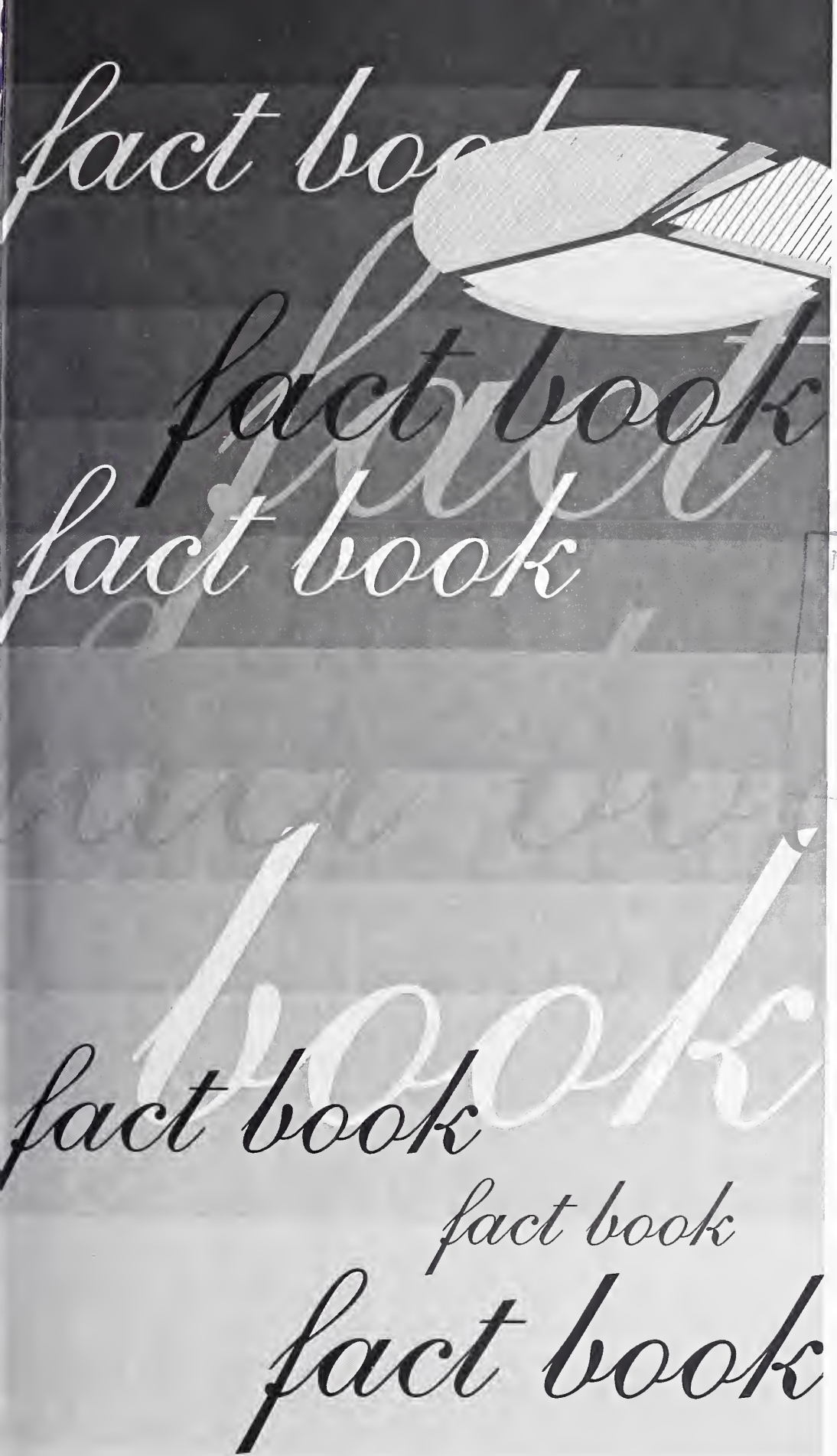
FACT BOOK

FISCAL YEAR

1997

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



Fact Book

Fiscal Year

1997

February 1998

For Administrative Use

National Institutes

of Health

National Heart, Lung,

and Blood Institute

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1. Directory of Personnel*

Office of the Director	Bldg.	Room	Phone	MSC†,‡
Director, **Claude Lenfant, M.D.**	31	5A52	496-5166	2486
Deputy Director, **Peter L. Frommer, M.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, **Sheila Merritt**	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, **Sheila Merritt**	31	5A48	496-2411	2490
Technology Development Coordinator, **Lillianne M. Portilla**	31	1B30	402-5579	2490
Management Policy and Administrative Services Branch Acting Chief, **Barry Rubinstein**	31	5A33	496-5931	2490
Freedom of Information Coordinator, **Suzanne Anthony**	31	5A10	496-9737	2490
Privacy Act Coordinator, **Suzanne Anthony**	31	5A10	496-9737	2490
Financial Management Branch Chief, **James R. Wehling**	31	5A48	496-4653	2490
Personnel Management Branch Chief, **Barry Rubinstein**	31	5A28	496-6477	2484
National Center on Sleep Disorders Research				
Director, **James P. Kiley, Ph.D.**	RKL2§	7124	435-0199	7920
Office of Prevention, Education, and Control				
Director, **Gregory J. Morosco, Ph.D., M.P.H.**	31	4A03	496-5437	2480
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

* Current as of October 15, 1997. 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.

Office of the Director (cont'd.)	**Bldg.**	**Room**	**Phone**	**MSC**
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				
Director, **Carl A. Roth, Ph.D., LL.M.**	31	5A03	496-6331	2482
Deputy Director, **Barbara Liu, S.M.**	31	5A06	496-9899	2482
Office of International Programs Director, **Ruth J. Hegyeli, M.D.**	31	4A07	496-5375	2490
Program Studies and Reports Program Director, **Carl A. Roth, Ph.D., LL.M.**	31	5A03	496-6331	2482
Science and Legislation Program Director, **Barbara Liu, S.M.**	31	5A06	496-9899	2482
Information Resources and Technology Program Director, **John J. Filigenzi**	RKL2	8093	435-0119	7932
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	9152	435-0484	7940
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 Leader, **John T. Watson, Ph.D.**	RKL2	9178	435-0513	7940
Ischemic Heart Disease Scientific Research Group Leader, **John L. Fakunding, Ph.D.**	RKL2	9200	435-0505	7940
Congenital and Infectious Diseases Scientific Research Group Acting Leader, **John L. Fakunding, Ph.D.**	RKL2	9200	435-0505	7940
Heart Failure Scientific Research Group Leader, **Judith Massicot-Fisher, Ph.D.**	RKL2	9184	435-0504	7940
Interventional Cardiology Scientific 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				
Director, **David M. Robinson, Ph.D.**	RKL2	10196	435-0545	7956
Senior Scientific Advisor, **Basil M. Rifkind, M.D.**	RKL2	10190	435-0545	7956
Atherosclerosis Scientific Research Group Leader, **Momtaz Wassef, Ph.D.**	RKL2	10188	435-0550	7956
Cardiovascular Homeostasis and Bionutrition Scientific Research Group Leader, **Abby G. Ershow, Sc.D.**	RKL2	9186	435-0540	7940
Hypertension Scientific Research Group Leader, **Paul A. Velletri, Ph.D.**	RKL2	10202	435-0560	7956

