,125	657,379
Stress and Anger Management for Blacks with Hypertension	944,217	0	944,217
Stress Reduction and Hypertensive Heart Disease in Blacks	1,359,184	40,000	1,399,184
Sudden Cardiac Death in Heart Failure Trial (SCD-HeFT)*	1,570,932	1,667,152	3,238,084
Trial of Vitamin E and Aspirin in Women	11,374,446	1,536,000	12,910,446
Women's Antioxidant and Cardiovascular Study (WACS)	2,961,392	525,013	3,486,405
Women's Estrogen/Progestin Lipid-Lowering Hormone Atherosclerosis Regression Trial (WELL-HART)*	2,502,536	1,269,345	3,771,881
Subtotal, Heart and Vascular Diseases	67,141,375	22,790,883	89,932,258
Lung Diseases			
Inhaled Beclomethasone to Prevent Chronic Lung Disease*	2,997,678	0	2,997,678
Lung Health Study II*†	15,027,715	980,040	16,007,755
Subtotal, Lung Diseases	18,025,393	980,040	19,005,433
Blood Diseases and Resources			
Pediatric Hydroxyurea in Sickle Cell Anemia (PED HUG)	926,000	0	926,000
Stroke Prevention in Sickle Cell Anemia (STOP)*	11,025,846	2,036,406	13,062,252
Subtotal, Blood Diseases and Resources	11,951,846	2,036,406	13,988,252
Total, NHLBI	\$97,118,614	\$25,807,329	\$122,925,943

*Indicates paid by U01/U10.

†Previously an Institute-Initiated Clinical Trial.

Institute-Initiated Clinical Trials: Fiscal Years 1988-98

Contracts

	(Dollars in Thousands)											
	1988	1989	1990	1991	Fiscal Year		1994	1995	1996	1997	1998	
					1992	1993						
Heart and Vascular Diseases												
Lipid Research Clinics	\$2,205	\$1,117	\$485	\$967	\$574	\$11	\$622	\$583	\$660	\$650	\$685	
Systolic Hypertension in the Elderly Program (SHEP)	2,447	3,820	2,887	1,295	404	369	—	—	—	—	—	
Thrombolysis in Myocardial Infarction Studies of Left Ventricular Dysfunction (SOLVD)	7,986	—	—	—	—	—	—	—	—	—	—	
Cardiac Arrhythmia Suppression Trial (CAST)	6,200	6,634	4,855	2,325	902	—	—	—	—	—	—	
Postcoronary Artery Bypass Graft (CABG) Study	8,125	8,968	9,988	4,872	2,193	—	29	—	—	—	—	
Prevention and Treatment of Hypertension Study (PATHS)	4,040	4,050	2,832	3,628	5,195	213	—	—	—	—	—	
Effects of Digitalis on Survival in Patients With Congestive Heart Failure	—	195	399	787	564	585	—	—	—	—	—	
Asymptomatic Cardiac Ischemia Pilot Study (ACIP)	—	—	604	2,619	3,272	3,464	270	2,235	—	—	—	
Psychophysiological Investigations of Myocardial Ischemia (PIMI)	—	—	—	2,862	2,720	630	210	7	—	—	—	
Arterial Disease Multifactorial Intervention Trial (ADMII)	—	—	—	335	1,400	1,400	433	165	—	—	—	
Raynaud's Treatment Study	—	—	—	—	663	2,062	2,341	395	—	—	—	
Antiarrhythmic Versus Implantable Defibrillator (AVID)	—	—	—	—	339	1,131	2,532	1,664	221	19	—	
Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT)	—	—	—	—	250	1,203	1,068	5,348	2,475	—	871	
Activity Counseling Trial (ACT)	—	—	—	—	—	2,760	10,914	3,412	9,676	15,943	17,119	
Postmenopausal Estrogen/Progestin Interventions (PEPI)	—	—	—	—	—	—	1,260	5,000	—	2,167	2,439	
Enhancing Recovery in Coronary Heart Disease Patients (ENRICHED)	—	—	—	—	—	—	600	1,305	—	3	170	
Atrial Fibrillation Follow-up: Investigation in Rhythm Management (AFFIRM)	—	—	—	—	—	—	—	1,871	6,993	6,837	5,904	
Beta-Blocker Evaluation Survival Trial (BEST)	—	—	—	—	—	—	—	883	2,510	6,330	—	
Women's Angiographic Vitamin and Estrogen Trial (WAVE)	—	—	—	—	—	—	—	—	2,500	1,435	2,300	2,448
Women's Ischemia Syndrome Evaluation (WISE)	—	—	—	—	—	—	—	—	731	2,891	1,917	
Prevention of Events With Angiotensin Converting Enzyme Inhibitor Therapy (PEACE)	—	—	—	—	—	—	—	—	1,577	133	2,932	
Magnesium in Coronaries (MAGIC)	—	—	—	—	—	—	—	—	—	—	—	1,169
Subtotal, Heart and Vascular Diseases	31,003	24,784	22,050	19,690	18,476	13,828	20,279	25,368	29,910	40,111	38,490	
Lung Diseases												
High Frequency Intervention	300	—	—	—	—	—	—	—	—	—	—	—
Lung Health Study I	2,898	5,349	5,875	7,016	10,496	—	3,398	650	350	—	—	—
Childhood Asthma Management Program (CAMP)	—	—	—	1,289	—	11,361	9,745	5,096	7,977	5,695	—	—
Acute Respiratory Distress Syndrome Clinical Network (ARDSNET)	—	—	—	—	—	—	1,800	4,170	4,337	4,510	4,880	—
National Emphysema Treatment Trial (NETT)	—	—	—	—	—	—	—	—	—	2,710	3,367	—
Subtotal, Lung Diseases	3,198	5,349	5,875	8,305	10,496	11,361	14,943	9,916	12,664	12,915	8,247	

Institute-Initiated Clinical Trials: Fiscal Years 1988-98 (continued)

Contracts

	(Dollars in Thousands)										
	1988	1989	1990	1991	1992	Fiscal Year		1995	1996	1997	1998
						1993	1994				
Blood Diseases and Resources											
Clinical Course of Sickle Cell Disease	2,328	2,361	2,118	1,609	2,161	1,756	2,390	4,375	376	205	2,144
Penicillin Prophylaxis in Sickle Cell Disease (PROPS II)	860	686	860	1,013	1,058	1,095	226	—	—	—	—
Anti-HIV Immunoglobulin (HIVIG) in Prevention of Maternal-Fetal HIV Transmission	—	—	—	3,016	—	—	3,016	1,819	706	—	—
T-Cell Depletion in Unrelated Donor Marrow	—	—	—	—	—	—	1,310	1,917	1,461	639	2,228
Viral Activation Transfusion Study (VATS)	—	—	—	—	—	—	—	5,000	5,647	2,353	1,668
Cord Blood Stem Cell Transplantation Study	—	—	—	—	—	—	—	—	1,419	6,573	12,530
Multicenter Study of Hydroxyurea in Sickle Cell Anemia Adult Follow-up (MSH)	—	—	—	—	—	—	—	—	703	472	475
Subtotal, Blood Diseases and Resources	3,188	3,047	2,978	5,638	3,219	2,851	6,942	13,111	10,312	10,242	19,045
Total, NHLBI, Contracts	\$37,389	\$33,180	\$30,903	\$33,633	\$32,191	\$28,040	\$42,164	\$48,395	\$52,886	\$63,268	\$65,782

Institute-Initiated Clinical Trials: Fiscal Years 1988-98

Cooperative Agreements

	(Dollars in Thousands)										
	1988	1989	1990	1991	1992	Fiscal Year		1995	1996	1997	1998
						1993	1994				
Heart and Vascular Diseases											
Trials of Hypertension Prevention (TOHP)	\$5,020	\$4,774	\$5,760	\$6,846	\$5,435	\$5,111	\$4,385	\$1,240	\$649	\$—	\$—
Dietary Intervention Study in Children (DISC)	2,051	3,023	4,616	2,154	2,018	1,686	1,615	1,625	1,625	746	—
Bypass Angioplasty Revascularization Investigation (BARI)	4,545	5,539	6,216	6,309	3,952	3,978	3,965	3,882	2,757	2,894	1,360
Postmenopausal Estrogen/Progestin Interventions (PEPI)	2,882	1,336	2,158	2,801	2,554	1,516	1,109	584	331	—	—
Child and Adolescent Trial for Cardiovascular Health (CATCH)	1,919	1,977	1,012	5,920	5,501	6,077	2,586	2,342	2,682	3,956	572
Cholesterol Reduction in Seniors Program (CRISP)	—	—	150	1,496	850	—	—	—	—	—	—
Dietary Effects on Lipoproteins and Thrombogenic Activity (DELTA)	—	—	—	—	1,950	3,213	3,121	2,485	132	290	—
Obesity Prevention in American Indians (PATHWAYS)	—	—	—	—	—	1,689	1,814	2,150	3,432	4,119	3,945
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
Subtotal, Heart and Vascular Diseases	16,417	16,649	19,912	25,526	22,260	24,920	23,554	21,912	17,499	14,871	6,373
Lung Diseases											
Asthma Clinical Research Network	—	—	—	—	—	2,500	3,694	3,640	4,526	4,479	5,849
Asthma and Pregnancy Studies	—	—	—	—	—	—	1,000	991	1,000	913	—
Subtotal, Lung Diseases	—	—	—	—	—	2,500	4,694	4,631	5,526	5,392	5,849

Institute-Initiated Clinical Trials: Fiscal Years 1988-98 (continued)

Cooperative Agreements

	(Dollars in Thousands)											
	1988	1989	1990	1991	1992	Fiscal Year		1995	1996	1997	1998	
						1993	1994					
Blood Diseases and Resources												
Hydroxyurea in Patients With Sickle Cell Anemia, Phase I Trial To Reduce Alloimmunization to Platelets (TRAP)	479	509	44	—	—	—	—	—	—	—	—	
Subtotal, Blood Diseases and Resources	479	1,256	2,034	2,111	3,483	1,422	—	—	—	—	—	
Total, NHLBI, Cooperative Agreements	\$16,896	\$17,905	\$21,990	\$27,637	\$25,743	\$28,842	\$28,248	\$26,543	\$23,025	\$20,263	\$12,222	
Total, NHLBI-Initiated Clinical Trials	\$54,285	\$51,085	\$52,893	\$61,270	\$57,934	\$56,882	\$70,412	\$74,938	\$75,911	\$83,531	\$78,004	

Institute-Initiated Clinical Trials, Fiscal Year 1998: Summary by Program

Contracts

	Total Obligations Prior to FY 1998	Total FY 1998 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Activity Counseling Trial (ACT)	\$8,426,847	\$2,439,000	\$10,865,847
Antiarrhythmic Versus Implantable Defibrillator (AVID)	10,343,617	871,383	11,215,000
Antihypertensive and Lipid-Lowering Treatment To Prevent Heart Attack Trial (ALLHAT)	42,705,355	17,119,000	59,824,355
Atrial Fibrillation Follow-up: Investigation in Rhythm Management (AFFIRM)	9,723,215	—	9,723,215
Beta-Blocker Evaluation Survival Trial (BEST)	6,235,000	2,448,000	8,683,000
Enhancing Recovery in Coronary Heart Disease Patients (ENRICHED)	15,700,861	5,904,000	21,604,861
Lipid Research Clinics	190,488,255	685,000	191,173,255
Magnesium in Coronaries (MAGIC)	—	1,169,145	1,169,145
Postmenopausal Estrogen/Progestin Interventions (PEPI)	1,908,508	170,339	2,078,847
Prevention of Events With Angiotensin Converting Enzyme Inhibitor Therapy (PEACE)	6,469,228	2,835,602	9,304,830
Raynaud's Treatment Study	5,905,609	—	5,905,609
Women's Angiographic Vitamin and Estrogen Trial (WAVE)	3,621,899	1,917,000	5,538,899
Women's Ischemia Syndrome Evaluation (WISE)	1,709,931	2,932,000	4,641,931
Subtotal, Heart and Vascular Diseases	303,238,325	38,490,469	341,728,794
Lung Diseases			
Acute Respiratory Distress Syndrome Clinical Network (ARDSNET)	14,817,000	4,880,000	19,697,000
Childhood Asthma Management Program (CAMP)	41,162,800	—	41,162,800
Lung Health Study I	48,938,219	—	48,938,219
National Emphysema Treatment Trial (NETT)	2,710,000	3,367,000	6,077,000
Subtotal, Lung Diseases	107,628,019	8,247,000	115,875,019
Blood Diseases and Resources			
Clinical Course of Sickle Cell Disease (CSSCD)	55,973,498	2,143,678	58,117,176
Cord Blood Stem Cell Transplantation Study	7,991,661	12,530,000	20,521,661
Multicenter Study of Hydroxyurea in Sickle Cell Anemia Adult Follow-Up (MSH)	1,175,723	474,584	1,650,307
Penicillin Prophylaxis in Sickle Cell Disease (PROPS II)	6,195,145	—	6,195,145
T-Cell Depletion in Unrelated Donor Marrow	5,327,733	2,228,000	7,555,733
Viral Activation Transfusion Study (VATS)	13,000,555	1,668,000	14,668,555
Subtotal, Blood Diseases and Resources	89,664,315	19,044,262	108,708,577
Total, NHLBI, Clinical Trial, Contracts	\$500,530,659	\$65,781,731	\$566,312,390

Institute-Initiated Clinical Trials, Fiscal Year 1998: Summary by Program (continued)

Cooperative Agreements

	Total Obligations Prior to FY 1998*	Total FY 1998 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Bypass Angioplasty Revascularization Investigation (BARI)	\$44,754,700	\$1,360,006	\$46,114,706
Child and Adolescent Trial for Cardiovascular Health (CATCH)	35,181,938	571,758	35,753,696
Dietary Effects on Lipoproteins and Thrombogenic Activity (DELTA)	11,191,770	—	11,191,770
Dietary Intervention Study in Children (DISC)	22,328,450	—	22,328,450
Obesity Prevention in American Indians (PATHWAYS)	13,203,608	3,945,374	17,148,982
Postmenopausal Estrogen/Progestin Interventions (PEPI)	15,826,700	—	15,826,700
Rapid Early Action for Coronary Treatment (REACT)	15,557,661	495,622	16,053,283
Trials of Hypertension Prevention (TOHP)	46,884,735	—	46,884,735
Subtotal, Heart and Vascular Diseases	204,929,562	6,372,760	211,302,322
Lung Diseases			
Asthma Clinical Research Network (ACRN)	18,839,996	5,849,329	24,689,325
Asthma and Pregnancy Studies	3,903,553	—	3,903,553
Subtotal, Lung Diseases	22,743,549	5,849,329	28,592,878
Blood Diseases and Resources			
Subtotal, Blood Diseases and Resources	0	0	0
Total, NHLBI-Initiated Clinical Trials, Cooperative Agreements	\$227,673,111	\$12,222,089	\$239,895,200
Total, NHLBI-Initiated Clinical Trials	\$728,203,770	\$78,003,820	\$806,207,590

Heart and Vascular Diseases Program

Activity Counseling Trial (ACT), Initiated in Fiscal Year 1994

This trial is testing the effectiveness of various behavioral interventions delivered in health care settings to increase physical activity among sedentary patients. The effects of a staff-assistance intervention, a staff-counseling intervention, and a control group receiving only physician advice on physical activity and cardiorespiratory fitness are compared.

Obligations

Funding History:

Fiscal Year 1998—\$2,439,000
Fiscal Years 1994-97—\$8,426,847
Total Funding to Date—\$10,865,847

Current Active Organizations and Contract Numbers

- Cooper Institute for Aerobics Research
Dallas, Texas —HC-45135
- Leland Stanford Junior University
Stanford, California —HC-45136

- University of Tennessee
Memphis, Tennessee —HC-45137
- Wake Forest University
Winston Salem, North Carolina —HC-45138

Antiarrhythmic Versus Implantable Defibrillator (AVID), Initiated in Fiscal Year 1992

This randomized clinical trial determined whether use of an implantable cardiac defibrillator (ICD) reduced total mortality, compared with conventional pharmacologic therapy, in patients who had been resuscitated from sudden cardiac death or were otherwise at very high risk of mortality from arrhythmic causes. The trial was stopped early in April 1997 because of the finding that after one year, patients in the ICD group experienced a nearly 38 percent reduction in deaths.

Obligations

Funding History:

Fiscal Year 1998—\$871,383
Fiscal Years 1992-97—\$10,343,617

Total Funding to Date—\$11,215,000

Current Active Organization and Contract Number

1. University of Washington
Seattle, Washington —HC-25117

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 (angiotensin converting enzyme [ACE] inhibitor, calcium channel blocker, alpha blocker) in high-risk hypertensive patients. The lipid-lowering component of the study is determining 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.