Division of Heart and Vascular Diseases (cont'd.)	**Bldg.**	**Room**	**Phone**	**MSC**
Molecular Genetics and Medicine Scientific Research Group				
Leader, **Sonia Skarlatos, Ph.D.**	RKL2	10186	435-1802	7956
Vascular Biology Scientific Research Group				
Leader, **Stephen Goldman, Ph.D.**	RKL2	10192	435-0565	7956
Vascular Medicine Scientific Research Group				
Leader, **David J. Gordon, M.D., Ph.D.**	RKL2	10184	435-0555	7956
Training and Special Programs Scientific Research Group				
Leader, **Beth Schucker, M.A.**	RKL2	9206	435-0535	7940
Division of Lung Diseases				
Director, **Suzanne S. Hurd, Ph.D.**	RKL2	10122	435-0233	7952
Deputy Director, **Carol E. Vreim, Ph.D.**	RKL2	10120	435-0233	7952
Administrative Officer, **Loretta L. Barnes**	RKL2	10116	435-0244	7952
Airway Biology and Disease Program				
Director, **James P. Kiley, Ph.D.**	RKL2	10210	435-0202	7952
Senior Scientific Advisor,				
Susan P. Banks-Schlegel, Ph.D.	RKL2	10220	435-0202	7952
Asthma Scientific Research Group				
Leader, **Susan P. Banks-Schlegel, Ph.D.**	RKL2	10220	435-0202	7952
Chronic Obstructive Pulmonary Disease/Environment Scientific Research Group				
Leader, **Gail G. Weinmann, M.D.**	RKL2	10208	435-0202	7952
Cystic Fibrosis Scientific Research Group				
Leader, **Susan P. Banks-Schlegel, Ph.D.**	RKL2	10220	435-0202	7952
Sleep and Neurobiology Scientific Research Group				
Leader, **Michael J. Twery, Ph.D.**	RKL2	10222	435-0202	7952
Training and Special Programs Scientific Research Group				
Leader, **J. Sri Ram, Ph.D.**	RKL2	10206	435-0202	7952
Lung Biology and Disease Program				
Director, **Dorothy B. Gail, Ph.D.**	RKL2	10100	435-0222	7952
Senior Scientific Advisor, **Robert A. Musson, Ph.D.**	RKL2	10108	435-0222	7952
Acquired Immunodeficiency Syndrome/Tuberculosis Scientific Research Group				
Leader, **Hannah H. Peavy, M.D.**	RKL2	10110	435-0222	7952
Critical Care/Acute Lung Injury Scientific Research Group				
Acting Leader, **Robert A. Musson, Ph.D.**	RKL2	10108	435-0222	7952
Developmental Biology and Pediatrics Scientific Research Group				
Leader, **Mary Anne Berberich, Ph.D.**	RKL2	10102	435-0222	7952
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
Director, **Clarice D. Reid, M.D.**	RKL2	10160	435-0080	7950
Deputy Director, **Carol H. Letendre, Ph.D.**	RKL2	10162	435-0080	7950
Administrative Officer, **Judith Ireland**	RKL2	10168	435-0085	7950
Program Analysis Officer, **Susan Pucie**	RKL2	10166	435-0584	7950
Blood Resources Program				
Director, **Paul R. McCurdy, M.D.**	RKL2	10138	435-0065	7950
Transfusion Medicine Scientific Research Group				
Leader, **George J. Nemo, Ph.D.**	RKL2	10142	435-0075	7950
Bone Marrow Transplantation Scientific Research Group				
Leader, **Paul McCurdy, M.D.**	RKL2	10138	435-0065	7950
Thrombosis and Hemostasis Scientific Research Group				
Leader, **Pankaj Ganguly, Ph.D.**	RKL2	10176	435-0070	7950
Training and Special Programs				
Joyce I. Creamer, M.B.A.	RKL2	10170	435-0061	7950
Blood Diseases Program				
Director, (Vacant)	RKL2	10158	435-0050	7950
Sickle Cell Disease Scientific Research Group				
Leader, **Duane Bonds, M.D.**	RKL2	10148	435-0055	7950
Cellular Hematology Scientific Research Group				
Leader, (Vacant)	RKL2	10158	435-0050	7950
Training and Special Programs				
Bette A. Houston	RKL2	10159	435-0061	7950
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, M.S., R.D.**	RKL2	8112	435-0422	7938
Administrative Officer, **Patricia Robertson**	RKL2	8110	435-1285	7938
Office of Biostatistics Research				
Director, **Nancy L. Geller, Ph.D.**	RKL2	8210	435-0434	7938
Clinical Applications and Prevention Program				
Director, **Jeffrey Cutler, M.D.**	RKL2	8130	435-0414	7936
Prevention Scientific Research Group				
Leader, **Denise Simons-Morton, M.D., Ph.D.**	RKL2	8138	435-0377	7936
Clinical Trials Scientific Research Group				
Leader, **Michael Domanski, M.D.**	RKL2	8146	435-0399	7936
Behavioral Medicine Scientific Research Group				
Leader, **Peter G. Kaufmann, Ph.D.**	RKL2	8118	435-0404	7936
Epidemiology and Biometry Program				
Director, **Teri Manolio, M.D., M.H.S.**	RKL2	8160	435-0707	7934
Field Studies and Clinical Epidemiology Scientific Research Group				
Assistant Director, **Diane Bild, M.D.**	RKL2	8154	435-0701	7934
Framingham Epidemiology Research Unit				
Leader, **Daniel Levy, M.D.**	5 Thurber Street Framingham, MA 01701 (508) 935-3458			
Social and Environmental Epidemiology Scientific Research Group				
Leader, **A. Richey Sharrett, M.D., Dr.P.H.**	RKL2	8164	435-0444	7934
Analytical Resources Scientific Research Group				
Leader, **Paul D. Sorlie, Ph.D.**	RKL2	8176	435-0449	7934