Obligations

Funding History:

- Fiscal Year 1998—\$17,119,000
- Fiscal Years 1993-97—\$42,705,355
- Total Funding to Date—\$59,824,355

Current Active Organization and Contract Number

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

Atrial Fibrillation Follow-up: Investigation in Rhythm Management (AFFIRM), Initiated in Fiscal Year 1995

This clinical trial compares the impact on total mortality of antiarrhythmic drugs to maintain sinus rhythm to a strategy of merely controlling the heart rate. Important secondary end points include quality of life and cost of therapies.

Obligations

Funding History:

- Fiscal Year 1998—\$0
- Fiscal Years 1995-97—\$9,723,215
- Total Funding to Date—\$9,723,215

Current Active Organization and Contract Number

1. Statistics and Epidemiology
Research Corporation
Seattle, Washington —HC-55139

Beta-Blocker Evaluation Survival Trial (BEST), Initiated in Fiscal Year 1995

The primary objective of this clinical trial is to determine whether addition of a beta-blocking agent (bucindolol) to standard therapy reduces total mortality of patients with moderate to severe CHF.

Obligations

Funding History:

- Fiscal Year 1998—\$2,448,000
- Fiscal Years 1995-97—\$6,235,000
- Total Funding to Date—\$8,683,000

Current Active Organization and Contract Number

1. U.S. Department of Veterans Affairs
Medical Center
Palo Alto, California —HC-70180

Bypass Angioplasty Revascularization Investigation (BARI), Initiated in Fiscal Year 1987

This trial assesses the long-term relative efficacy of percutaneous transluminal coronary angioplasty and coronary artery bypass graft surgery in patients who require revascularization and have coronary anatomy suitable for either procedure.

Obligations

Funding History:

- Fiscal Year 1998—\$1,360,006
- Fiscal Years 1987-97—\$44,754,700
- Total Funding to Date—\$46,114,706

Current Active Organizations and Grant Numbers

Clinical Units

1. Mayo Foundation
Rochester, Minnesota —HL-38493
2. Saint Louis University
St. Louis, Missouri —HL-38504
3. Montreal Heart Institute
Montreal, Canada —HL-38509
4. University of Alabama
Birmingham, Alabama —HL-38512
5. Beth Israel Hospital
Boston, Massachusetts —HL-38514
6. Virginia Commonwealth
University
Richmond, Virginia —HL-38515
7. Duke University
Durham, North Carolina —HL-38516
8. Cleveland Clinic Foundation
Cleveland, Ohio —HL-38518

9. New York Medical College Valhalla, New York	—HL-38524
10. University Hospital Boston, Massachusetts	—HL-38525
11. University of Michigan Ann Arbor, Michigan	—HL-38529
12. Rhode Island Hospital Providence, Rhode Island	—HL-38532
13. University of Massachusetts Medical School Worcester, Massachusetts	—HL-38556
Coordinating Center and Core Laboratories	
14. University of Pittsburgh Pittsburgh, Pennsylvania	—HL-38610
15. Stanford University Stanford, California	—HL-38642
16. Saint Louis University St. Louis, Missouri	—HL-42145

Child and Adolescent Trial for Cardiovascular Health (CATCH), Initiated in Fiscal Year 1987

This trial examined the effectiveness of school and home interventions for reducing CVD risk. Intervention components included a school food service program, a physical education program, a classroom curriculum, and a home curriculum. The children's behavioral and physiological risk factors were tracked into their adolescent years. Final data analysis is in progress.

Obligations

Funding History:

Fiscal Year 1998—\$571,758

Fiscal Years 1987-97—\$35,181,938

Total Funding to Date—\$35,753,696

Current Active Organizations and Grant Numbers

1. University of Minnesota Minneapolis, Minnesota	—HL-39852
2. University of California, San Diego La Jolla, California	—HL-39870
3. Tulane University of Public Health and Tropical Medicine New Orleans, Louisiana	—HL-39906
4. University of Texas Health Science Center Houston, Texas	—HL-39927
5. New England Research Institutes, Inc. Watertown, Massachusetts	—HL-47098

Dietary Effects on Lipoproteins and Thrombogenic Activity (DELTA), Initiated in Fiscal Year 1992

The DELTA study is evaluating the effects of carefully controlled diets on lipoproteins and clotting factors in different demographic groups.

Obligations

Funding History:

Fiscal Year 1998—\$0

Fiscal Years 1992-97—\$11,191,770

Total Funding to Date—\$11,191,770

Current Active Organizations and Grant Numbers

1. University of North Carolina Chapel Hill, North Carolina	—HL-49644
2. University of Minnesota Minneapolis, Minnesota	—HL-49649
3. Columbia University New York, New York	—HL-49648
4. Pennsylvania State University University Park, Pennsylvania	—HL-49659
5. Louisiana State University New Orleans, Louisiana	—HL-49651

Dietary Intervention Study in Children (DISC), Initiated in Fiscal Year 1987

The objective of the DISC trial was to assess the feasibility, acceptability, efficacy, and safety of dietary intervention in children and adolescents with elevated LDL cholesterol levels.

Obligations

Funding History:

Fiscal Year 1998—\$0

Fiscal Years 1987-97—\$22,328,450

Total Funding to Date—\$22,328,450

Current Active Organizations and Grant Numbers

1. Northwestern University Chicago, Illinois	—HL-37947
2. Maryland Medical Research Institute Baltimore, Maryland	—HL-37948
3. Kaiser Foundation Research Institute Portland, Oregon	—HL-37954
4. University of Iowa Iowa City, Iowa	—HL-37962
5. University of Medicine and Dentistry of New Jersey Newark, New Jersey	—HL-37966
6. The Johns Hopkins University Baltimore, Maryland	—HL-37975
7. Children's Hospital New Orleans, Louisiana	—HL-38110

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

The objective of this multicenter, randomized clinical trial is to test the efficacy of interventions that provide social support and ameliorate depression in post-MI patients. CHD death and reinfarction are primary end points. Secondary outcomes include health-related quality of life and adherence to medical and lifestyle change regimens.

Obligations

Funding History:

Fiscal Year 1998—\$5,904,000

Fiscal Years 1995-97—\$15,700,861

Total Funding to Date—\$21,604,861

Current Active Organizations and Contract Numbers

1. University of North Carolina
Chapel Hill, North Carolina —HC-55140
2. University of Alabama
Birmingham, Alabama —HC-55141
3. Duke University
Durham, North Carolina —HC-55142
4. University of Miami
Coral Gables, Florida —HC-55143
5. Rush-Presbyterian-St. Lukes
Medical Center
Chicago, Illinois —HC-55144
6. Stanford University
Palo Alto, California —HC-55145
7. Washington University
St. Louis, Missouri —HC-55146
8. Yale University
New Haven, Connecticut —HC-55148
9. University of Washington
Seattle, Washington —HC-55147

Magnesium in Coronaries (MAGIC), Initiated in Fiscal Year 1998

The multicenter trial will determine whether intravenous magnesium will reduce the short-term mortality of high-risk patients with suspected acute MI when it is administered sufficiently early to reduce reperfusion injury.

Obligations

Funding History:

Fiscal Year 1998—\$1,169,145

Total Funding to Date—\$1,169,145

Current Active Organization and Contract Number

1. New England Research Institutes, Inc.,
Watertown, Massachusetts —HC-85155

Obesity Prevention in Young American Indians (PATHWAYS), Initiated in Fiscal Year 1993

This full-scale trial assesses the effectiveness of a school-based intervention in primary prevention of obesity among American Indian elementary school children.

Obligations

Funding History:

Fiscal Year 1998—\$3,945,374

Fiscal Years 1993-97—\$13,203,608

Total Funding to Date—\$17,148,982

Current Active Organizations and Grant Numbers

1. Coordinating Center:
University of North Carolina
Chapel Hill, North Carolina —HL-50907
2. University of New Mexico
Albuquerque, New Mexico —HL-50867
3. The Johns Hopkins University
Baltimore, Maryland —HL-50869
4. University of Minnesota
Minneapolis, Minnesota —HL-50885
5. Gila River Indian Community
Sacaton, Arizona —HL-50905

Postmenopausal Estrogen/Progestin Interventions (PEPI), Initiated in Fiscal Year 1987

The PEPI trial assessed the effects of various postmenopausal estrogen replacement therapies on selected cardiovascular risk factors and osteoporosis risk factors. In FY 1994, a 3-year follow-up to assess endometrial and breast cancer risk was begun with contract support.

Obligations

Funding History: Contracts

Fiscal Year 1998—\$170,339

Fiscal Years 1994-97—\$1,908,508

Total Funding to Date—\$2,078,847

Funding History: Cooperative Agreements

Fiscal Year 1997—\$0

Fiscal Years 1987-96—\$15,826,700

Total Funding to Date—\$15,826,700

Current Active Organizations and Contract Numbers

1. The Johns Hopkins University
Baltimore, Maryland —HV-48133
2. Stanford University
Stanford, California —HV-48134
3. University of California
Los Angeles, California —HV-48135
4. University of California
San Diego, California —HV-48136
5. University of Iowa
Iowa City, Iowa —HV-48137
6. University of Texas Health Science Center
San Antonio, Texas —HV-48138
7. Bowman Gray School of Medicine
Winston-Salem, North Carolina —HV-48139

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

The 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 experiencing an MI.

Obligations

Funding History:

Fiscal Year 1998—\$2,835,602
Fiscal Years 1996-97—\$6,469,228
Total Funding to Date—\$9,304,830

Current Active Organization and Contract Number

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

Rapid Early Action for Coronary Treatment (REACT), Initiated in Fiscal Year 1994

This community trial investigates the effectiveness and impact of community educational interventions on patient delay time from experiencing symptoms of acute MI to contact with the health care system. Interventions include provider and patient education, public education, and community organization.

Obligations

Funding History:

Fiscal Year 1998—\$495,622
Fiscal Years 1994-97—\$15,557,661
Total Funding to Date—\$16,053,283

Current Active Organizations and Grant Numbers

1. University of Texas Health
Science Center
Houston, Texas —HL-53135
2. King County Department of
Emergency Medical Services
Seattle, Washington —HL-53141
3. University of Alabama
Birmingham, Alabama —HL-53142
4. New England Research Institutes, Inc.
Watertown, Massachusetts —HL-53149
5. University of Minnesota
Minneapolis, Minnesota —HL-53211
6. Tufts University
Boston, Massachusetts —HL-54517

Raynaud's Treatment Study, Initiated in Fiscal Year 1992

The goal of this randomized multicenter clinical trial of primary Raynaud's patients is to test the efficacy of Nifedipine XL and temperature biofeedback and to compare the two treatments. The outcome is a self-reported, 1-month attack rate collected 1 year after randomization.

Obligations

Funding History:

Fiscal Year 1998—\$0
Fiscal Years 1992-97—\$5,905,609
Total Funding to Date—\$5,905,609

Current Active Organization and Contract Number

1. University of Medicine and Dentistry
of New Jersey
New Brunswick, New Jersey —HC-25120

Trials of Hypertension Prevention (TOHP), Initiated in Fiscal Year 1986

This trial tested the feasibility and efficacy of nonpharmacological interventions in the primary prevention of hypertension in men and women at increased risk of developing hypertension.

Obligations

Funding History:

Fiscal Year 1998—\$0
Fiscal Years 1986-97—\$46,884,735
Total Funding to Date—\$46,884,735

Current Active Organization and Grant Number

1. Brigham and Women's Hospital
Boston, Massachusetts —HL-37852

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

The 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 1998—\$1,917,000
Fiscal Years 1996-97—\$3,621,899
Total Funding to Date—\$5,538,899

Current Active Organizations and Grant Numbers

1. George Washington University
Washington, DC —HV-68165
2. University of Alabama
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

Women's Ischemia Syndrome Evaluation (WISE), Initiated in Fiscal Year 1996

The multicenter trial seeks to improve diagnostic reliability of cardiovascular testing in the evaluation of ischemic heart disease in women. Secondary objectives are to develop safe, efficient, and cost-effective diagnostic approaches for evaluating women with suspected ischemic heart disease; to determine the frequency of myocardial ischemia in the absence of significant epicardial coronary stenosis; and to ascertain the frequency of nonischemic or noncardiac chest pain.

Obligations

Funding History:

Fiscal Year 1998—\$2,932,000
Fiscal Years 1996-97—\$1,709,931
Total Funding to Date—\$4,641,931

Current Active Organizations and Contract Numbers

1. University of Alabama
Birmingham, Alabama —HV-68161
2. University of Pittsburgh
Pittsburgh, Pennsylvania —HV-68162
3. Allegheny Singer Research Institute
Pittsburgh, Pennsylvania —HV-68164

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 1998—\$4,880,000
Fiscal Years 1994-97—\$14,817,000
Total Funding to Date—\$19,697,000

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, 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

Asthma Clinical Research Network (ACRN), Initiated in Fiscal Year 1993

The objective of this study is to establish a network of interactive asthma clinical research groups to rapidly assess novel treatment methods and to ensure that findings on optimal management of asthmatic patients are rapidly disseminated to practitioners and health care professionals.

Obligations

Funding History:

Fiscal Year 1998—\$5,849,329

Fiscal Years 1993-97—\$18,839,996

Total Funding to Date—\$24,689,325

Current Active Organizations and Grant Numbers

1. Jefferson Medical College
Philadelphia, Pennsylvania —HL-51810
2. University of California, San Francisco
San Francisco, California —HL-51823
3. Brigham and Women's Hospital
Boston, Massachusetts —HL-51831
4. National Jewish Center for Immunology
and Respiratory Medicine
Denver, Colorado —HL-51834
5. University of Wisconsin
Madison, Wisconsin —HL-51843
6. Pennsylvania State University
Hershey, Pennsylvania —HL-51845
7. Columbia University
New York, New York —HL-56443

Asthma and Pregnancy Studies, Initiated in Fiscal Year 1994

This 4-year multicenter collaborative study is determining the effects of asthma and its treatment on pregnancy and how pregnancy affects asthma. Women were enrolled from 11 clinical centers as part of the NICHD Maternal Fetal Medicine Units Clinical Network.

Obligations

Funding History:

Fiscal Year 1998—\$0

Fiscal Years 1994-97—\$3,903,553

Total Funding to Date—\$3,903,553

Current Active Organizations and Grant Numbers

1. University of Tennessee
Memphis, Tennessee —HD-21414
2. University of Alabama
Birmingham, Alabama —HD-27869

3. Ohio State University
Columbus, Ohio —HD-27915
4. Wayne State University
Detroit, Michigan —HD-27917
5. University of Texas
Southwest Medical Center
Dallas, Texas —HD-34116
6. University of Miami
Miami, Florida —HD-34122
7. Thomas Jefferson University
Philadelphia, Pennsylvania —HD-34136
8. University of Utah
Salt Lake City, Utah —HD-34208
9. University of Texas
Health Sciences Center
San Antonio, Texas —HD-34210
10. Wake Forest University
Winston Salem, North Carolina —HD-27860
11. University of Chicago
Chicago, Illinois —HD-27861
12. Magee-Women's Hospital
Pittsburgh, Pennsylvania —HD-21410
13. University of Cincinnati
Cincinnati, Ohio —HD-27905

Childhood Asthma Management Program (CAMP), Initiated in Fiscal Year 1991

The purpose of this study was to determine, in a population of 5- to 9-year-old children with asthma, if, in combination with as-needed use of beta₂ agonist bronchodilator, regular use of either of two types of anti-inflammatory medications results in greater lung function, less bronchial hyperresponsiveness, patient morbidity, and use of health care resources, and improved quality of life during a 5-year period. The study also compared the long-term safety and side effects of the three medications during the 5-year period.

Obligations

Funding History:

Fiscal Year 1998—\$0

Fiscal Years 1991-97—\$41,162,800

Total Funding to Date—\$41,162,800

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, Canada —HR-16047

5. National Jewish Center for Immunology and Respiratory Medicine
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

Lung Health Study, Initiated in Fiscal Year 1984

The trial determined the effects of "special care" compared with "usual care" on rate of decline in pulmonary function in a population of smokers identified as having mild abnormalities in pulmonary function. Special care included smoking cessation counseling, bronchodilator administration, and diligent follow-up. In usual care, the subject was referred to his usual source of medical care.

Obligations

Funding History:

- Fiscal Year 1998—\$0
- Fiscal Years 1984-97—\$48,938,219
- Total Funding to Date—\$48,938,219

Current Active Organization and Contract Number

1. Coordinating Center:
University of Minnesota
Minneapolis, Minnesota —HR-46002

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 1998—\$3,367,000
- Fiscal Year 1997—\$2,710,000
- Total Funding to Date—\$6,077,000

Current Active Organizations and Contract Numbers

1. Johns Hopkins University
Baltimore, Maryland —HR-76119
2. Baylor College of Medicine
Houston, Texas —HR-76101
3. Brigham and Women's Hospital
Boston, Massachusetts —HR-76102
4. University of California
San Diego, California —HR-76103
5. Cedars-Sinai Medical Center
Los Angeles, California —HR-76104
6. Cleveland Clinic Foundation
Cleveland, Ohio —HR-76105
7. Columbia University
New York, New York —HR-76106
8. Duke University Medical Center
Durham, North Carolina —HR-76107
9. University of Maryland
Baltimore, Maryland —HR-76108
10. Mayo Foundation
Rochester, Minnesota —HR-76109
11. University of Michigan
Ann Arbor, Michigan —HR-76110
12. National Jewish Center for
Immunology/Respiratory Medicine
Denver, Colorado —HR-76111
13. Ohio State University
Columbus, Ohio —HR-76112
14. University of Pennsylvania
Philadelphia, Pennsylvania —HR-76113
15. University of Pittsburgh
Pittsburgh, Pennsylvania —HR-76114
16. Saint Louis University
St. Louis, Missouri —HR-76115
17. Temple University
Philadelphia, Pennsylvania —HR-76116
18. Washington University
St. Louis, Missouri —HR-76117
19. University of Washington
Seattle, Washington —HR-76118

Blood Diseases and Resources Program

Clinical Course of Sickle Cell Disease, Initiated in Fiscal Year 1977

This collaborative study is designed to identify and evaluate the factors that determine the clinical course of, and the presence or absence of complications in SCD.

Obligations

Funding History:

Fiscal Year 1998—\$2,143,678

Fiscal Years 1977-97—\$55,973,498

Total Funding to Date—\$58,117,176

Current Active Organizations and Contract Numbers

1. Washington University
St. Louis, Missouri —HB-47099
2. St. Jude Children's Research Hospital
Memphis, Tennessee —HB-47100
3. St. Luke's-Roosevelt Institute for
Health Science
New York, New York —HB-47103
4. University of Illinois at Chicago
Chicago, Illinois —HB-47104
5. Interfaith Medical Center, Brooklyn
New York, New York —HB-47105
6. Duke University
Durham, North Carolina —HB-47106
7. Children's Hospital Medical Center
Oakland, California —HB-47107
8. Health Science Center at Brooklyn
New York, New York —HB-47108
9. Children's Hospital of Philadelphia
Philadelphia, Pennsylvania —HB-47109
10. New England Research Institutes, Inc.
Watertown, Massachusetts —HB-47110
11. University of Miami
Miami, Florida —HB-47111
12. Columbia University, New York
New York, New York —HB-47112
3. Fred Hutchinson Cancer Research Center
Seattle, Washington —HB-67134
4. University of California at Los Angeles
Los Angeles, California —HB-67135
5. Children's Hospital of Orange County
Orange, California —HB-67136
6. Indiana University
Indianapolis, Indiana —HB-67137
7. Duke University Medical Center
Durham, North Carolina —HB-67138
8. University of Minnesota
Minneapolis, Minnesota —HB-67139
9. Duke University Medical Center
Durham, North Carolina —HB-67141
10. University of California at Los Angeles
Los Angeles, California —HB-67142

Cord Blood Stem Cell Transplantation Study, Initiated in Fiscal Year 1996

The 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 1998—\$12,530,000

Fiscal Years 1996-97—\$7,991,661

Total Funding to Date—\$20,521,661

Current Active Organizations and Contract Numbers

1. Emmes Corporation
Potomac, Maryland —HB-67132
2. Dana-Farber Cancer Center
Boston, Massachusetts —HB-67133

Multicenter Study of Hydroxyurea in Sickle Cell Anemia (MSH) Adult Follow-up, Initiated in Fiscal Year 1996

The MSH was designed to test the efficacy of orally administered hydroxyurea in the lowering of painful crisis rates of sickle cell anemia. The trial was stopped early because of proof of efficacy of hydroxyurea in decreasing painful sickle cell crises, hospitalizations for painful crises, acute chest syndrome, and total number of units of transfused blood by approximately 50 percent. The Data Coordinating Center is now in active follow-up of adult patients for the long-term effects, if any, of hydroxyurea.

Obligations

Funding History:

Fiscal Year 1998—\$474,584

Fiscal Years 1996-97—\$1,175,723

Total Funding to Date—\$1,650,307

Current Active Organization and Contract Number

1. Maryland Medical Research Institute
Baltimore, Maryland —HB-67129

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 1998—\$2,228,000

Fiscal Years 1994-97—\$5,327,733

Total Funding to Date—\$7,555,733

Current Active Organizations and Contract Numbers

- | | |
|---------------------------------------------------------------------------|-----------|
| 1. Emmes Corporation
Potomac, Maryland | —HB-47094 |
| 2. University of Minnesota
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 |

Viral Activation Transfusion Study (VATS), Initiated in Fiscal Year 1995

This trial is designed to determine if activation of HIV-1 and cytomegalovirus occurs following blood transfusion in HIV-1-infected persons, thereby adversely affecting their prognosis. This study is also evaluating the role of donor leukocytes producing this activation by examining the effect of removing leukocytes by filtration or abolishing their ability to proliferate by gamma irradiation.

Obligations

Funding History:

Fiscal Year 1998—\$1,668,000

Fiscal Year 1995-97—\$13,000,555

Total Funding to Date—\$14,668,555

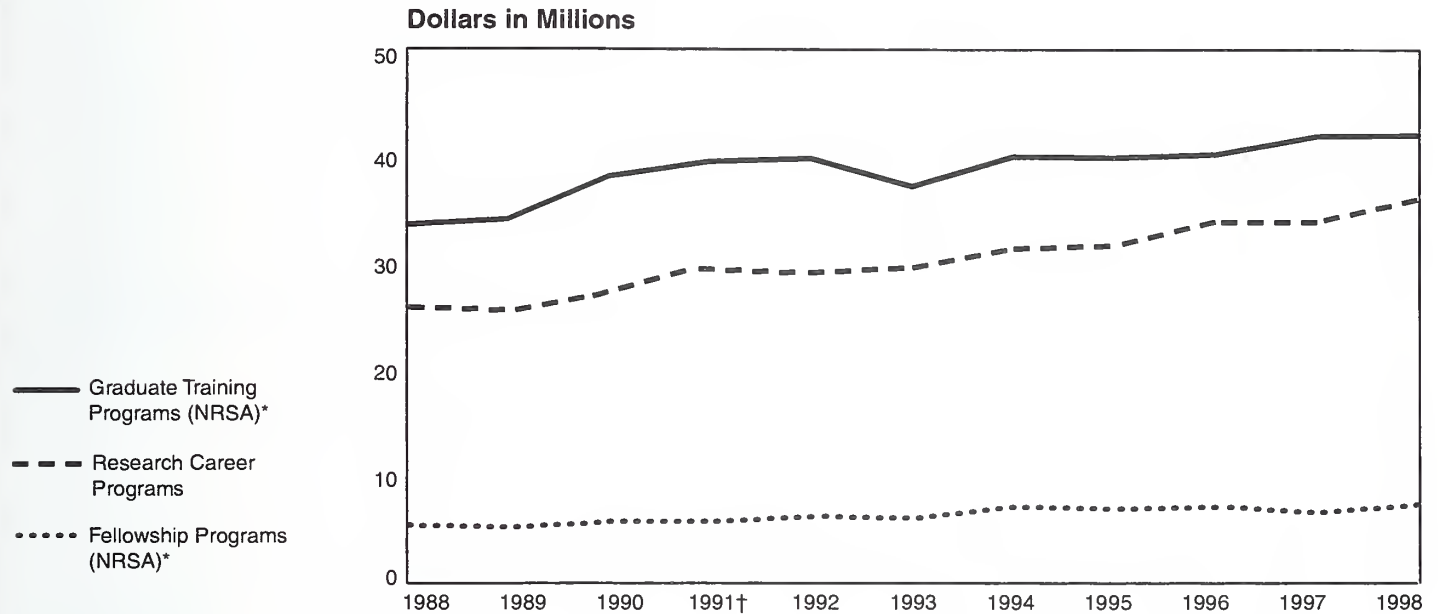
Current Active Organizations and Contract Numbers

- | | |
|-----------------------------------------------------------------------------------------------|-----------|
| 1. Case Western Reserve University
Cleveland, Ohio | —HB-57115 |
| 2. Georgetown University
Washington, DC | —HB-57116 |
| 3. The Miriam Hospital
Providence, Rhode Island | —HB-57117 |
| 4. Mt. Sinai Medical Center
New York, New York | —HB-57118 |
| 5. The Ohio State University
Columbus, Ohio | —HB-57119 |
| 6. University of California, San Diego
La Jolla, California | —HB-57120 |
| 7. University of California
San Francisco, California | —HB-57121 |
| 8. University of North Carolina
Chapel Hill, North Carolina | —HB-57122 |
| 9. University of Pittsburgh
Pittsburgh, Pennsylvania | —HB-57123 |
| 10. University of Texas
Galveston, Texas | —HB-57124 |
| 11. University of Washington
Seattle, Washington | —HB-57125 |
| 12. Central Laboratory:
Irwin Memorial Blood Center
San Francisco, California | —HB-57126 |
| 13. Coordinating Center:
New England Research Institutes, Inc.
Watertown, Massachusetts | —HB-57127 |

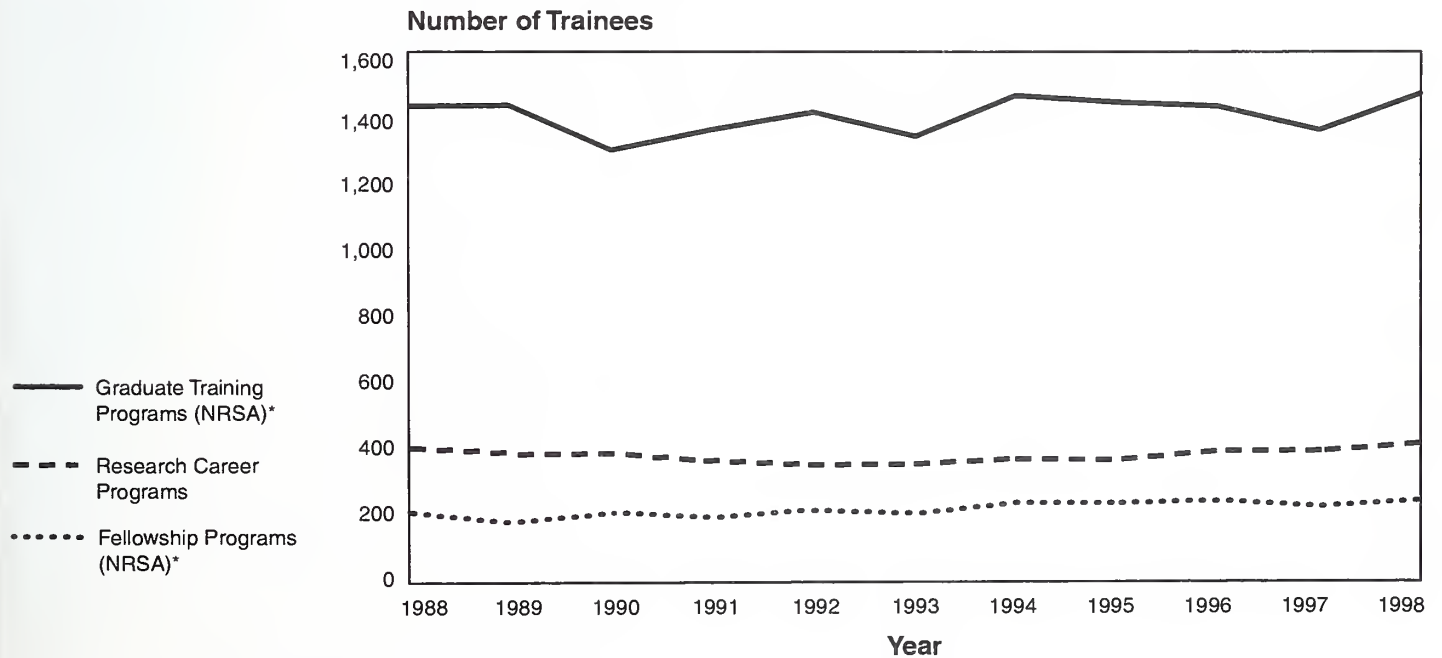


12. Research Training and Career Development Programs

NHLBI Research Training and Career Development Obligations: Fiscal Years 1988-98



NHLBI Full-Time Training Positions: Fiscal Years 1988-98



* National Research Service Awards.

† In FY 1991, the NIH increased the salary ceiling for research career awards from \$40,000 to \$50,000 and implemented a new stipend schedule for NRS Awards.

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 1998

	Number of Awards Obligated	Trainees (Full-Time Training Positions)	Direct Cost	Indirect Cost	Total Cost	Percent of Total NHLBI Training Program Dollars
Fellowship Programs						
Predocutorial Fellowship Award for Minority Students (F31)	19	19	\$ 466,337	\$ 0	\$ 466,337	0.9%
Individual NRSA (F32)	225	225	6,968,424	0	6,968,424	14.1
Senior Fellowships NRSA (F33)	4	4	125,079	0	125,079	0.3
Minority Access to Research Careers (MARC) Fellowships NRSA (F34)	0	0	0	0	0	0.0
Intramural NRSA (F35)	0	0	0	0	0	0.0
Subtotal, Fellowships	248	248	7,559,840	0	7,559,840	15.2
Graduate Training Programs						
Institutional NRSA (T32)	184	1,423	35,383,892	2,520,944	37,904,836	76.5
Minority Institutional NRSA (T32)	3	52	668,026	37,476	705,502	1.4
Off-Quarter Professional Student Training NRSA (T34, T35)	35	0	1,340,440	94,560	1,435,000	2.9
Minority Access to Research Careers (MARC) (T36)	0	0	5,000	0	5,000	0.0
Short-Term Training for Minority Students (T35M)	21	0	1,818,514	145,237	1,963,751	4.0
Subtotal, Training Grants	243	1,475	39,215,872	2,798,217	42,014,089*	84.8
Total, Training Programs	491	1,723	\$46,775,712	\$2,798,217	\$49,573,929*	100.0%

* Excludes assessment of \$1,032,000.

History of Training Obligations by Activity: Fiscal Years 1988-98

(Dollars in Thousands)

	1988	1989*	1990	1991*	Fiscal Year		1994	1995	1996	1997	1998
					1992	1993					
Fellowship Programs											
Predoctoral Fellowship Award for Minority Students (F31)	\$ —	\$ —	\$ —	\$ —	\$ 55	\$ 97	\$ 199	\$ 304	\$ 551	\$ 388	\$ 466
Individual NRSA (F32)	5,350	5,271	5,654	5,554	6,041	5,867	6,853	6,651	6,483	6,281	6,969
Senior Fellowships NRSA (F33)	6	95	129	205	141	141	141	99	233	179	125
Minority Access to Research Careers Fellowships NRSA (F34)	53	13	—	—	—	—	—	—	—	—	—
Intramural NRSA (F35)	147	30	91	133	146	70	69	49	—	—	—
Subtotal, Fellowships	5,556	5,409	5,874	5,892	6,383	6,175	7,262	7,103	7,267	6,848	7,560
Graduate Training Programs											
Institutional NRSA (T32)	32,031	32,273	36,751 ^A	37,533 ^B	37,355 ^C	34,846 ^D	36,534 ^E	36,270 ^F	36,718 ^G	38,253 ^H	37,904 ^I
Minority Institutional NRSA (T32)	288	348	398	432	684	35	735	982	679	898	706
Minority Summer Hypertension NRSA (T35, T34)	126	80	—	—	—	—	—	—	—	—	—
Minority Summer Pulmonary NRSA (T34, T35)	24	—	—	—	—	—	—	—	—	—	—
Off-Quarter Professional Student Training NRSA (T34, T35)	1,068	1,386	957	1,150	1,106	1,744	1,132	951	1,001	1,216	1,435
Minority Access to Research Careers (MARC) (T36)	14	10	19	19	22	15	5	5	5	5	5
Short-Term Training for Minority Students (T35M)	—	—	—	339	717	573	1,616	1,760	1,834	1,612	1,964
Subtotal, Training Grants	33,551	34,097	38,125 ^A	39,473 ^B	39,884 ^C	37,213 ^D	40,022 ^E	39,968 ^F	40,237 ^G	41,984 ^H	42,014 ^I
Total, Training Programs	\$39,107	\$39,506	\$43,999^A	\$45,365^B	\$46,267^C	\$43,388^D	\$47,284^E	\$47,071^F	\$47,504^G	\$48,832^H	\$49,574^I

* Stipend increase occurred in FY 1989 and 1991.

^A Excludes assessment of \$ 444,740.

^B Excludes assessment of \$ 405,800.

^C Excludes assessment of \$ 466,000.

^D Excludes assessment of \$ 888,000.

^E Excludes assessment of \$ 864,000.

^F Excludes assessment of \$ 964,000.

^G Excludes assessment of \$ 982,000.

^H Excludes assessment of \$1,004,000.

^I Excludes assessment of \$1,032,000.