Division of Extramural Affairs	Bldg.	Room	Phone	MSC
Director, **Ronald G. Geller, Ph.D.**	RKL2	7100	435-0260	7922
Deputy Director, **C. James Scheirer, Ph.D.**	RKL2	7220	435-0266	7924
Administrative Officer, **Christinia Roark**	RKL2	7110	435-0252	7922
Committee Management Specialist, **Kathryn M. Valeda**	RKL2	7108	435-0255	7922
Review Branch				
Chief, **C. James Scheirer, Ph.D.**	RKL2	7220	435-0266	7924
Senior Scientific Review Advisor, **Louis M. Ouellette, Ph.D.**	RKL2	7216	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 Leader, **Jeffrey H. Hurst, Ph.D.**	RKL2	7208	435-0303	7924
Clinical Studies and Training Scientific Review Group Leader, **Anthony M. Coelho, Jr., Ph.D.**	RKL2	7194	435-0288	7924
Contracts Operations Branch				
Chief, **Robert R. Carlsen**	RKL2	6100	435-0330	7902
Heart, Lung, and Vascular Diseases Section Chief, **Douglas W. Frye**	RKL2	6106	435-0340	7902
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, **Thomas G. Turley**	RKL2	7160	435-0144	7926
Heart and Vascular Diseases Section Chief, **William W. Darby**	RKL2	7128	435-0177	7926
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, **Harry R. Keiser, M.D.**	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				
Chief, **Stephen E. Epstein, M.D.**	10	7B15	496-5817	1650
Clinical Physiology and Molecular and Cellular Biology Section Chief, **Stephen E. Epstein, M.D.**	10	7B15	496-5817	1650
Cardiac Catheterization Section Chief, **Richard O. Cannon, M.D.**	10	7B15	496-9985	1650
Cardiac Consultation Section Chief, **Eben E. Tucker, M.D.**	10	7B15	496-2742	1650
Experimental Physiology and Pharmacology Section Chief, (Vacant)	10	7B07	496-1421	1650

Division of Intramural Research (cont'd.)	Bldg.	Room	Phone	MSC
Inherited Cardiovascular Disease Section				
Chief, **Neal D. Epstein, M.D.**	10	8N112	496-2102	1650
Nuclear Cardiology Section				
Chief, (Vacant)	10	7B15	496-5817	1650
Cardiac 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, **Harry R. Keiser, M.D.**	10	8C103	496-1518	1754
Molecular Disease Branch				
Chief, **H. Bryan Brewer, M.D.**	10	7N117	496-5095	1666
Cell Biology Section				
Chief, **Jeffrey M. Hoeg, M.D.**	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 Mechanisms Section				
Chief, **Joel Moss, M.D., Ph.D.**	10	6D03	496-1597	1590
Pulmonary and Cardiac Assist Devices Section				
Chief, **Theodor Kolobow, M.D.**	10	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	122	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
Chemical Pharmacology Section				
Chief, **Gopal A. Krishna, Ph.D.**	10	8N107	496-2098	1760
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

NIH Mailing Address Formats

NHLBI staff E-Mail addresses can be found by using the NIH Directory Service. The Directory Service is located on the NIH Gopher Server under E-Mail and Directory Services.

Please use the following formats for NIH mailing addresses:

Building 3
Full Name
NHLBI, NIH
Building 3, Room ____
3 Center Drive, MSC* ____
Bethesda, MD 20892-MSC†

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

Building 14E
Full Name
NHLBI, NIH
Building 14E, Room ____
14 Service Road South, MSC* ____
Bethesda, MD 20892-MSC†

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

Building 36
Full Name
NHLBI, NIH
Building 36, Room ____
36 Convent Drive, MSC* ____
Bethesda, MD 20892-MSC†

Rockledge II Building
Full Name
NHLBI, NIH
Two Rockledge Center, Room ____
6701 Rockledge Drive, MSC* ____
Bethesda, MD 20892-MSC†

* 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 and sleep disorders.

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' relevant 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 NHLBI, in response to a need to streamline its operations, reorganized its program in the manner shown on page 10. This program is 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). 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.

Division of Heart and Vascular Diseases

An estimated 58 million Americans have CVD, 34 million of whom are under 65 years of age. Hypertension affects 50 million of the U.S.

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

Heart and Vascular Diseases

Heart Research
Arrhythmias
Bioengineering
Ischemic Heart Disease
Congenital and Infectious Diseases
Heart Failure
Interventional Cardiology

Vascular Research
Molecular Genetics and Medicine
Atherosclerosis
Hypertension
Vascular Biology
Vascular Medicine
Cardiovascular Homeostasis and Bionutrition

Lung Diseases

Airway Biology and Disease
Asthma
Chronic Obstructive Pulmonary Disease and Environment
Cystic Fibrosis
Neurobiology and Sleep

Lung Biology and Disease
Acquired Immunodeficiency Syndrome and Tuberculosis
Critical Care and Acute Lung Injury
Developmental Biology and Pediatrics
Immunology and Fibrosis
Lung Cell and Vascular Biology

Blood Diseases and Resources

Blood Diseases
Sickle Cell Disease
Cellular Hematology

Blood Resources
Transfusion Medicine
Bone Marrow Transplantation
Thrombosis and Hemostasis

Epidemiology and Clinical Applications

Clinical Applications and Prevention
Prevention
Clinical Trials
Behavioral Medicine

Epidemiology and Biometry
Field Studies and Clinical Epidemiology
Social and Environmental Epidemiology
Analytical Resources

National Center on Sleep Disorders Research

Sleep
Sleep Disorders and Related Conditions

Intramural Research

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

population. Approximately 13.9 million Americans have coronary heart disease (CHD), almost 5 million have congestive heart failure (CHF), almost 4 million have cerebrovascular disease, and 2 million have peripheral vascular diseases. Of all the people with these diseases, about 8 million are limited in activity. In 1996, about 41 percent of all deaths (962,000) were attributed to CVD, and 52 percent of them occurred in women. The economic cost to the Nation in 1998 is projected to be an estimated $274 billion, of which $171 billion will be for health expenditures and $103 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, which are an important part of the research

program, 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 population of the United States and the increased survival from other forms of heart disease due to advances in the field of coronary heart disease. From 1982 to 1995, the number of hospitalizations attributed to CHF doubled to 872,000. In 1995, 43,000 deaths were primarily associated with heart failure, with another 240,000 having heart failure as a secondary cause. To address the urgent need for additional research in this area, the DHVD funded a Specialized Centers of Research (SCOR) program in heart failure with five centers. Eight program project grants focusing on heart muscle research in relation to failure also received support. A clinical trial was initiated to test the use of left ventricular assist devices (LVADs) to take some of the strain off the ailing heart muscle. Investigators will compare a wearable LVAD to optimal medical treatment in patients with severe CHF who are not candidates for heart transplants. The Division provided cofunding for a conference grant, Cardiac Failure: From Basic Research to Clinical Applications, with emphasis on heart failure in blacks and women. In addition, a Special Emphasis Panel was held on heart failure, followed by a workshop, "Treatment and Diagnosis of Cardiac Maladaptive Remodeling," to explore research directions.