Full-Time Training Positions* by Activity: Fiscal Years 1988-98

	(Number of Positions)										
	1988	1989	1990	1991	Fiscal Year		1994	1995	1996	1997	1998
					1992	1993					
Fellowship Programs											
Predocctoral Fellowship Award for Minority Students (F31)	—	—	—	—	3	4	7	13	21	15	19
Individual NRSA (F32)	210	184	206	191	209	200	229	222	220	210	225
Senior Fellowships NRSA (F33)	1	3	5	6	4	4	4	4	7	5	4
Minority Access to Research Careers (MARC) Fellowships NRSA (F34)	2	—	—	—	—	—	—	—	—	—	—
Intramural NRSA (F35)	5	1	3	4	5	3	2	2	—	—	—
Subtotal, Fellowships	218	188	214	201	221	211	242	241	248	230	248
Graduate Training Programs											
Institutional NRSA (T32)	1,278	1,257	1,205	1,218	1,240	1,124	1,237	1,201	1,216	1,179	1,423
Minority Institutional NRSA (T32)	18	30	21	19	24	1	30	47	30	43	52
Minority Summer Hypertension NRSA (T34, T35)	6	5	—	—	—	—	—	—	—	—	—
Minority Summer Pulmonary NRSA (T34, T35)	3	—	—	—	—	—	—	—	—	—	—
Off-Quarter Professional Student Training NRSA (T34, T35)	132	148	79	103	102	181	100	76	78	68	—
Minority Access to Research Careers (MARC) (T36)	—	—	—	(4)	(4)	(4)	(2)	(2)	(2)	(2)	—
Short-Term Training for Minority Students (T35M)	—	—	—	26	53	40	102	125	113	75	—
Subtotal, Training Grants	1,437	1,440	1,305	1,366	1,419	1,346	1,469	1,449	1,437	1,365	1,475
Total, Training Programs	1,655	1,628	1,519	1,567	1,640	1,557	1,711	1,690	1,685	1,595	1,723

* Recommended positions.

NHLBI Research Career Programs: Fiscal Years 1988-98

Program	(Number of Awards)										
	1988	1989	1990	1991	1992	Fiscal Year		1995	1996	1997	1998
						1993	1994				
Mentored Research Development Award for Minority Faculty (K01)	—	—	—	—	—	—	—	—	—	5	19
Minority Institution Faculty Mentored Research Scientist Award (K01)	—	—	—	—	—	—	—	—	—	1	—
Research Scientist Development Award (K02)	—	—	—	—	—	—	—	—	3	8	14
Research Career Development Award (K04)	103	92	74	65	50	40	34	30	25	18	10
Research Career Award (K06)	11	11	9	8	7	6	3	3	3	3	3
Preventive Cardiology Academic Award (K07)	20	22	22	23	18	14	11	7	—	—	—
Preventive Pulmonary Academic Award (K07)	8	12	16	20	14	11	8	4	—	—	—
Transfusion Medicine Academic Award (K07)	23	20	18	18	14	12	9	5	2	—	—
Systemic Pulmonary and Vascular Diseases Academic Award (K07)	—	—	—	2	6	11	11	15	11	9	3
Asthma Academic Award (K07)	—	—	—	—	—	3	6	9	9	9	6
Tuberculosis Academic Award (K07)	—	—	—	—	—	6	12	15	19	23	20
Sleep Academic Award (K07)	—	—	—	—	—	—	—	—	8	12	20
Nutrition Academic Award (K07)	—	—	—	—	—	—	—	—	—	—	10
Clinical Investigator Award (K08)	1146	135	141	137	152	180	208	222	254	267	278
Physician Scientist Award (K11)	74	77	90	82	79	60	46	22	12	—	—
Minority School Faculty Development Award (K14)	21	22	22	18	18	15	12	11	15	9	—
Research Development Award for Minority Faculty (K14)	—	—	—	—	—	—	13	28	36	34	37
Total	406	391	392	373	358	358	373	371	397	398	420

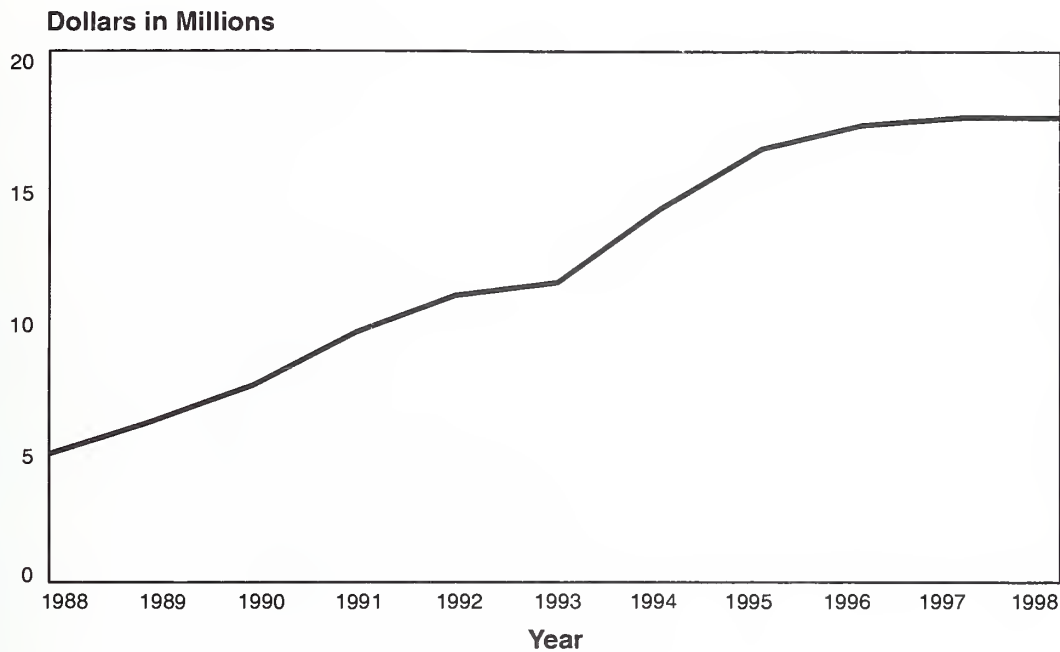
NHLBI Research Career Programs Obligations: Fiscal Years 1988-98

(Dollars in Thousands)

Program	Fiscal Year										
	1988	1989	1990	1991*	1992	1993	1994	1995	1996	1997	1998
Mentored Research Development Award for Minority Faculty (K01)	\$ —	\$ —	\$ —	\$ —	\$ —	\$ —	\$ —	\$ —	\$ —	\$ 460	\$1,824
Minority Institution Faculty Mentored Research Scientist Award (K01)	—	—	—	—	—	—	—	—	—	106	—
Research Scientist Development Award (K02)	—	—	—	—	—	—	—	—	207	545	933
Research Career Development Award (K04)	5,376	4,859	4,609	4,279	3,221	2,595	2,224	2,006	1,693	1,226	684
Research Career Award (K06)	364	331	303	270	239	194	102	104	105	103	103
Preventive Cardiology Academic Award (K07)	2,303	2,618	2,526	2,921	2,376	1,801	1,397	957	—	—	—
Preventive Pulmonary Academic Award (K07)	663	984	1,301	1,851	1,332	1,040	726	309	—	—	—
Transfusion Medicine Academic Award (K07)	1,916	1,719	1,590	1,658	1,452	1,155	868	485	326	—	—
Systemic Pulmonary and Vascular Diseases Academic Award (K07)	—	—	—	242	894	1,820	1,863	2,295	1,715	1,415	386
Asthma Academic Award (K07)	—	—	—	—	—	233	502	749	740	764	509
Tuberculosis Academic Award (K07)	—	—	—	—	—	454	906	1,155	1,496	1,831	1,566
Sleep Academic Award (K07)	—	—	—	—	—	—	—	—	699	1,027	1,734
Nutrition Academic Award (K07)	—	—	—	—	—	—	—	—	—	—	1,491
Clinical Investigator Award (K08)	8,913	8,445	8,860	10,370	11,733	14,125	16,635	18,090	21,093	22,238	23,122
Physician Scientist Award (K11)	5,146	5,328	6,376	6,651	6,598	5,110	3,993	1,903	1,023	0	—
Minority School Faculty Development Award (K14)	1,256	1,280	1,334	1,226	1,265	1,081	893	810	1,158	729	618
Research Development Award for Minority Faculty (K14)	—	—	—	—	—	—	1,289	2,812	3,607	3,468	3,099
Total	\$25,937	\$25,564	\$26,899	\$29,468	\$29,110	\$29,608	\$31,398	\$31,675	\$33,862	\$33,912	\$36,069

* Salary ceiling on Research Career Awards increased from \$40,000 to \$50,000.

NHLBI Minority Biomedical Research Training, Career Development, and Research Supplements Program Obligations: Fiscal Years 1988-98



NHLBI Minority Biomedical Research Training, Career Development, and Research Supplements Program Obligations: Fiscal Years 1988-98

(Dollars in Thousands)

Program	Fiscal Year											
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	
Minority Biomedical Research Support (MBRS)	\$2,416	\$2,368	\$2,418	\$2,561	\$2,672	\$2,540	\$2,433	\$2,313	\$2,503	\$2,722	\$2,978	
Minority Access to Research Careers (MARC)	67	23	19	—	—	—	—	—	5	5	5	
Minority Hypertension Research Development Summer Program	126	80	—	—	—	—	—	—	—	—	—	
Minority Pulmonary Research Development Summer Program	25	—	—	—	—	—	—	—	—	—	—	
Minority Institutional Research Training Program	288	348	398	567	684	608	735	982	679	898	706	
Minority School Faculty Development Award	1,256	1,280	1,334	1,226	1,265	1,081	893	810	1,158	729	618	
Research Development Award for Minority Faculty	—	—	—	—	—	—	1,289	2,812	3,607	3,468	3,099	
Minority Research Supplements Programs	485	1,763	3,059	4,596	5,367	6,273	6,754	7,264	6,714	7,021	7,043	
Reentry Supplements	—	—	—	—	—	—	—	—	140	89	249	
MARC Summer Research Training Program	—	25	34	32	20	48	31	28	32	17	0	
Short-Term Training for Minority Students	—	—	—	339	717	573	1,616	1,760	1,834	1,612	1,964	
Minority Predoctoral Fellowship	—	—	—	—	55	114	199	304	551	388	436	
Mentored Research Development Award for Minority Faculty	—	—	—	—	—	—	—	—	—	460	376	
Minority Institutional Faculty Mentored Research Scientist Award	—	—	—	—	—	—	—	—	—	106	101	
Total Minority Programs	\$4,663	\$5,887	\$7,262	\$9,321	\$10,780	\$11,237	\$13,950	\$16,273	\$17,223	\$17,515	\$17,575	

NHLBI Research Supplements Program for Underrepresented Minorities by Award Type: Fiscal Years 1988-98

(Number of Awards)

Award Type	Fiscal Year										
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Investigator	12	33	50	54	45	51	46	49	42	38	31
Postdoctoral	—	—	—	9	25	29	31	39	49	47	50
Graduate	—	6	16	24	37	45	55	42	37	36	48
Undergraduate	—	4	11	16	22	20	35	27	12	23	25
High School	—	—	—	2	1	5	15	10	8	9	11
Reentry Supplements	—	—	—	—	—	—	—	—	2	2	3
Total	12	43	77	105	130	150	182	167	150	155	168

NHLBI Research Supplements Program Obligations for Underrepresented Minorities by Award Type: Fiscal Years 1988-98

(Dollars in Thousands)

Award Type	Fiscal Year										
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Investigator	\$485	\$1,626	\$2,749	\$3,449	\$2,959	\$3,270	\$2,894	\$3,319	\$2,552	\$2,412	\$2,185
Postdoctoral*	—	—	—	478	1,392	1,574	1,882	2,153	2,899	3,172	3,032
Graduate†	—	99	255	501	843	1,263	1,585	1,402	1,116	1,181	1,527
Undergraduate†	—	19	55	162	171	150	332	351	120	273	246
High School*	—	—	—	6	3	16	61	40	27	32	53
Reentry Supplements	—	—	—	—	—	—	—	—	140	152	249
Total	\$485	\$1,744	\$3,059	\$4,596	\$5,368	\$6,273	\$6,754	\$7,265	\$6,854	\$7,221	\$7,292

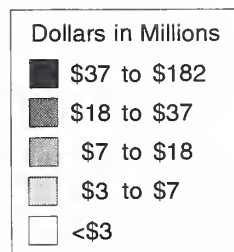
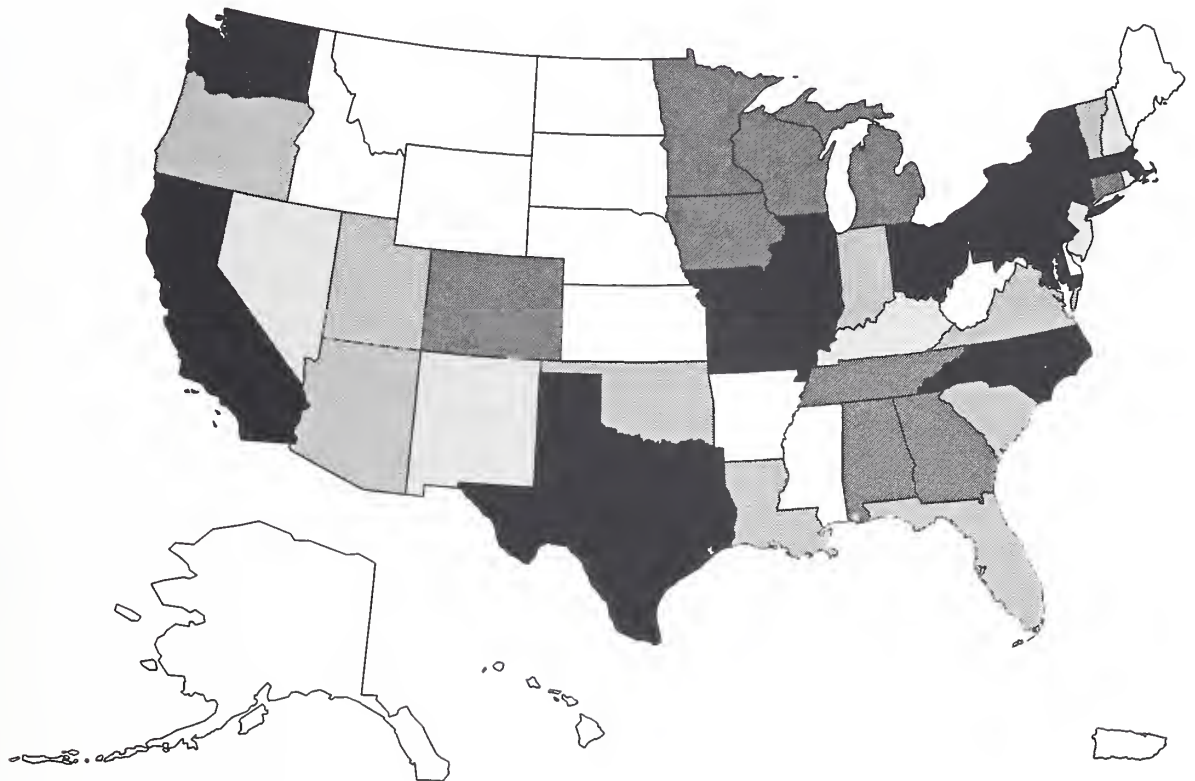
* Implemented in FY 1991.

† Implemented in FY 1989.



13. Geographic Distribution of Awards: Fiscal Year 1998

Geographic Distribution of Awards by State:
Fiscal Year 1998



Geographic Distribution of Awards by State or Country: Fiscal Year 1998

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
Alabama								
Alabama State University	0	\$ 79,971	0	\$ 79,971	0	\$ 0	0	\$ 0
Computational Fluid Dynamics Research Corporation	1	365,582	1	365,582	0	0	0	0
University of Alabama at Birmingham	74	20,607,313	59	14,920,160	8	955,214	7	4,731,939
University of Alabama in Huntsville	1	163,278	1	163,278	0	0	0	0
University of South Alabama . .	15	3,686,490	15	3,686,490	0	0	0	0
Total, Alabama	91	24,902,634	76	19,215,481	8	955,214	7	4,731,939
Arizona								
Gila River Indian Community Council	1	504,202	1	504,202	0	0	0	0
IMARX Pharmaceutical Corporation	1	100,000	1	100,000	0	0	0	0
Materials and Electrochemical Research	1	371,142	1	371,142	0	0	0	0
St. Joseph's Hospital/Medical Center	1	32,942	1	32,942	0	0	0	0
University of Arizona	25	6,312,597	20	4,433,921	4	401,704	1	1,476,972
Total, Arizona	29	7,320,883	24	5,442,207	4	401,704	1	1,476,972
Arkansas								
Arkansas Children's Hospital .	1	124,214	1	124,214	0	0	0	0
University of Arkansas at Pine Bluff	1	97,270	1	97,270	0	0	0	0
University of Arkansas Medical Sciences, Little Rock	2	355,780	2	355,780	0	0	0	0
Total, Arkansas	4	577,264	4	577,264	0	0	0	0
California								
Anatomix	1	433,720	1	433,720	0	0	0	0
Beckman Research Institute . . .	1	271,058	1	271,058	0	0	0	0
Berkeley Applied Science and Engineering	1	99,250	1	99,250	0	0	0	0
Bio Micronics, Inc.	1	99,970	1	99,970	0	0	0	0
Biomarin Pharmaceutical, Inc. .	1	100,000	1	100,000	0	0	0	0
Burnham Institute	2	665,100	2	665,100	0	0	0	0
California Institute of Technology	1	294,741	1	294,741	0	0	0	0
California State Polytechnic University	1	142,293	1	142,293	0	0	0	0
California State University, Los Angeles	0	95,470	0	95,470	0	0	0	0
Cardiomend, LLC	1	100,000	1	100,000	0	0	0	0
Cedars-Sinai Medical Center . .	7	1,188,503	6	1,049,032	0	0	1	139,471
Cerus Corporation	2	729,602	2	729,602	0	0	0	0

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
California (continued)								
Charles R. Drew University of Medicine and Science.	1	210,663	0	0	1	210,663	0	0
Chemistry Solutions	1	99,708	1	99,708	0	0	0	0
Children's Hospital Medical Center Northern California, Oakland.	6	1,109,234	4	966,673	1	37,192	1	105,369
Children's Hospital of Los Angeles.	6	3,385,563	6	3,385,563	0	0	0	0
Children's Hospital of Orange County.	3	406,816	1	219,000	0	0	2	187,816
City of Hope National Medical Center	1	587,929	1	587,929	0	0	0	0
Clarigen, Inc.	1	100,000	1	100,000	0	0	0	0
COR Therapeutics, Inc.	1	100,000	1	100,000	0	0	0	0
Cypros Pharmaceutical Corporation.	1	100,000	1	100,000	0	0	0	0
Gen-Probe, Inc.	1	3,951,044	0	0	0	0	1	3,951,044
Genelabs Technologies, Inc.	1	101,458	1	101,458	0	0	0	0
Harbor-UCLA Research and Educational Institute	9	2,443,066	8	1,743,092	0	0	1	699,974
Health Promotion Services, Inc.	1	226,626	1	226,626	0	0	0	0
Immusol, Inc.	1	99,993	1	99,993	0	0	0	0
Innerspace Medical, Inc.	1	99,758	1	99,758	0	0	0	0
Institute of Critical Care Medicine	1	155,454	1	155,454	0	0	0	0
Irwin Memorial Blood Centers	1	677,063	0	0	0	0	1	677,063
J. David Gladstone Institutes . .	12	5,796,699	10	5,734,687	2	62,012	0	0
Kaiser Foundation Hospitals . .	2	742,236	2	742,236	0	0	0	0
Kaiser Foundation Research Institute.	6	3,224,696	6	3,224,696	0	0	0	0
Kaiser Foundation Research Institute.	3	1,929,786	0	0	0	0	3	1,929,786
Loma Linda University	5	1,149,353	5	1,149,353	0	0	0	0
Maxia Pharmaceuticals, Inc. . .	1	94,846	1	94,846	0	0	0	0
Metrika Laboratories, Inc.	1	736,968	1	736,968	0	0	0	0
Mission Medical, Inc.	2	897,395	2	897,395	0	0	0	0
Mission Research Corporation.	1	367,102	1	367,102	0	0	0	0
Northern California Institute of Research and Education.	9	1,294,913	9	1,294,913	0	0	0	0
Oztech Systems, Inc.	1	99,845	1	99,845	0	0	0	0
Palo Alto Institute for Research and Education.	1	157,396	1	157,396	0	0	0	0
Palo Alto Medical Foundation Research Institute.	1	95,974	1	95,974	0	0	0	0
Panorama Research, Inc.	2	200,000	2	200,000	0	0	0	0
Public Health Foundation Enterprises	1	322,275	1	322,275	0	0	0	0
SACNAS	0	5,000	0	0	0	5,000	0	0

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
California (continued)								
Salk Institute for Biological Studies	3	661,681	2	631,521	1	30,160	0	0
San Diego State University . . .	8	3,977,237	8	3,977,237	0	0	0	0
SCIOS, Inc.	1	374,999	1	374,999	0	0	0	0
Scripps Research Institute	48	18,637,358	41	17,933,217	7	704,141	0	0
Sidney Kimmel Cancer Center	1	359,998	1	359,998	0	0	0	0
SRI International	1	322,370	1	322,370	0	0	0	0
Stanford University	50	15,766,056	39	13,010,496	8	797,647	3	1,957,913
Thoratec Laboratories Corporation.	1	249,870	1	249,870	0	0	0	0
Torrey Pines Institute/Molecular Studies.	1	256,001	1	256,001	0	0	0	0
U.S. Department of Veterans Affairs Medical Center, Palo Alto . . .	1	2,447,792	0	0	0	0	1	2,447,792
University of California, Lawrence Berkeley Laboratory.	11	5,732,376	10	5,601,216	1	131,160	0	0
University of California, Berkeley.	4	676,575	3	664,829	1	11,746	0	0
University of California, Davis	34	7,336,348	30	7,105,736	4	230,612	0	0
University of California, Irvine	11	2,559,017	8	1,676,650	1	17,696	2	864,671
University of California, Los Angeles.	47	20,630,657	41	16,506,226	1	259,564	5	3,864,867
University of California, Riverside	1	199,572	1	199,572	0	0	0	0
University of California, San Diego	76	28,397,256	55	24,743,218	19	2,080,353	2	1,573,685
University of California, San Francisco	82	28,420,317	67	26,262,418	12	1,519,841	3	638,058
University of California, Santa Barbara	2	366,622	2	366,622	0	0	0	0
University of Southern California	21	8,276,803	21	8,276,803	0	0	0	0
Veterans Medical Research Foundation, San Diego	3	522,290	3	522,290	0	0	0	0
Total, California.	511	181,359,761	426	156,224,465	59	6,097,787	26	19,037,509
Colorado								
AMC Cancer Research Center . . .	0	330,000	0	330,000	0	0	0	0
Colorado State University	3	356,929	2	336,141	1	20,788	0	0
Denver City-County Health and Hospitals Department	1	206,742	1	206,742	0	0	0	0
Keystone Symposia	2	20,000	2	20,000	0	0	0	0
National Jewish Medicine and Research Center	28	10,664,115	24	10,146,263	2	190,861	2	326,991
University of Colorado at Boulder	6	939,097	4	759,994	2	179,103	0	0

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
Colorado (continued)								
University of Colorado Health Sciences Center	38	11,286,286	33	10,282,991	4	719,318	1	283,977
Total, Colorado	78	23,803,169	66	22,082,131	9	1,110,070	3	610,968
Connecticut								
Electro Energy, Inc.	1	374,873	1	374,873	0	0	0	0
Genaissance Pharmaceuticals, Inc.	1	355,409	1	355,409	0	0	0	0
Hartford Hospital	1	370,839	0	0	0	0	1	370,839
John B. Pierce Laboratory, Inc.	5	1,044,259	5	1,044,259	0	0	0	0
MGS Research, Inc.	1	114,974	1	114,974	0	0	0	0
Symbiotech, Inc.	2	453,667	2	453,667	0	0	0	0
University of Connecticut Health Center	6	1,235,005	6	1,235,005	0	0	0	0
Yale University	56	14,668,479	47	13,494,039	8	888,219	1	286,221
Total, Connecticut	73	18,617,505	63	17,072,226	8	888,219	2	657,060
Delaware								
Compact Membrane Systems, Inc.	1	379,020	1	379,020	0	0	0	0
University of Delaware	3	381,192	3	381,192	0	0	0	0
Total, Delaware	4	760,212	4	760,212	0	0	0	0
District of Columbia								
American National Red Cross	16	5,327,367	13	4,213,742	2	186,418	1	927,207
American Registry of Pathology, Inc.	1	180,000	1	180,000	0	0	0	0
Carnegie Institution of Washington, D.C.	0	22,660	0	22,660	0	0	0	0
Children's National Medical Center	1	318,077	1	318,077	0	0	0	0
Children's Research Institute	1	330,527	1	330,527	0	0	0	0
George Washington University	4	4,393,299	1	253,947	0	0	3	4,139,352
Georgetown University	18	3,816,825	15	3,517,915	1	30,160	2	268,750
Howard University	2	688,257	1	576,290	1	111,967	0	0
Medlantic Research Institute	4	3,248,349	2	1,607,904	0	0	2	1,640,445
Ogilvy Adams and Rinehart	1	1,251,761	0	0	0	0	1	1,251,761
U.S. Department of Agriculture	1	177,070	1	177,070	0	0	0	0
U.S. Department of Veterans Affairs Medical Center	1	130,194	0	0	0	0	1	130,194
U.S. National Aeronautics and Space Administration	1	20,000	0	0	0	0	1	20,000
Total, District of Columbia	51	19,904,386	36	11,198,132	4	328,545	11	8,377,709
Florida								
Bethune-Cookman College	0	163,867	0	163,867	0	0	0	0
Florida Agricultural and Mechanical University	0	286,866	0	286,866	0	0	0	0
Florida Atlantic University	1	250,133	1	250,133	0	0	0	0
Florida State University	1	200,900	1	200,900	0	0	0	0
Mt. Sinai Medical Center, Miami Beach	3	1,176,179	3	1,176,179	0	0	0	0

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
Florida (continued)								
Optix, Inc.	1	258,960	1	258,960	0	0	0	0
Schwartz Electro-Optics, Inc. . .	1	279,682	1	279,682	0	0	0	0
University of Florida	25	8,505,272	22	6,489,995	1	74,521	2	1,940,756
University of Miami	11	2,740,097	9	2,000,522	1	264,994	1	474,581
University of Miami, Coral Gables	4	3,025,642	2	1,925,496	1	100,102	1	1,000,044
University of South Florida . . .	4	657,020	4	657,020	0	0	0	0
Total, Florida	51	17,544,618	44	13,689,620	3	439,617	4	3,415,381
Georgia								
Clark Atlanta University	1	83,055	1	83,055	0	0	0	0
Cryolife, Inc.	1	500,525	1	500,525	0	0	0	0
Emory University	52	11,701,372	43	10,209,473	8	526,411	1	965,488
Georgia Institute of Technology	2	320,026	2	320,026	0	0	0	0
Georgia State University	1	202,599	1	202,599	0	0	0	0
Medical College of Georgia . . .	14	5,968,079	14	5,968,079	0	0	0	0
Morehouse School of Medicine	0	649,432	0	649,432	0	0	0	0
Savannah State College	1	92,992	1	92,992	0	0	0	0
U.S. Centers for Disease Control and Prevention	2	860,000	0	0	0	0	2	860,000
University of Georgia	2	416,120	2	380,108	0	36,012	0	0
Total, Georgia	76	20,794,200	65	18,406,289	8	562,423	3	1,825,488
Hawaii								
Kuakini Medical Center	1	387,021	1	387,021	0	0	0	0
University of Hawaii at Hilo . . .	0	161,159	0	161,159	0	0	0	0
University of Hawaii at Manoa	3	1,560,718	2	460,718	0	0	1	1,100,000
Total, Hawaii	4	2,108,898	3	1,008,898	0	0	1	1,100,000
Illinois								
Biomedical Acoustics								
Research Company.	1	99,915	1	99,915	0	0	0	0
Critical Concepts, Inc.	1	385,033	1	385,033	0	0	0	0
Finch University of Health Sciences/Chicago Medical School								
Haemoscope Corporation	1	100,000	1	100,000	0	0	0	0
Humana Hospital-Michael Reese	3	429,218	2	396,394	1	32,824	0	0
Lidon Technologies, LLC	2	199,864	2	199,864	0	0	0	0
Life Resuscitation Technologies, Inc.	1	77,500	1	77,500	0	0	0	0
Loyola University								
Medical Center	21	3,595,493	19	3,538,825	2	56,668	0	0
Magnetic Resonance								
Microsensors Corporation	1	348,508	1	348,508	0	0	0	0
Myochlor	1	100,000	1	100,000	0	0	0	0
Northern Illinois University. . . .	1	70,548	1	70,548	0	0	0	0
Northwestern University,								
Evanston	23	7,795,223	20	5,451,701	1	26,176	2	2,317,346

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
Illinois (continued)								
Northwestern University, Chicago	7	1,593,944	5	1,374,871	2	219,073	0	0
Rush-Presbyterian-St. Luke's Medical Center	11	4,342,133	9	1,946,528	0	13,433	2	2,382,172
Southern Illinois University School of Medicine	2	201,941	2	201,941	0	0	0	0
U.S. Department of Veterans Affairs Medical Center, Hines	1	126,851	1	126,851	0	0	0	0
University of Chicago	39	12,570,012	33	11,406,469	6	1,163,543	0	0
University of Illinois at Chicago	32	8,217,679	29	7,550,092	2	575,804	1	91,783
University of Illinois at Urbana-Champaign	7	1,723,855	7	1,723,855	0	0	0	0
Total, Illinois	156	42,158,413	137	35,279,591	14	2,087,521	5	4,791,301
Indiana								
Indiana University/Purdue University at Indianapolis	49	12,832,963	44	12,378,664	4	437,605	1	16,694
Indiana University at Bloomington	2	181,050	2	181,050	0	0	0	0
Methodist Research Institute	1	23,548	0	0	1	23,548	0	0
Micronix	1	283,721	1	283,721	0	0	0	0
Northeastern Mental Health Center	1	214,578	1	214,578	0	0	0	0
Purdue University, West Lafayette	5	643,767	4	612,275	1	31,492	0	0
University of Notre Dame	2	690,375	2	690,375	0	0	0	0
Total, Indiana	61	14,870,002	54	14,360,663	6	492,645	1	16,694
Iowa								
Maharishi University of Management	2	790,611	2	790,611	0	0	0	0
University of Iowa	59	19,572,214	45	15,861,718	11	1,486,948	3	2,223,548
Total, Iowa	61	20,362,825	47	16,652,329	11	1,486,948	3	2,223,548
Kansas								
Kansas State University	6	767,471	5	733,327	1	34,144	0	0
University of Kansas, Lawrence	2	674,871	2	674,871	0	0	0	0
University of Kansas Medical Center	1	172,321	1	172,321	0	0	0	0
Wichita State University	1	134,712	1	134,712	0	0	0	0
Total, Kansas	10	1,749,375	9	1,715,231	1	34,144	0	0
Kentucky								
University of Kentucky	21	4,262,436	18	3,559,833	2	30,773	1	671,830
University of Louisville	6	1,029,107	5	1,011,219	1	17,888	0	0
Total, Kentucky	27	5,291,543	23	4,571,052	3	48,661	1	671,830

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
Louisiana								
Louisiana State University								
Medical Center, New Orleans	10	1,775,597	10	1,775,597	0	0	0	0
Louisiana State University								
Medical Center, Shreveport . .	2	403,407	2	403,407	0	0	0	0
Pennington Biomedical Research								
Center	3	1,432,141	3	1,432,141	0	0	0	0
Tulane University of Louisiana	23	4,349,365	21	4,276,198	2	73,167	0	0
Total, Louisiana	38	7,960,510	36	7,887,343	2	73,167	0	0
Maine								
Jackson Laboratory	6	1,691,633	6	1,691,633	0	0	0	0
Maine Medical Center	2	444,128	2	444,128	0	0	0	0
Sensor Research and Development								
Corporation	1	303,037	1	303,037	0	0	0	0
University of New England . . .	1	181,193	1	181,193	0	0	0	0
Total, Maine	10	2,619,991	10	2,619,991	0	0	0	0
Maryland								
American Type Culture								
Collection	1	150,073	0	0	0	0	1	150,073
Biotech Research Laboratories .	2	748,515	1	370,680	0	0	1	377,835
Cardiologic Systems, Inc.	1	350,000	1	350,000	0	0	0	0
Clinical Trials and Surveys								
Corporation	1	461,334	0	0	0	0	1	461,334
Compact Disc, Inc.	1	286,829	1	286,829	0	0	0	0
Cyber Technology, Inc.	1	99,430	1	99,430	0	0	0	0
Defense Research								
Technologies, Inc.	1	385,769	1	385,769	0	0	0	0
DVP, Inc.	1	388,171	1	388,171	0	0	0	0
Emmes Corporation	2	1,528,036	0	0	0	0	2	1,528,036
Federation of American Societies								
for Experimental Biology	0	5,000	0	5,000	0	0	0	0
Genome Dynamics, Inc.	1	99,998	0	0	0	0	1	99,998
Henry M. Jackson Foundation								
for the Advancement of								
Military Medicine	3	880,744	3	880,744	0	0	0	0
Institute for Genomic Research	1	209,421	1	209,421	0	0	0	0
Johns Hopkins University	134	36,344,365	113	31,612,680	15	2,543,197	6	2,188,488
Lion Pharmaceuticals, Inc.	1	99,771	1	99,771	0	0	0	0
Maryland Biotechnology								
Institute	1	293,250	1	293,250	0	0	0	0
Maryland Medical Research								
Institute	2	1,472,422	1	997,838	0	0	1	474,584
Molecular Tool, Inc.	1	318,891	1	318,891	0	0	0	0
National Heart Institute	0	12,168,000	0	0	0	0	0	12,168,000
National Tuberos Sclerosis								
Association	0	5,000	0	5,000	0	0	0	0
Peace Technology, Inc.	1	1,491,925	0	0	0	0	1	1,491,925
Polychip, Inc.	1	98,999	1	98,999	0	0	0	0
Prospect Associates, Ltd.	1	1,046,931	0	0	0	0	1	1,046,931