Heart disease, atherosclerosis, and hypertension are also areas of major research emphasis in the DHVD. 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 1997, the DHVD, along with other Divisions in the Institute, initiated studies to examine the role of mitochondrial DNA (mtDNA) mutations in heart, blood vessel, blood, and lung diseases. Their goals are to define mechanisms by which mtDNA mutations cause tissue-specific, progressive diseases and to elucidate cause-and-effect relationships between alterations in mtDNA and pathological phenotypes. Another area of collaborative research within the Institute involves efforts to advance gene transfer technology and its potential application to cardiovascular, pulmonary, and hematologic diseases. The overall objective is to foster research that will provide the basic science foundation necessary for gene transfer technology and its application to somatic gene transfer.

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.

In FY 1997, studies were initiated in molecular medicine and atherosclerosis to determine the etiology and pathobiology of atherosclerotic lesions at the molecular level. Research findings will enable scientists to employ a systematic targeting and design approach to clinical interventions.

The DHVD continues to place high priority on selected U.S. subpopulations such as women, minorities, and children. In addition to ensuring that women and minorities are appropriately represented in all clinical studies, many DHVD programs specifically target women or minorities. For example, several clinical trials have been established to examine the effect of postmenopausal hormone replacement therapy on cardiovascular health. Programs addressing minority heath issues include ischemic heart disease in blacks and molecular genetics of hypertension in blacks. Two clinical trials are under way to study ethnic differences in autonomic cardiovascular control, and antioxidants and prevention of early atherosclerosis in black patients with carotid artery disease. Research programs specifically related to children focus on innovative approaches to elucidate the etiology, pathophysiology, and diagnosis of congenital and acquired cardiovascular diseases in pediatric populations so that more effective methods of treatment and prevention can be developed.

A new program, cosponsored with the NIH Office of Minority Health, was recently funded to

strengthen research efforts at historically black colleges and universities (HBCUs). The 7-year HBCU Research Scientist Program is providing support to recruit established scientists to enhance the research facility at six HBCUs. The DHVD also administers a varied and active career development program with substantive support for minority fellowships and training grants.

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 227,000 deaths annually and are a contributing cause 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 1995, pulmonary diseases accounted for 28 percent of all hospitalizations of children under 15 years of age in the United States. The projected economic cost to the Nation in 1998 is about $122 billion, of which $85 billion will be for health expenditures and $37 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.

The NHLBI established six centers for gene therapy in FY 1993. Presently, the centers are focusing mainly on cystic fibrosis (CF) research but also address other areas associated with gene therapy for heart, lung, and blood diseases. Basic, preclinical, and clinical studies are directed toward developing safe, efficient, and efficacious vehicles for delivering genes to appropriate target cells. Basic science and clinical findings are identifying new directions needed to generate improved gene transfer vectors, to manage the inflammatory and immune consequences of vector transfer, and to develop alternative vector systems. A grant program was initiated to stimulate research on the molecular pathogenesis and pathophysiology of CF and to develop new approaches to therapy. Several grants were cofunded with the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK).

In 1997, the Division sponsored several workshops to identify gaps in existing knowledge and to establish research priorities in selected critical areas. A workshop on chronobiology of asthma was convened to review and assess the current state of knowledge in the pathogenesis of nocturnal asthma—specifically the role of circadian rhythm in sleep and in the inflammatory process, airway function, immune responses, and tissue growth and repair. Other recent workshops were held to develop research strategies in the field of proliferative and occlusive vascular disease, pulmonary host defense and disease, lymphangioleiomyomatosis, pulmonary artery catheterization, and antisense technology.

Asthma research is an area of high priority for the Division. The DLD supports a collaborative multicenter study in human pedigrees from various racial/ethnic groups to identify the major genes responsible for asthma. Gene mapping studies have linked asthma in various ethnic groups to a number of different chromosomal regions. Although linkages are a long way from a solution to asthma, they are an important start in the search for asthma genes. Identification of genes will facilitate development of new modes of treatment and will lead to an understanding of causal interactions between genes and environmental factors.

The Division supports several research programs designed to develop and evaluate effective strategies for improving asthma care among Latino and black children, who appear to suffer disproportionately from the disease. Some of the findings from this research were recently published in the document *Asthma Management in Minority Children: Practical Insights for Clinicians, Researchers, and Public Health Planners*. Other asthma research projects involving children include a 5-year, multicenter clinical trial to examine the long-term effects of three different asthma medications on 1,000 children and a study to develop and evaluate innovative approaches to ensure optimal disease management and prevention in the elementary school setting. The DLD is also participating in a collaborative study with the National Institute of Child Health and Human Development (NICHD) to determine the effects

of asthma and its treatment on pregnancy and the effects of pregnancy on asthma.

The Division supports an asthma clinical research network of interactive clinical research groups to enable rapid assessment of new treatment methods and to 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. The protocol has been approved for a fifth trial to estimate dose-response curves with respect to adrenal suppression for six distinct inhaled corticosteroid delivery systems.

To promote application of recent scientific findings in the clinical setting, the Division 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. With its international partners and the World Health Organization (WHO), the DLD 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.

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; the effect of inhaled corticosteroids on lung function in continuing smokers; and the 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.

Sleep apnea is a disorder characterized by frequent interruptions in breathing during sleep; it affects individuals of all ages and ethnic groups. The DLD supports a diverse program 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 management of associated risks such as high blood pressure; and applied studies to examine how apnea is detrimental to productivity and quality of life. The Division also supports a multicenter study to explore clinical and epidemiological relationships between apnea and cardiovascular disease and a SCOR program to encourage interaction between basic scientists and clinical investigators in cardiopulmonary disorders during sleep so that the translation of scientific advances into strategies for treatment and prevention of sleep disorders is facilitated.