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
Maryland (continued)								
Quality Biological, Inc.	2	757,508	2	757,508	0	0	0	0
Robin Medical, Inc.	1	100,000	1	100,000	0	0	0	0
ROW Sciences, Inc.	1	1,170,907	0	0	0	0	1	1,170,907
Rubicon Laboratory, Inc.	1	100,000	1	100,000	0	0	0	0
U.S. Agricultural Research Center	2	610,000	0	0	0	0	2	610,000
U.S. Bureau of the Census	1	300,000	0	0	0	0	1	300,000
U.S. Department of Veterans Affairs Medical Center, Baltimore.	1	40,000	0	0	0	0	1	40,000
U.S. Fogarty International Center	1	50,000	0	0	0	0	1	50,000
U.S. National Center for Health Statistics	2	177,000	0	0	0	0	2	177,000
U.S. National Center/Research Resources	1	345,565	0	0	0	0	1	345,565
U.S. National Institute of Allergy and Infectious Diseases.	1	89,022	0	0	0	0	1	89,022
U.S. Naval Medical Research Institute.	1	57,600	0	0	0	0	1	57,600
U.S. PHS Indian Health Service Supply Service	1	53,399	0	0	0	0	1	53,399
U.S. PHS Public Advisory Groups.	1	1,456,000	1	1,456,000	0	0	0	0
University of Maryland Baltimore Professional School	27	6,752,972	21	6,178,121	4	191,999	2	382,852
Westat, Inc.	1	352,147	1	352,147	0	0	0	0
Total, Maryland	203	71,344,994	155	45,346,249	19	2,735,196	29	23,263,549
Massachusetts								
Abiomed, Inc.	3	2,478,082	2	707,204	0	0	1	1,770,878
Beth Israel Deaconess Medical Center	57	18,084,940	51	17,692,809	5	277,439	1	114,692
Biopure Corporation.	1	99,712	1	99,712	0	0	0	0
Boston Biomedical Research Institute.	5	1,108,274	4	1,083,274	1	25,000	0	0
Boston Biotechnology Corporation.	1	31,824	0	0	1	31,824	0	0
Boston Medical Center	12	5,261,876	10	5,190,720	2	71,156	0	0
Boston University	59	29,372,690	53	23,060,491	5	1,462,024	1	4,850,175
Brandeis University	0	29,134	0	29,134	0	0	0	0
Brigham and Women's Hospital	112	41,958,472	91	38,652,505	19	2,062,255	2	1,243,712
Cardiotech International, Inc. . .	2	575,704	2	575,704	0	0	0	0
Center for Blood Research	11	9,118,374	10	9,081,362	1	37,012	0	0
Children's Hospital, Boston	39	9,865,283	32	9,127,921	6	601,117	1	136,245
Covalent Associates, Inc.	1	407,251	1	407,251	0	0	0	0
Dana-Farber Cancer Institute. . . .	12	2,826,350	11	2,793,556	0	0	1	32,794
E. Benson Hood Laboratories, Inc.	1	349,384	1	349,384	0	0	0	0
Egan Design Services	1	441,810	1	441,810	0	0	0	0

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
Massachusetts (continued)								
Engineering Partnership, Ltd. . .	1	370,175	1	370,175	0	0	0	0
Foster-Miller, Inc.	2	434,215	2	434,215	0	0	0	0
Giner, Inc.	1	376,194	1	376,194	0	0	0	0
Gwathmey, Inc.	1	100,000	1	100,000	0	0	0	0
Harvard University.	2	295,455	1	262,311	1	33,144	0	0
Harvard University.	47	10,913,559	36	9,816,576	11	1,096,983	0	0
Hebrew Rehabilitation Center for the Aged	1	253,998	1	253,998	0	0	0	0
Innovative Chemical and Environmental Technology . .	2	466,034	2	466,034	0	0	0	0
Ionoptix Corporation	1	100,000	1	100,000	0	0	0	0
Leukosite, Inc.	1	288,878	1	288,878	0	0	0	0
Massachusetts General Hospital	57	16,819,685	53	14,555,900	3	518,175	1	1,745,610
Massachusetts Institute of Technology	11	4,378,067	7	4,266,239	4	111,828	0	0
New England Medical Center	16	3,036,784	14	2,852,564	2	184,220	0	0
New England Research Institutes, Inc.	11	4,873,670	9	2,961,160	0	0	2	1,912,510
Pentose Pharmaceuticals, Inc. .	1	99,500	1	99,500	0	0	0	0
Physical Sciences, Inc.	1	99,994	1	99,994	0	0	0	0
Radiation Monitoring Devices, Inc.	1	378,425	1	378,425	0	0	0	0
Rare Earth Medical, Inc.	1	367,940	1	367,940	0	0	0	0
Science Research Laboratory, Inc.	1	420,598	1	420,598	0	0	0	0
Sound Medical Solutions	1	78,842	1	78,842	0	0	0	0
St. Elizabeth's Medical Center of Boston.	9	2,242,812	9	2,242,812	0	0	0	0
T Cell Sciences, Inc.	2	401,177	2	401,177	0	0	0	0
Thermal Technologies, Inc. . . .	2	200,000	2	200,000	0	0	0	0
Tufts University, Boston	12	2,305,281	10	2,215,475	2	89,806	0	0
University of Massachusetts, Lowell	1	173,678	1	173,678	0	0	0	0
University of Massachusetts Medical School	16	5,708,385	13	4,532,077	2	176,308	1	1,000,000
Whalen Biomedical, Inc.	1	98,360	1	98,360	0	0	0	0
Whitehead Institute for Biomedical Research	4	276,817	2	225,465	2	51,352	0	0
Worcester Polytechnic Institute	1	100,656	1	100,656	0	0	0	0
Total, Massachusetts	525	177,668,339	447	158,032,080	67	6,829,643	11	12,806,616
Michigan								
Aastrom Biosciences, Inc.	1	375,003	1	375,003	0	0	0	0
American National Red Cross, Southeast Michigan	1	889,011	0	0	0	0	1	889,011
Case Western Reserve University, Henry Ford Health Sciences Center.	9	3,209,727	8	2,992,860	0	0	1	216,867
Michigan Critical Care Consultants, Inc.	2	431,819	2	431,819	0	0	0	0
Michigan State University	12	2,060,827	12	2,060,827	0	0	0	0

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
Michigan (continued)								
Nephros Therapeutics, Inc. . . .	1	100,000	1	100,000	0	0	0	0
Selective Technologies, Inc. . . .	1	98,721	1	98,721	0	0	0	0
Thromgen, Inc.	2	471,965	2	471,965	0	0	0	0
University of Michigan at Ann Arbor.	80	24,292,694	68	22,094,741	9	1,204,236	3	993,717
Wayne State University	19	4,656,695	17	3,753,023	1	26,322	1	877,350
Western Michigan University . . .	1	133,048	1	133,048	0	0	0	0
Total, Michigan	129	36,719,510	113	32,512,007	10	1,230,558	6	2,976,945
Minnesota								
Advanced Medical Electronics Corporation.	1	371,727	1	371,727	0	0	0	0
Angeion Corporation	1	99,664	1	99,664	0	0	0	0
Brimson Laboratories	1	405,424	1	405,424	0	0	0	0
Data Sciences International, Inc.	1	237,502	1	237,502	0	0	0	0
Intratherapeutics, Inc.	1	100,000	1	100,000	0	0	0	0
Mayo Foundation	42	8,893,319	34	8,337,408	7	449,559	1	106,352
Minneapolis Medical Research Foundation, Inc.	2	140,417	2	140,417	0	0	0	0
Surmodics, Inc.	1	371,650	1	371,650	0	0	0	0
University of Minnesota, Twin Cities	69	20,938,632	59	17,653,024	4	395,774	6	2,889,834
Total, Minnesota	119	31,558,335	101	27,716,816	11	845,333	7	2,996,186
Mississippi								
Jackson State University.	1	158,610	0	0	1	158,610	0	0
University of Mississippi Medical Center	8	1,824,222	5	724,700	2	58,676	1	1,040,846
Total, Mississippi	9	1,982,832	5	724,700	3	217,286	1	1,040,846
Missouri								
Barnes-Jewish Hospital	18	4,838,482	17	4,802,470	1	36,012	0	0
Children's Mercy Hospital, Kansas City	1	212,892	1	212,892	0	0	0	0
Reliable Biopharmaceutical Corporation.	1	267,605	1	267,605	0	0	0	0
St. Louis University	17	3,453,379	16	3,338,399	0	0	1	114,980
University of Missouri, Columbia.	24	4,680,118	22	4,571,315	2	108,803	0	0
University of Missouri, Kansas City.	2	265,373	2	265,373	0	0	0	0
Washington University.	101	27,311,888	87	24,885,275	12	1,643,236	2	783,377
Total, Missouri.	164	41,029,737	146	38,343,329	15	1,788,051	3	898,357
Montana								
McLaughlin Research Institute for Biomedical Sciences	1	309,080	1	309,080	0	0	0	0
Total, Montana.	1	309,080	1	309,080	0	0	0	0

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
Nebraska								
Creighton University	1	38,871	0	0	1	38,871	0	0
University of Nebraska, Lincoln.	1	208,910	1	208,910	0	0	0	0
University of Nebraska Medical Center	11	1,572,140	10	1,525,207	1	46,933	0	0
Total, Nebraska	13	1,819,921	11	1,734,117	2	85,804	0	0
Nevada								
Sierra Biomedical Research Corporation.	3	696,845	3	696,845	0	0	0	0
University of Nevada at Reno .	9	2,782,258	7	1,557,258	1	25,000	1	1,200,000
Total, Nevada	12	3,479,103	10	2,254,103	1	25,000	1	1,200,000
New Hampshire								
Creare, Inc.	2	410,169	2	410,169	0	0	0	0
Dartmouth College	15	3,052,991	12	2,823,670	3	229,321	0	0
Diatide, Inc.	1	226,882	1	226,882	0	0	0	0
University of New Hampshire	1	99,420	1	99,420	0	0	0	0
Total, New Hampshire	19	3,789,462	16	3,560,141	3	229,321	0	0
New Jersey								
Menssana Research, Inc.	1	100,000	1	100,000	0	0	0	0
Palatin Technologies, Inc.	1	99,329	1	99,329	0	0	0	0
Princeton University.	1	278,250	1	278,250	0	0	0	0
Rutgers, The State University of New Jersey, New Brunswick .	1	180,919	1	180,919	0	0	0	0
Rutgers, The State University of New Jersey, Newark.	0	72,046	0	72,046	0	0	0	0
Synosys, Inc.	1	100,000	1	100,000	0	0	0	0
University of Medicine and Dentistry of New Jersey- R.W. Johnson Medical School	9	1,691,043	8	1,664,867	1	26,176	0	0
University of Medicine and Dentistry of New Jersey- School of Osteopathic Medicine	2	292,812	2	292,812	0	0	0	0
University of Medicine and Dentistry of New Jersey.	10	3,863,459	9	1,863,459	0	0	1	2,000,000
Total, New Jersey.	26	6,677,858	24	4,651,682	1	26,176	1	2,000,000
New Mexico								
Lovelace Biomedical and Environmental Research	1	121,338	1	121,338	0	0	0	0
New Mexico Highlands University	0	101,969	0	101,969	0	0	0	0
New Mexico State University, Las Cruces.	0	134,376	0	134,376	0	0	0	0
University of New Mexico, Albuquerque.	11	3,175,089	9	3,111,773	2	63,316	0	0
Total, New Mexico.	12	3,532,772	10	3,469,456	2	63,316	0	0

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
New York								
Aaron Diamond AIDS Research Center	1	330,000	1	330,000	0	0	0	0
Albany Medical College of Union University	8	1,279,115	6	952,591	2	326,524	0	0
AMBI, Inc.	1	100,000	1	100,000	0	0	0	0
Anatole J. Sipin Company, Inc.	1	227,319	1	227,319	0	0	0	0
Beth Israel Medical Center	1	213,168	1	213,168	0	0	0	0
Central New York Research Corporation.	1	230,983	1	230,983	0	0	0	0
Circulatory Technology, Inc.	1	277,344	1	277,344	0	0	0	0
City College of New York	1	221,387	1	221,387	0	0	0	0
Columbia Presbyterian Medical Center	1	128,990	0	0	0	0	1	128,990
Columbia University, New York Morningside	5	1,038,005	3	861,276	0	0	2	176,729
Columbia University Health Sciences	64	24,952,993	57	24,208,097	7	744,896	0	0
Conversion Energy Enterprises	1	99,782	1	99,782	0	0	0	0
Cornell University, Ithaca	3	580,499	2	560,791	1	19,708	0	0
Cornell University Medical Center	37	15,390,407	33	14,908,263	4	482,144	0	0
Genetica, Inc.	1	96,500	1	96,500	0	0	0	0
Health Science Center at Brooklyn	5	1,006,740	4	898,205	0	0	1	108,535
Health Science Center at Syracuse	6	2,524,876	6	2,524,876	0	0	0	0
Hypres, Inc.	1	316,693	1	316,693	0	0	0	0
Imageminds.	1	114,569	1	114,569	0	0	0	0
Institute for Basic Research in Developmental Disabilities	1	247,285	1	247,285	0	0	0	0
Interfaith Medical Center, Brooklyn	1	210,611	0	0	0	0	1	210,611
Lifelink Monitoring, Inc.	1	581,940	1	581,940	0	0	0	0
Masonic Medical Research Laboratory, Inc.	2	628,867	2	628,867	0	0	0	0
Mohawk Innovative Technology, Inc.	2	455,052	2	455,052	0	0	0	0
Montefiore Medical Center, Bronx	2	189,787	2	189,787	0	0	0	0
Mount Sinai School of Medicine of CUNY.	22	8,223,206	19	7,743,842	1	211,815	2	267,549
Narrows Institute for Biomedical Research, Inc.	1	151,882	1	151,882	0	0	0	0
National Hemophilia Foundation	1	10,000	1	10,000	0	0	0	0
New York Blood Center	4	1,806,886	4	1,806,886	0	0	0	0
New York Medical College	15	5,827,975	13	5,767,675	2	60,300	0	0
New York University Medical Center.	14	3,247,885	12	2,985,042	2	262,843	0	0
North Shore University Hospital	3	400,545	3	400,545	0	0	0	0

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
New York (continued)								
Nuzic, Inc.	1	94,991	1	94,991	0	0	0	0
Public Health Research Institute of the City of New York	2	563,058	2	563,058	0	0	0	0
Queens College	1	237,776	1	237,776	0	0	0	0
Radio Programmes Corporation	1	79,475	1	79,475	0	0	0	0
Riverside Research Institute . . .	1	103,800	1	103,800	0	0	0	0
Rockefeller University	6	3,635,438	6	3,635,438	0	0	0	0
Roswell Park Cancer Institute . . .	3	749,026	3	749,026	0	0	0	0
Sibtech, Inc	1	97,524	1	97,524	0	0	0	0
Sloan-Kettering Institute for Cancer Research	5	1,533,000	4	1,152,887	0	0	1	380,113
St. Luke's-Roosevelt Institute for Health Sciences	7	1,568,693	6	1,394,915	0	0	1	173,778
State University of New York at Stony Brook	17	4,107,652	16	3,576,706	0	0	1	530,946
State University of New York at Albany	1	187,462	1	187,462	0	0	0	0
State University of New York at Buffalo	9	3,412,023	7	1,884,646	1	79,877	1	1,447,500
Syracuse University at Syracuse	1	495,417	1	495,417	0	0	0	0
Trudeau Institute, Inc.	1	346,490	1	346,490	0	0	0	0
University of Rochester	26	10,137,060	24	9,804,969	2	332,091	0	0
Yeshiva University	20	11,595,145	16	8,874,985	3	242,756	1	2,477,404
Total, New York	312	110,055,321	275	101,390,212	25	2,762,954	12	5,902,155
North Carolina								
Axonal Information Solutions..	1	100,000	1	100,000	0	0	0	0
Data Spectrum Corporation . . .	1	360,956	1	360,956	0	0	0	0
Demeter Biotechnologies, Ltd..	1	98,515	1	98,515	0	0	0	0
Duke University	98	36,622,523	81	25,076,950	10	910,419	7	10,635,154
East Carolina University	5	834,719	5	834,719	0	0	0	0
Molichem-Magellan	0	28,500	0	28,500	0	0	0	0
North Carolina Agricultural and Technical State University	0	133,509	0	133,509	0	0	0	0
North Carolina State University at Raleigh	6	886,378	4	820,410	2	65,968	0	0
University of North Carolina at Chapel Hill	60	24,080,969	48	19,043,662	6	869,819	6	4,167,488
Wake Forest University	41	16,523,734	35	13,761,485	3	737,977	3	2,024,272
Total, North Carolina	213	79,669,803	176	60,258,706	21	2,584,183	16	16,826,914
North Dakota								
University of North Dakota	1	98,084	1	98,084	0	0	0	0
Total, North Dakota	1	98,084	1	98,084	0	0	0	0
Ohio								
Case Western Reserve University	67	20,369,413	59	19,580,046	7	756,254	1	33,113
Children's Hospital Medical Center, Cincinnati	31	9,780,949	29	9,671,754	2	109,195	0	0
Cleveland Clinic Foundation . . .	37	9,997,575	31	8,483,772	3	83,584	3	1,430,219

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
Ohio (continued)								
Gliatech, Inc.	1	97,516	1	97,516	0	0	0	0
Inotek, Inc.	3	291,421	3	291,421	0	0	0	0
Medical College of Ohio at Toledo	5	1,764,215	5	1,764,215	0	0	0	0
Norfolk Engineering	1	99,995	1	99,995	0	0	0	0
Northeastern Ohio Universities College of Medicine	1	109,022	1	109,022	0	0	0	0
Ohio State University	25	5,386,607	19	4,384,147	3	93,144	3	909,316
University of Akron	1	263,011	1	263,011	0	0	0	0
University of Cincinnati	40	13,552,261	34	11,524,397	4	504,264	2	1,523,600
University of Toledo	1	229,502	1	229,502	0	0	0	0
Wright State University	6	799,082	5	760,352	1	38,730	0	0
Total, Ohio	219	62,740,569	190	57,259,150	20	1,585,171	9	3,896,248
Oklahoma								
Oklahoma Medical Research Foundation	4	1,962,025	4	1,962,025	0	0	0	0
University of Oklahoma Health Sciences Center	13	5,029,785	11	4,931,635	2	98,150	0	0
University of Oklahoma, Norman	1	101,915	1	101,915	0	0	0	0
Total, Oklahoma	18	7,093,725	16	6,995,575	2	98,150	0	0
Oregon								
AVI Biopharma	1	98,771	1	98,771	0	0	0	0
Bend Research, Inc.	1	549,742	1	549,742	0	0	0	0
Oregon Center for Applied Science	1	409,026	1	409,026	0	0	0	0
Oregon Graduate Institute of Science and Technology	1	191,600	1	191,600	0	0	0	0
Oregon Health Sciences University	24	5,274,174	20	4,737,347	4	536,827	0	0
Oregon Regional Primate Research Center	1	189,848	1	189,848	0	0	0	0
Oregon Research Institute	1	30,390	1	30,390	0	0	0	0
Oregon State University	3	704,896	3	704,896	0	0	0	0
University of Oregon	2	540,528	2	540,528	0	0	0	0
Total, Oregon	35	7,988,975	31	7,452,148	4	536,827	0	0
Pennsylvania								
Allegheny University of Health Sciences	27	7,367,988	23	7,080,641	4	287,347	0	0
Allegheny-Singer Research Institute	1	338,359	0	0	0	0	1	338,359
C and L Instruments, Inc.	1	301,702	1	301,702	0	0	0	0
Cardiopulmonary Technologies Carnegie-Mellon University	2	199,955	2	199,955	0	0	0	0
5	1,452,183	4	1,422,023	1	30,160	0	0	
Children's Hospital of Philadelphia	32	12,441,641	28	12,243,640	3	149,025	1	48,976
Children's Hospital of Pittsburgh	4	546,520	4	546,520	0	0	0	0

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
Pennsylvania (continued)								
Drexel University	1	179,852	1	179,852	0	0	0	0
Fox Chase Cancer Center	1	152,940	1	152,940	0	0	0	0
Graduate Hospital, Philadelphia	1	317,114	1	317,114	0	0	0	0
Institute for Cancer Research	1	377,480	1	377,480	0	0	0	0
KDL Medical Technologies, Inc.	1	22,153	1	22,153	0	0	0	0
Magee-Women's Hospital	2	327,337	2	327,337	0	0	0	0
Message Pharmaceuticals, Inc.	1	312,120	1	312,120	0	0	0	0
Molecular Targeting Technology, Inc.	1	100,000	1	100,000	0	0	0	0
NIM, Inc.	1	372,836	1	372,836	0	0	0	0
Optical Devices, Inc.	1	99,980	1	99,980	0	0	0	0
Pennsylvania State University, Hershey Medical Center	24	6,727,380	19	4,803,069	3	89,480	2	1,834,831
Pennsylvania State University, University Park	10	1,323,923	9	1,297,747	1	26,176	0	0
Temple University	16	4,596,534	12	4,110,060	3	364,317	1	122,157
Thomas Jefferson University	25	7,446,180	21	6,997,864	4	448,316	0	0
Transcoil, Inc.	1	868,291	0	0	0	0	1	868,291
University City Science Center	2	373,831	2	373,831	0	0	0	0
University of Pennsylvania	112	32,123,090	92	29,539,336	17	1,769,872	3	813,882
University of Pittsburgh at Pittsburgh	59	17,603,130	50	13,903,992	5	832,031	4	2,867,107
University of the Sciences, Philadelphia	1	93,439	1	93,439	0	0	0	0
Weis Center for Research- Geisinger Clinic	1	238,295	1	238,295	0	0	0	0
Wistar Institute of Anatomy and Biology	3	463,783	3	463,783	0	0	0	0
Total, Pennsylvania	337	96,768,036	283	85,877,709	41	3,996,724	13	6,893,603
Rhode Island								
Brown University	4	485,987	3	447,969	1	38,018	0	0
Gordon Research Conferences	3	40,000	3	40,000	0	0	0	0
Memorial Hospital of Rhode Island	3	2,131,871	1	601,505	1	30,366	1	1,500,000
Miriam Hospital	4	1,134,950	3	991,058	0	0	1	143,892
Rhode Island Hospital, Providence	5	1,097,530	5	1,097,530	0	0	0	0
Total, Rhode Island	19	4,890,338	15	3,178,062	2	68,384	2	1,643,892
South Carolina								
Clemson University	1	206,352	1	206,352	0	0	0	0
Medical University of South Carolina	33	9,227,422	29	8,639,894	3	401,381	1	186,147
University of South Carolina at Columbia	5	1,374,154	5	1,374,154	0	0	0	0
Total, South Carolina	39	10,807,928	35	10,220,400	3	401,381	1	186,147

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
South Dakota								
U.S. PHS Aberdeen Area								
Indian Health Service.	1	733,865	1	733,865	0	0	0	0
University of South Dakota . . .	2	147,209	1	117,647	1	29,562	0	0
Total, South Dakota.	3	881,074	2	851,512	1	29,562	0	0
Tennessee								
East Tennessee State University								
Generx	2	200,000	2	200,000	0	0	0	0
Meharry Medical College.	9	1,011,539	7	787,267	2	224,272	0	0
Oak Ridge Associated								
Universities.	1	280,722	1	280,722	0	0	0	0
Softpsych	1	99,670	1	99,670	0	0	0	0
St. Jude Children's Research								
Hospital.	3	1,247,951	3	1,247,951	0	0	0	0
University of Memphis.	5	1,626,850	4	1,597,690	1	29,160	0	0
University of Tennessee at								
Memphis	23	5,042,288	18	3,627,033	3	366,501	2	1,048,754
University of Tennessee at								
Knoxville.	1	36,012	0	0	1	36,012	0	0
Vanderbilt University	54	13,641,790	44	12,530,659	9	863,591	1	247,540
Total, Tennessee.	104	24,274,144	85	21,458,314	16	1,519,536	3	1,296,294
Texas								
Baylor College of Medicine . . .								
Cooper Institute for Aerobics								
Research	2	1,246,190	1	605,494	0	0	1	640,696
Elcare Innovations, Inc.	1	99,758	1	99,758	0	0	0	0
Genemedicine, Inc.	1	303,490	1	303,490	0	0	0	0
Prairie View Agriculture and								
Mechanical University	0	159,406	0	159,406	0	0	0	0
Proportional Technologies, Inc.	2	503,456	2	503,456	0	0	0	0
Rice University	6	1,258,176	5	1,225,032	1	33,144	0	0
Southwest Foundation for								
Biomedical Research	4	6,401,731	4	6,401,731	0	0	0	0
Texas A&M University Health								
Science Center.	2	532,671	2	532,671	0	0	0	0
Texas Agricultural and								
Mechanical University								
Systems	2	325,786	2	325,786	0	0	0	0
Texas Engineering Experiment								
Station	14	1,987,311	13	1,951,541	1	35,770	0	0
Texas Technical University								
Health Sciences Center	3	302,165	3	302,165	0	0	0	0
University of North Texas								
Health Science Center	6	1,051,037	4	956,599	2	94,438	0	0
University of Texas at Austin. .	4	842,784	4	842,784	0	0	0	0
University of Texas at Dallas . .	1	260,427	1	260,427	0	0	0	0
University of Texas at El Paso .	1	13,496	0	0	1	13,496	0	0
University of Texas Health								
Center at Tyler	5	790,391	5	790,391	0	0	0	0

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
Texas (continued)								
University of Texas Health Science Center, Houston	25	24,342,625	20	5,906,996	2	76,934	3	18,358,695
University of Texas Health Science Center, San Antonio .	22	4,986,111	17	4,019,496	4	208,537	1	758,078
University of Texas M.D. Anderson Cancer Center	2	647,296	2	647,296	0	0	0	0
University of Texas Medical Branch at Galveston	17	3,566,604	16	3,373,301	0	0	1	193,303
University of Texas at San Antonio	1	81,045	1	81,045	0	0	0	0
University of Texas Southwest Medical Center at Dallas	41	16,139,721	36	15,289,998	5	849,723	0	0
Total, Texas	215	82,157,985	181	58,681,573	24	2,214,492	10	21,261,920
Utah								
Axon Medical, Inc.	1	358,566	1	358,566	0	0	0	0
Brigham Young University. . . .	2	306,202	2	306,202	0	0	0	0
Latter Day Saints Hospital. . . .	1	332,740	0	0	0	0	1	332,740
Medical Physics, Inc.	2	199,723	2	199,723	0	0	0	0
Medquest Products, Inc.	1	98,534	1	98,534	0	0	0	0
NPS Pharmaceuticals, Inc.	1	100,000	1	100,000	0	0	0	0
Oxygenator Technology Development, Inc.	1	99,152	1	99,152	0	0	0	0
University of Utah	53	13,445,556	47	13,071,862	6	373,694	0	0
Total, Utah	62	14,940,473	55	14,234,039	6	373,694	1	332,740
Vermont								
University of Vermont and State Agricultural College . . .	29	7,947,540	24	6,947,246	4	204,294	1	796,000
Total, Vermont	29	7,947,540	24	6,947,246	4	204,294	1	796,000
Virginia								
CW Optics, Inc.	2	299,744	2	299,744	0	0	0	0
Eastern Virginia Medical School of the Medical College of Hampton Roads	4	601,690	4	601,690	0	0	0	0
Hampton University.	0	10,800	0	0	0	10,800	0	0
Talisman, Ltd.	1	99,914	1	99,914	0	0	0	0
University of Virginia, Charlottesville.	43	10,163,942	30	9,101,447	13	1,062,495	0	0
Virginia Commonwealth University	15	2,623,869	11	2,369,876	4	253,993	0	0
Virginia Polytechnic Institute and State University.	1	176,673	1	176,673	0	0	0	0
Total, Virginia	66	13,976,632	49	12,649,344	17	1,327,288	0	0
Washington								
Barlow Scientific	1	257,800	1	257,800	0	0	0	0
Center for Health Studies.	2	643,023	2	643,023	0	0	0	0
EKOS, Corporation.	3	570,759	3	570,759	0	0	0	0

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
Washington (continued)								
Fred Hutchinson Cancer Research Center	14	10,092,751	11	5,614,108	0	0	3	4,478,643
Icogen.	1	384,108	1	384,108	0	0	0	0
Puget Sound Blood Center and Program.	1	261,313	1	261,313	0	0	0	0
Quantigraphics, Inc.	1	100,000	1	100,000	0	0	0	0
Seattle-King County Public Health Department	1	44,367	1	44,367	0	0	0	0
Spencer Technologies	1	397,536	1	397,536	0	0	0	0
University of Washington	107	38,446,048	84	34,473,015	17	1,920,583	6	2,052,450
Washington State University	3	499,333	2	469,771	1	29,562	0	0
Total, Washington	135	51,697,038	108	43,215,800	18	1,950,145	9	6,531,093
West Virginia								
Marshall University	1	98,716	1	98,716	0	0	0	0
West Virginia University	6	1,048,645	6	1,048,645	0	0	0	0
Total, West Virginia.	7	1,147,361	7	1,147,361	0	0	0	0
Wisconsin								
Advanced Medical Devices, Inc. Blood Center of Southeastern Wisconsin	8	3,186,374	7	3,069,894	1	116,480	0	0
Marquette University	1	179,526	1	179,526	0	0	0	0
Marshfield Clinic	1	606,960	1	606,960	0	0	0	0
Medical College of Wisconsin	45	12,211,828	39	11,146,276	5	309,648	1	755,904
Sinai Samaritan Medical Center	1	231,420	1	231,420	0	0	0	0
University of Wisconsin, Madison	54	13,530,604	47	12,361,026	6	387,667	1	781,911
Total, Wisconsin.	111	30,085,374	97	27,733,764	12	813,795	2	1,537,815
Puerto Rico								
University of Puerto Rico, Mayaguez	1	58,378	1	58,378	0	0	0	0
University of Puerto Rico Medical Sciences.	0	172,168	0	172,168	0	0	0	0
University of Puerto Rico, Rio Piedras	0	252,727	0	252,727	0	0	0	0
Total, Puerto Rico	1	483,273	1	483,273	0	0	0	0
Total, United States	4,494	\$1,400,321,805	3,797	\$1,187,549,157	490	\$49,548,929	206	\$163,223,719
Australia								
Institute of Medical and Veterinary Science	1	135,597	1	135,597	0	0	0	0
Total, Australia.	1	135,597	1	135,597	0	0	0	0
Canada								
Clinical Research Institute of Montreal	1	250,000	1	250,000	0	0	0	0
Hospital for Sick Children, Toronto	1	170,135	1	170,135	0	0	0	0

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
Canada (continued)								
Laval University	1	712,119	1	712,119	0	0	0	0
McGill University	1	175,000	1	175,000	0	0	0	0
University of Manitoba	2	115,650	2	115,650	0	0	0	0
University of Toronto	1	124,766	1	124,766	0	0	0	0
Total, Canada	7	1,547,670	7	1,547,670	0	0	0	0
United Kingdom								
University of London								
University College, London	1	136,662	1	136,662	0	0	0	0
University of Cambridge	1	25,000	0	0	1	25,000	0	0
University of Sheffield	1	88,800	1	88,000	0	0	0	0
University of Southampton	1	225,000	1	225,000	0	0	0	0
University of Warwick	1	100,000	1	100,000	0	0	0	0
Total, United Kingdom	5	575,462	4	550,462	1	25,000	0	0
Total, Other	13	\$2,258,729	12	\$2,233,729	1	\$25,000	0	0
Grand Total	4,506	\$1,402,580,534	3,809	\$1,189,782,886	491	\$49,573,929	206	\$163,223,719



Appendixes

Mortality Adjusted to 1940 Standard

Types of Research Activity

List of Abbreviations

Index



Mortality Adjusted to 1940 Standard

Death Rates for Cardiovascular and Noncardiovascular Diseases, U.S., 1977 and 1997

Cause of Death	Rate*		Rate Change	Percent Change
	1977	1997†		
All Causes	602	478	-124	-21
Cardiovascular Diseases	275	166	-109	-40
Coronary Heart Disease	160	83	-77	-48
Stroke	47	26	-21	-45
Other	68	57	-11	-16
Noncardiovascular Diseases	327	312	-15	-5

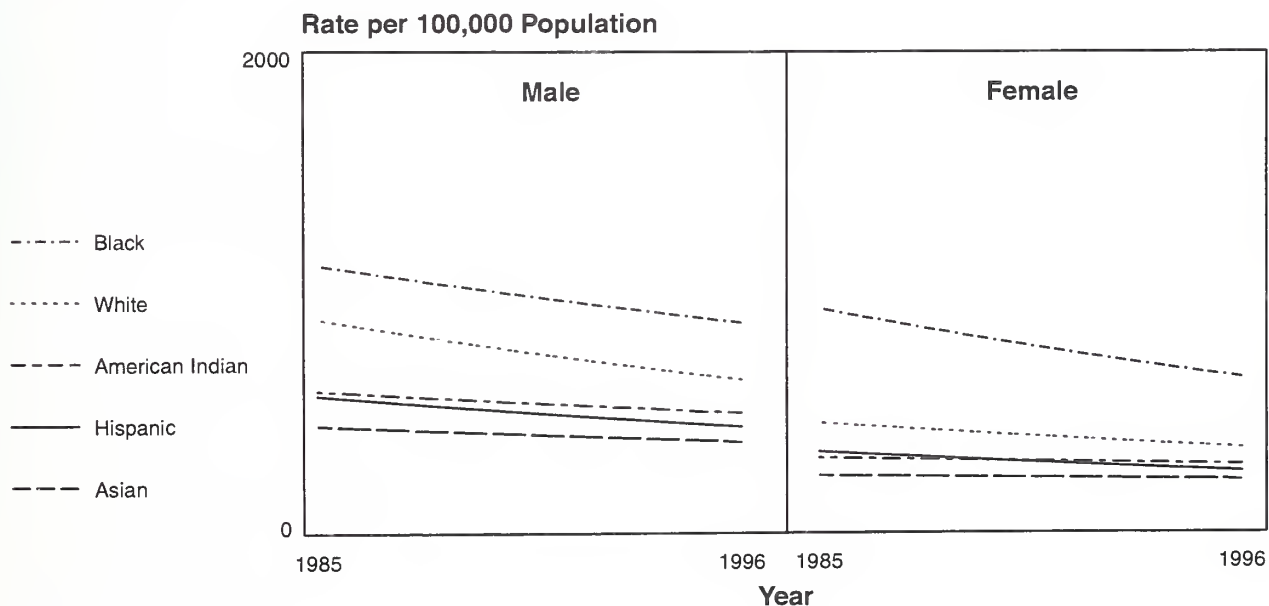
* Rate per 100,000 population age-adjusted to the 1940 standard.