Acquired immunodeficiency syndrome (AIDS) and tuberculosis (TB) are also important areas of investigation for the Division. Specific programs include a clinical study of cardiopulmonary complications of human immunodeficiency virus (HIV) infection in infants and children, several programs to address pathobiology of *Pneumocystis carinii,* basic cell biology of pulmonary manifestations of AIDS, development of lung-specific drug delivery systems for enhanced TB treatment, and behavioral interventions for control of TB. Last year a program to support research on cellular and molecular events involved in regulation of HIV activation in the lung was initiated. Microbial and other co-factors, cytokines, and chemokines that allow HIV to remain quiescent in lung cells and those that stimulate viral replication are being investigated.

Continuing programs include a prospective randomized clinical trial to assess innovative treatment methods in patients at risk for developing adult respiratory distress syndrome; an epidemiological study to investigate causes and environmental and genetic risk factors for sarcoidosis; a study of causes of noninfectious pneumonia, an often fatal complication of bone marrow transplantation; basic studies of cellular and molecular mechanisms of primary pulmonary hypertension; and a multi-institutional collaboration to create a molecular profile of bronchopulmonary dysplasia that will provide

insight into the condition and offer directions for developing new reagents for clinical interventions.

The Division initiated several new programs in 1997. Included among them are basic research studies to investigate host factors controlling individual susceptibility to HIV-associated pulmonary disease; clinical trials to compare the efficacy of lung volume reduction surgery to maximal medical treatment in patients with emphysema; and multidisciplinary research studies to enable basic science findings to be applied more rapidly to clinical problems in three discrete areas—the pathobiology of fibrotic lung disease, the pathobiology of lung development, and cellular and molecular mechanisms of asthma.

Other activities supported by the Division include research training and career development programs to provide postdoctoral opportunities to 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.

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 266,000 deaths in 1996; 257,000 of them were due to thrombotic disorders and 9,000 were due to diseases of the red blood cells and bleeding disorders. In 1998, thrombotic disorders and other blood diseases will cost an estimated $78 billion, of which $48 billion will be for health expenditures and $30 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 1992, an estimated 23 million units of blood products were transfused to 5 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 product 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 develops, administers, and coordinates programs to reduce morbidity and mortality caused by blood diseases and lead to their primary prevention. Diseases addressed include hemophilia, Cooley's anemia, sickle cell disease, and disorders of hemostasis and thrombosis. 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.

Finding an effective therapy for sickle cell disease remains a high priority. Despite progress in the area of treatment, no universally effective therapeutic agent exists. The drug hydroxyurea, although promising, may have long-term side effects and its safety and efficacy in children are unknown. In September 1997, the Stroke Prevention Trial in Sickle Cell Anemia was terminated early when it was determined that prophylactic transfusion therapy resulted in a 90 percent relative decrease in the stroke rate. The trial was conducted among children ages 2 to 16 years old.

Dissemination of research findings to the medical community through workshops, conferences, and consensus development conferences is an important function of the Division. Efforts to disseminate research results have been conducted in such topics as 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 sickle cell disease, and management of patients with hepatitis C.

In 1997, the Division sponsored several workshops to review progress in identified areas and to develop strategies for future research. Investigators studying Fanconi anemia met to evaluate recent progress and to develop recommendations

for research on its pathogenesis and treatment. Scientists studying the immunogenetics of inhibitor formation in hemophilia gathered to review research related to the formation of inhibitor antibodies in patients with hemophilia and produced recommendations to promote research to understand the mechanism of immune response to factor VIII and IX and to apply the knowledge of immune interactions to block inhibitor formation. The National Sickle Cell Disease Program Annual Conference celebrated its 25th Anniversary in September 1997. Attendees reviewed and updated advances in basic and clinical research designed to enhance understanding of the pathophysiology, management, and treatment of sickle cell disease and to improve the ability of health care providers to provide education, genetic counseling, and psychosocial support to patients and their families.

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 sickle cell disease are currently being supported.

Division of Epidemiology and Clinical Applications

The DECA has the primary responsibility for epidemiologic 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 the causes, prevention, diagnosis, and treatment of these diseases; and assesses the need for technologic development in the 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.

Understanding the genetic and nongenetic determinants of CVD risk factors and their role in the development of CVD are a major focus of the Division. Population-based surveillance studies are used to monitor and explain trends in risk factors for CVD and trends in CVD morbidity and mortality. Specific attention is directed to epidemiological studies of CVD risk factors in Native Americans and middle-aged blacks. For example, the DECA is supporting an elementary school-based intervention trial to determine whether changes in diet and physical activity can reduce the incidence of obesity in Native American children. A single-site prospective study similar to those previously initiated in Framingham, MA, and Honolulu, HI, will be established to investigate the impact of environmental and genetic factors on the development of CVD in blacks. The NHLBI, along with the Office of Research on Minority Health, two historically black colleges and one regional university, will undertake an expansion of previous efforts in this area.

Developing 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 will begin in 1998. It will permit a comparison of new and established measures of subclinical disease, and contribute to development of methods for identifying asymptomatic persons at greatest risk for clinical events. In addition, it will assess the possibility of using a noninvasive assessment to measure subclinical CVD development.

Another area of research supported by the Division concerns the possibility that several dietary factors, other than 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 examining 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 a clinical trial is under way 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. A study involving a subset of

hypercholesterolemic patients is investigating whether reducing serum cholesterol levels with a lipid-lowering drug decreases the incidence of nonfatal MI and fatal CHD.

Multicenter clinical trials are being conducted to study the effects of various medical treatments for cardiac problems. Among the issues being investigated are effect on mortality of beta-blockers compared with standard therapy for chronic congestive heart failure, 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 concluded on the effectiveness of an implantable cardiac defibrillator compared with conventional pharmacological therapy in reducing mortality in patients who have been resuscitated from sudden cardiac death.

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). Its role is to support research, research training, health information dissemination, and other activities with respect to sleep disorders. Areas of emphasis include basic understanding of sleep, biological and circadian rhythm research and chronobiological and other sleep-related research. The NCSDR coordinates its activities with those of other NIH components, Federal agencies, and for-profit and non-profit entities.

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 NCSDR 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's working groups are examining issues such as baseline analysis of NIH sleep-related grants, the effect of the Center for Scientific Review's study section reorganization on sleep applications, and diagnostic nosology of sleep research.