† Data for 1997 are provisional or estimated by the NHLBI.

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

Source: Vital statistics of the U.S., NCHS.

Death Rates* for Heart Disease by Gender, Race, and Ethnicity, Ages 45 and Older, U.S., 1985-96

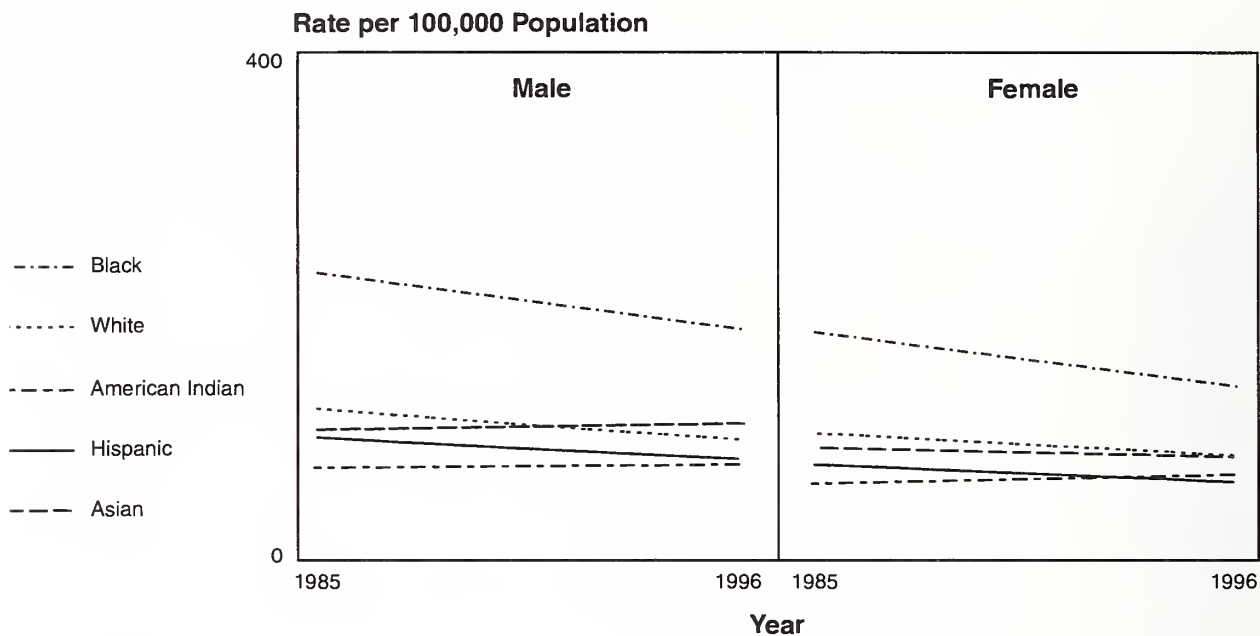


* Age-adjusted to the 1940 U.S. population.

Note: Each line is a log linear regression derived from the actual rates.

Source: Vital statistics of the U.S., NCHS.

Death Rates for Stroke by Gender, Race, and Ethnicity, Ages 45 and Older, U.S., 1985-96



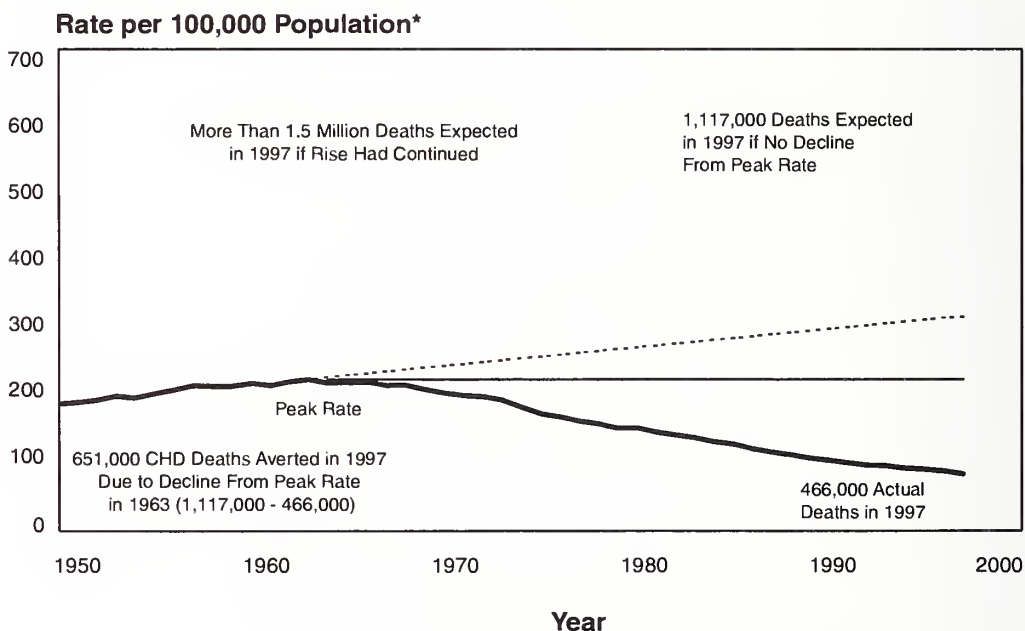
* Age-adjusted to the 1940 U.S. population.

Note: Each line is a log linear regression derived from the actual rates.

Source: Vital statistics of the U.S., NCHS.

Death Rates for Coronary Heart Disease, U.S., 1950-97

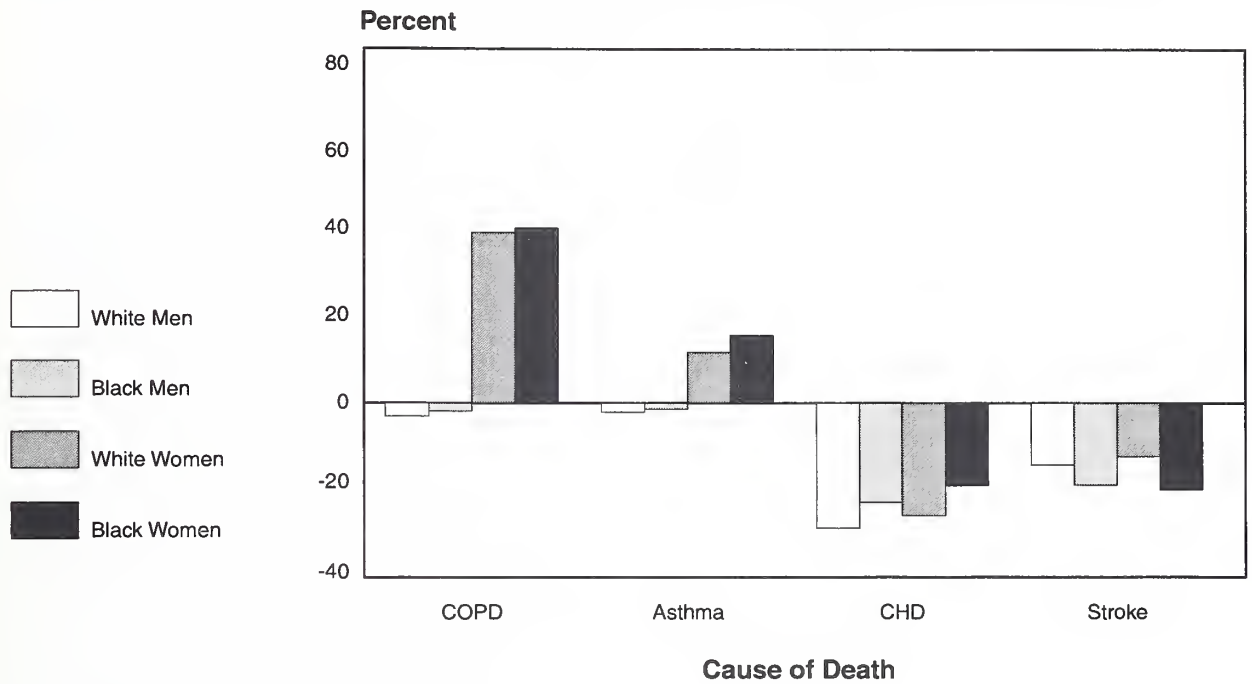
Actual Rate and Expected Rates if Rise Had Continued or Reached a Plateau



* Age-adjusted to the 1940 U.S. population. (Comparability ratio applied to 1968-78 rates.)

Source: Vital statistics of the U.S., NCHS. Data for 1997 are provisional.

Change in Death Rates* for Selected Causes by Race and Gender, U.S., 1987-97



* Age-adjusted to the 1940 U.S. population.

Source: Vital statistics of the U.S., NCHS.

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.

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.

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.

James A. Shannon Director's Award (R55): To provide a limited award to investigators to further develop, test, and refine research techniques; perform secondary analysis of available data sets; test the feasibility of innovative and creative approaches; and conduct other discrete projects that can demonstrate their research capabilities and lend additional weight to their already meritorious applications.

Research Centers

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 Centers Grants (P60): To support a multipurpose unit designed to bring together into a common focus divergent but related facilities within a given community; to foster biomedical research and development at both the fundamental and clinical levels; 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

Research Scientist Development Award (K01): To support scientists in need of both advanced research training and additional research experience in areas related to cardiovascular, lung, and blood health and disease; transfusion medicine; and sleep disorders.

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 Awards (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 Awards (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 (PCAA), the Preventive Pulmonary Academic Award (PPAA), the Transfusion Medicine Academic Award (TMAA), the Pulmonary Academic Award (PAA), and the Academic Awards in Systemic Pulmonary and Vascular Diseases. New grants are no longer awarded in the Pulmonary Academic Program.

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.

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.

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.

Professional Continuing Education (Development) Training (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 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.

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)

Predocctoral 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.

Minority Access to Research Careers (MARC) Faculty Fellowships (F34): To provide fellowships to faculty members from minority institutions to enable them to obtain advanced training in areas related to heart, lung, and blood diseases, blood resources, and sleep disorders.

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.

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.

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

ACCESS	A Case-Controlled Etiologic Study of Sarcoidosis	CIDA	Clinical Investigator Development Award
ACRN	Asthma Clinical Research Network	COPD	chronic obstructive pulmonary disease
ACT	Activity Counseling Trial	CSCC	Comprehensive Sickle Cell Centers
AFFIRM	Atrial Fibrillation Follow-up: Investigations in Rhythm Management	CVD	cardiovascular diseases
AIDS	acquired immunodeficiency syndrome	DASH	Dietary Approaches to Stop Hypertension
ALLHAT	Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial	DBDR	Division of Blood Diseases and Resources
ARDS	adult respiratory distress syndrome	DECA	Division of Epidemiology and Clinical Applications
ARDSNET	Acute Respiratory Distress Syndrome Clinical Network	DELTA	Dietary Effects on Lipoproteins and Thrombogenic Activity
ARIC	Atherosclerosis Risk in Communities	DHVD	Division of Heart and Vascular Diseases
AVID	Antiarrhythmic Versus Implantable Defibrillator	DIR	Division of Intramural Research
BARI	Bypass Angioplasty Revascularization Investigation	DISC	Dietary Intervention Study in Children
BEST	Beta-Blocker Evaluation Survival Trial	DLD	Division of Lung Diseases
CAMP	Childhood Asthma Management Program	DoT	Department of Transportation
CARDIA	Coronary Artery Risk Development in Young Adults	ENRICHED	Enhancing Recovery in Coronary Heart Disease
CATCH	Child and Adolescent Trial for Cardiovascular Health	ERA	Estrogen Replacement and Atherosclerosis
CCSCD	Clinical Course of Sickle Cell Disease	FDA	Food and Drug Administration
CF	cystic fibrosis	FIRST	First Independent Research Support and Transition
CHD	coronary heart disease	FY	fiscal year
CHF	congestive heart failure	HBCU	Historically Black Colleges and Universities
CHS	Cardiovascular Health Study	HEW	Department of Health, Education, and Welfare (now HHS)
		HHS	Health and Human Services (formerly HEW)
		HIV	human immunodeficiency virus

HIVIG	HIV Immunoglobulin	NHLBI	National Heart, Lung, and Blood Institute (formerly NHI and NHLI)
HRT	hormone replacement therapy	NHLI	National Heart and Lung Institute
ICD	International Classification of Diseases; also, implantable cardiac defibrillator	NICHHD	National Institute of Child Health and Human Development
IVAS	Innovative Ventricular Assist System	NIDDK	National Institute of Diabetes and Digestive and Kidney Diseases
JHS	Jackson Heart Study	NIH	National Institutes of Health
MAGIC	Magnesium in Coronaries	NRSA	National Research Service Award
MARC	Minority Access to Research Careers	OD	Office of the Director
MBRS	Minority Biomedical Research Support	OEI	Obesity Education Initiative
MERIT	Method to Extend Research in Time	OPEC	Office of Prevention, Education, and Control
MGS	Mammalian Genotyping Service	ORMH	Office of Research on Minority Health
MI	myocardial infarction	P2C2	Pediatric Pulmonary Cardiac Complication of HIV
MOST	Most Selection Trial in Sinus Node Dysfunction	PA	Program Announcement
MSH	Multicenter Study of Hydroxyurea in Sickle Cell Anemia	PATHWAYS	Obesity Prevention in American Indians
NAEPP	National Asthma Education and Prevention Program	PEACE	Prevention of Events With Angiotensin Converting Enzyme Inhibitor Therapy
NCEP	National Cholesterol Education Program	PEPI	Postmenopausal Estrogen/ Progestin Interventions
NCHS	National Center for Health Statistics	PHS	Public Health Service
NCSDR	National Center on Sleep Disorders Research	R&D	research and development
NETT	National Emphysema Treatment Trial	REACT	Rapid Early Action for Coronary Treatment
NHAAP	National Heart Attack Alert Program	REDS	Retrovirus Epidemiology Donor Study
NHANES	National Health and Nutrition Examination Survey	REMATCH	Randomized Evaluation of Mechanical Assistance for the Treatment of Chronic Heart Failure
NHBPEP	National High Blood Pressure Education Program	RFA	Request for Applications
NHI	National Heart Institute	RFP	Request for Proposals
NHIS	National Health Interview Survey	RMS	research management and support
		RPG	research project grants
		SBIR	Small Business Innovation Research

SCD	Sickle cell disease	WACS	Women's Antioxidant and Cardiovascular Study
SCOR	Specialized Center(s) of Research	WAVE	Women's Angiographic Vitamin and Estrogen Trial
SEP	Special Emphasis Panel	WELL-HART	Women's Estrogen/Progestin Lipid-Lowering Hormone Atherosclerosis Regression Trial
SIDS	sudden infant death syndrome	WHI	Women's Health Initiative
STOP	Stroke Prevention in Sickle Cell Anemia	WISE	Women's Ischemia Syndrome Evaluation
STTR	Small Business Technology Transfer	WHO	World Health Organization
TB	tuberculosis		
TOHP	Trials of Hypertension Prevention		
VATS	Viral Activation Transfusion Study		



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