Since its inception, the NCSDR has initiated a multicenter study to determine whether sleep apnea is an independent or contributing risk factor for the development of cardiovascular and cerebrovascular disease; a collaboration with the National Institute of Child Health and Human Development (NICHD) to establish a campaign to reduce risk of sudden infant death syndrome (SIDS); a partnership for the "Drive Alert...Arrive Alive" program with the Department of Transportation and the National Sleep Foundation (NSF); and a joint project with the National Institute of Mental Health (NIMH), the NICHD, and the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) on the molecular biology and genetics of sleep and sleep disorders.

In FY 1997, the Center collaborated on a number of NIH- and Government-wide activities. These activities included a workshop on "Gene Expression During Sleep" at the World Conference on Brain Research; a scientific conference with the Restless Legs Syndrome Foundation, Inc.; a workshop with the American Thoracic Society (ATS) on the "Neurobehavioral and Cognitive Sequelae of Obstructive Sleep Apnea Syndrome in Children"; and an Expert Panel on Drowsy Driving and Automobile Crashes with the Department of Transportation and the National Highway Traffic Safety Administration. The Center continues its collaboration with the National Aeronautics and Space Administration (NASA) to support research on sleep and microgravity as part of the Neurolab Project.

The Center works closely with the NHLBI Office of Prevention, Education, and Control (OPEC) on the national sleep education program.

In 1997, several new public and professional education materials were developed and disseminated. Radio and print public service announcements were used in a mass media campaign on sleep apnea; two fact sheets—one pertaining to restless legs syndrome and the other relating to narcolepsy—were made available on the NHLBI home page; a publication on problem sleepiness was developed in collaboration with the American Sleep Disorders Association (ASDA) that will be available in FY 1998 for primary care physicians; and a fact sheet on this topic was produced for the general public. *Drowsy Driving and Automobile Crashes*, a report of an expert panel, is presently being published. A document on insomnia, the results of another collaborative effort with the ASDA, is expected to be ready for publication next year. In addition, the Center is collaborating with the National Highway Traffic Safety Administration on a new education program targeting sleepy drivers. Future collaborations will include development of an education campaign; strategy workshops; and publications for teachers, parents, and students.

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 about 723, including about 359 doctoral-level scientists, 65 of whom are in tenured and tenure-track positions, one Nobel Laureate, and 6 members of the National Academy of Sciences. Approximately 150 guest workers contribute importantly to the research. This combined staff of about 700 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 OPEC 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 fourfold, and four times as many hypertensives are treating and controlling their disease. The most recent data from the National Health and Nutrition Examination Survey (NHANES III) indicate

that over the past four decades, mean systolic blood pressure has declined by 10 mm Hg. In addition, 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 and was accepted by the U.S. Dietary Guidelines Committee. In 1997, the "Report of the Joint National Committee on the Detection, Evaluation, and Treatment of High Blood Pressure" was updated and published in the *Archives of Internal Medicine.* The Report discusses the use of new drug therapies, management of special populations and situations, and patient advocacy and rights.

Additional program priorities include developing a network of organizations to advocate improved blood pressure control among older Americans; maintaining blood pressure control among elderly women (with special emphasis on preventing congestive heart failure), low-income and minority populations, and those who are underserved by the health care system; identifying partners, including the food industry, who can help implement population strategies for disease prevention; and 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. The Program has expanded its mass media campaign to include displaying messages on billboards in the inner city, posters on mass transit systems, and radio messages for urban inner-city populations. Members of the NHBPEP Coordinating Committee are serving as spokespersons on radio and TV.

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. The latest NHANES III data, released at the December 1996 NCEP Coordinating Committee meeting, 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 fat decreased significantly, resulting in impressive declines in average blood cholesterol levels and in the prevalence of high blood cholesterol in the U.S. population.

Results from three recent clinical trials provide conclusive evidence that cholesterol lowering dramatically reduces heart attacks and CHD deaths, and overall death rates in patients with or without existing CHD. As part of its focus on CHD patients, the NCEP developed a new physician monograph, *Cholesterol Lowering in the Patient with CHD,* to encourage physicians to lower cholesterol levels aggressively in these patients. In collaboration with the University of Texas Southwestern Medical Center at Dallas, the monograph will be distributed to 200,000 primary care physicians and cardiovascular specialists, together with a copy of the NCEP patient booklet, *Live Healthier, Live Longer—Lowering Cholesterol for the Person With Heart Disease.* As part of National Cholesterol Education Month in September, notices were placed in medical journals to alert physicians to this special mailing, and advertisements appeared in major newspapers to inform the public of the availability of the patient booklet.

The NCEP's prevention strategy uses public service announcements (PSAs) to encourage

individuals to adopt heart-heathy habits. They include eating a low saturated fat diet, engaging in physical activity, maintaining weight control, and having regular cholesterol level checkups.

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 controlled asthma.

Dissemination of national guidelines on diagnosis and management of asthma is a major program priority. In 1997, the NAEPP released the *Expert Panel Report 2: Guidelines for the Diagnosis and Management of Asthma.* This document, an update of the 1991 guidelines from the Expert Panel, provides the science base for the Program. A *Practical Guide to the Diagnosis and Management of Asthma* was also prepared to assist primary care physicians in implementing the recommendations in the guidelines. The recommendations for managing asthma are communicated to patients through a fact sheet.

The National Heart Attack Alert Program (NHAAP) was initiated in June 1991 to reduce morbidity and mortality from acute myocardial infarction (AMI), 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 AMI. 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 AMI manifestations. The NHAAP recently developed recommendations for health care providers in emergency departments about current and new tests/technologies for detecting AMI (including acute cardiac ischemia). It has written a document for providers of high-risk patients about educational strategies to reduce prehospital delay in patients at high risk for an AMI. An information sheet addressing community planning considerations to ensure access to timely and appropriate care of individuals with acute cardiac ischemia has been completed.

At a June 1996 retreat, the NHAAP Coordinating Committee identified several focus areas for increased program activity during the next 5 years. Included among them were evidence-based evaluation of diagnostic technologies, strategies, and protocols to identify acute cardiac ischemia, including non-ST-segment elevation MI; health care systems/community planning including all reimbursement systems (i.e., managed care, public, and private) and the uninsured; new information technologies; professional education; high-risk patient education; and patients discharged from emergency departments, ruled out for AMI; and general public/bystander education.

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. The OEI, as part of its strategy to focus on persons at high risk, 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. Its charge is to develop evidence-based clinical practice guidelines for use by primary health care providers. In collaboration with the NIDDK's 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, the panel has prepared a report that is expected to be released at the National Conference on Cardiovascular Health: Coming Together for the 21st Century, scheduled for February 1998.

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 adoles-

cents, 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 this 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. As the NHLBI developed new education and prevention programs, the role of the Committee was expanded. Today, it provides direct input to the NHLBI regarding development and implementation of all outreach and education projects specifically designed to improve the health status of minority populations.

In April 1997, the Ad Hoc Committee met to develop a 5-year strategic plan to reduce the burden of CVD among minority populations. The Committee's recommendations were broad in nature and ranged from involving an intended audience at the very inception of a project, to the role of technology in information dissemination. They will be used to identify directions for research to advance cardiovascular health promotion among minority populations.

The OPEC and the Office of Research on Minority Health (ORMH), NIH, are currently collaborating on several projects associated with improving cardiovascular health of minority populations. One such project is the National Physicians' Network, which encourages physicians who provide care to blacks to become more actively involved in prevention and education activities in black communities. The Latino CVD Prevention and Outreach Initiative, "Salud para su Corazon" (Health for Your Heart), is a comprehensive community-based health promotion project designed to raise awareness of CVD prevention and promote heart-healthy lifestyles among Latinos in the Washington, DC, metropolitan area. Evaluation results show significant gains in knowledge of cardiovascular health. This model project will provide the foundation for similar health campaigns in Latino communities across the Nation. A third project, Building Healthy Hearts for American Indians, is a pilot project to increase knowledge and promote heart health among this population. Health promotion activities and materials developed as a part of this project will address the cardiovascular health needs of American Indians by incorporating their cultural values, traditions, and lifestyles.

International Activities

The beginning of FY 1998 marks five decades of NHLBI research achievements. Since its beginning, the Institute has fostered a number of important international collaborations. As we approach the 21st century, the concept of the "global village" is rapidly becoming a reality, and technological advances, especially in telecommunications, are making international activities an increasingly significant component of the NHLBI national programs.

During the past 25 years, the NHLBI has participated in a series of government-to-government agreements to reduce mortality and morbidity from heart, lung, and blood diseases, which continue to affect hundreds of millions of people worldwide. The current burden of these diseases is highlighted in the 1996 World Health Organization/World Bank study, *The Global Burden of Disease*. The costs associated with them amount to hundreds of billions of dollars annually, and are projected to increase dramatically over the next 20 years. Through joint participation, the NHLBI collaborates with corresponding institutes nationally and internationally on 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. For example, the NHLBI's guidelines on hypertension, cholesterol, and asthma have been translated into many languages for adaptation and use in other countries. The results of a number of comparative multinational studies have been published with the assistance and support of the NHLBI. These studies highlight opportunities for

preventing CVD even in the absence of a precise understanding of etiologies.

Presently, the NHLBI collaborates with more than 20 countries including Russia, China, Japan, Germany, Italy, Poland, Czech Republic, Kyrgyzstan, Georgia, Egypt, Pakistan, Korea, Australia, Vietnam, and South Africa. During FY 1997, the NHLBI international programs included exchanges of scientists and data, joint research projects, comparisons of epidemiological data, joint working meetings, and joint publications. These activities contribute to the NHLBI's plans for the future of national programs since rapid progress in science, together with the speed of telecommunications and dramatic improvements in the international political climate combine to create a framework for new opportunities for joint research.

The Institute has assumed an international leadership role in key areas related to the NHLBI mission. NHLBI staff serve as consultants to the World Health Organization (WHO), the Pan American Health Organization (PAHO), and other international organizations and contribute to worldwide plans for the prevention and control of cardiovascular, pulmonary, and blood diseases in both developed and developing countries. 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. New collaborations with the PAHO in cardiovascular diseases have been initiated to celebrate the 50th anniversary of the NHLBI and the WHO during FY 1998.

In the area of blood diseases, collaboration on aplastic anemia with Vietnam developed new momentum during FY 1997. A joint publication on the "High prevalence of GB virus C/hepatitis G virus in healthy persons in Ho Chi Minh City, Vietnam" appeared in the *Journal of Infectious Diseases* in February 1997. Viremia with the novel hepatitis agent appears to be very common among normal individuals in Vietnam. This finding has important implications for screening tests on the blood supply and for continued research on aplastic anemia.

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

The NHLBI is actively participating in Gore-Chernomyrdin Commission efforts to improve health care through joint projects in prevention of cardiovascular and pulmonary diseases. The Institute's contributions build on the success of the NHBPEP and the NAEPP. The strategies of the Institute's NAEPP were tested and adapted to the cultural and economic conditions of post-Soviet Russia with promising results.

Contacts with Africa are also being developed, particularly with South Africa. The Director, NHLBI, was the keynote speaker, as well as a panel discussant, at a regional South African Conference in Cape Town in December 1996. In addition, the NHLBI; the Office of International Health, Department of Health and Human Services; the University of Cape Town; and the South African Medical Research Council jointly sponsored the First U.S.-South African Workshop on Hypertension in Blacks held in Cape Town in December 1996. The workshop provided U.S. and South African investigators with an opportunity to explore research topics of mutual interest and benefit and to develop plans for future collaboration in hypertension in black populations. The U.S. delegation to the workshop was led by the Coordinator, National High Blood Pressure Education Program, NHLBI, and included experts on diagnosis, prevention, and treatment of hypertension in blacks.

During FY 1997, the Institute continued to develop contacts with scientists in the Middle East. Building upon prior U.S.-Egypt collaboration, a second Pan Arab Conference on Hypertension was held in Lebanon; a third conference is planned for Saudi Arabia.

Over the past 5 years, a number of NHLBI grantees have successfully competed for funds under the Fogarty International Research Collaborative Awards (FIRCA) Program to extend their research to another country. NHLBI parent grants have included FIRCA collaborations with counterparts in Uganda, Uruguay, Mexico, Hungary, Romania, Ukraine, Bulgaria, India, and Turkey.

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 Followup Program, 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 Hypertension Detection and Followup Program, "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-1) 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) produced by recombinant means 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 is initiated to increase health care provider awareness about clinical opportunities for smoking cessation programs, techniques for use within health care settings, and resources for use within communities to expand and reinforce such efforts.

November 1985. The NHLBI inaugurates the National Cholesterol Education Program (NCEP) to increase awareness among health professionals

and the public that elevated blood cholesterol is a cause of CHD and that reducing elevated blood cholesterol levels will contribute to the reduction of CHD.

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

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

December 17, 1986. The citizens of Framingham, Massachusetts, are presented a tribute by the Assistant Secretary 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 Native American 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 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 to reduce premature morbidity and mortality from acute myocardial infarction 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 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 supplemental issue of *Medicine and Science in Sports and Exercise.*

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

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

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

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

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

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 at the accompanying press conference.

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 findings from two studies that show lifestyle changes, such as modifying one's diet and losing weight, substantially reduce blood pressure in adults and can keep older patients off antihypertensive medication.

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, low-density lipoprotein, 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 released 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.

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 1996 cardiovascular, lung, and blood diseases accounted for 1,180,000 deaths and 51 percent of all deaths in the United States (p. 34). The projected economic cost in 1998 for these diseases is expected to be $406 billion, 25 percent of the total economic costs of illness, injuries, and death (p. 49). Of all diseases, heart disease is the leading cause of death, cerebrovascular disease is third (behind cancer), and COPD ranks fourth (p. 37). Cardiovascular and lung diseases account for 3 of the 5 leading causes of death (p. 37) and 4 of the 5 leading causes of infant deaths (p. 43). Hypertension, heart disease, asthma, and chronic bronchitis are especially prevalent and account for substantial morbidity in Americans of all ages (p. 45). Increases in prevalence have been greatest for asthma and congestive heart failure.

The purpose of 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.

Cardiovascular Diseases

- Cardiovascular diseases caused 955,000 deaths in 1996, 41 percent of all deaths (p. 34).
- Heart disease is the leading cause of death; the main form is CHD, which caused 477,000 deaths in 1996 (pp. 35, 37).
- Cerebrovascular disease is the third leading cause of death (p. 37). It caused 160,000 deaths in 1996 (p. 35).
- The annual number of deaths from CVD increased substantially between 1900 and 1970 (p. 36). 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. 36).
- The percentage of all deaths due to CVD increased from 15 in 1900 to more than 50 in 1950, and after reaching a peak of 55 in 1962, declined to 41 in 1995 (p. 37).
- In 1950, heart disease caused 2½ times as many deaths as the second leading cause of death, cancer. Because of the precipitous decline in the crude death rate for heart disease, by 1996 it caused only 35 percent more deaths than cancer (p. 37).
- The age-adjusted death rate for total CVD declined 59 percent between 1950 and 1996, contributing to a 73 percent decline in total mortality (p. 38).
- 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 rate 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. 36, 38).

- The rapid increase in deaths due to congestive heart failure between 1968 and 1995 is a major exception to the mortality decline in cardiovascular diseases (p. 38).
- While heart disease and stroke mortality declined in most age, gender, race, ethnic, and geographic groups, progress has been slower among minorities than in the white population (p. 39).
- Because of the rapid decline in mortality from CHD since the peak in 1963, there were 621,000 fewer deaths from CHD in 1996 than would have occurred if there had been no decline (p. 40).
- Substantial improvements have been made in the treatment of cardiovascular diseases. Since 1970, case-fatality rates for hospitalized CHD, stroke, and congestive heart failure patients declined appreciably (p. 40).
- The decline in CHD mortality began earlier in the United States than in most countries, and in the 1970s and 1980s it outpaced that in most countries (only selected countries are shown, p. 41).
- Between 1985 and 1995, the percent decline in death rates for CHD was greatest among white males and least among black females (p. 42).
- An estimated 58.2 million persons in the United States have some form of CVD; most (50 million) have hypertension, but nearly 14 million have CHD (p. 45).
- Since the 1960s, there has been a substantial reduction in the prevalence of hypertension, smoking, and cholesterol, but not overweight (p. 46).
- Hypertension is a highly prevalent condition that is more common in blacks than in whites (p. 47).
- Awareness, treatment, and control of hypertension improved appreciably since 1971-72 (p. 47).
- Rates of hospitalization for congestive heart failure increased between 1971 and 1995 (p. 48).
- The estimate of economic cost of CVD is expected to be $274 billion in 1998:
  - $171 billion in direct health expenditures.
  - $25 billion in indirect cost of morbidity.
  - $78 billion in indirect cost of mortality (p. 49).

Lung Diseases

- Lung diseases, excluding lung cancer, caused an estimated 227,000 deaths in 1996 (p. 34).
- Chronic obstructive pulmonary disease caused 100,000 deaths in 1996 and is the fourth leading cause of death (pp. 35, 37).
- Between 1985 and 1995, the percent increase in death rates for COPD and asthma was greater in women than in men. For COPD, the rate declined in white men (p. 42).
- Between 1979 and 1996, infant death rates for the various lung diseases declined substantially (p. 42).
- The four leading causes of infant mortality are lung diseases or have a lung disease component (p. 43). Rates declined between 1986 and 1996 for three of them (not in the chart):
  - Congenital anomalies (-25%)
  - Disorders of short gestation (+10%)
  - Sudden infant death syndrome (-47%)
  - Respiratory distress syndrome (-61%).
- Lung diseases accounted for 45 percent of all deaths under 1 year of age in 1996 (p. 43).
- Trends in COPD mortality in the United States are increasing rapidly in women and are flat in 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. 44).
- Asthma is a common chronic condition, particularly in children. Prevalence and mortality continue to increase (pp. 35, 45, 46, 48).
- 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 266,000 deaths, 11 percent of all deaths, were attributed to diseases of the blood in 1996. This includes:
  - 257,000 due to blood clotting disorders.
  - 7,000 to diseases of the red blood cell.
  - 2,000 to bleeding disorders (pp. 34, 35).
- A large proportion of deaths from acute myocardial infarction and cerebrovascular disease involve blood-clotting problems (p. 35). Mortality trends are downward.
- In 1998, blood-clotting disorders will cost the Nation's economy $68 billion, and other blood diseases will cost $10 billion (p. 49).
- 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).
- In 1989, 13 million units of blood were collected from almost 9 million donors (not shown).
- In 1989, approximately 20 million units of blood products were transfused to 4 million patients (not shown).

Deaths From All Causes and Deaths From Cardiovascular, Lung, and Blood Diseases, U.S., 1976 and 1996

Cause of Death	1976 Number of Deaths	1976 Percent of Total	1996 Number of Deaths	1996 Percent of Total
All Causes	1,909,000	100	2,322,000	100
All Cardiovascular, Lung, and Blood Diseases	1,138,000	60	1,180,000	51
Cardiovascular Diseases (CVD)	991,000	52	955,000	41
Blood	380,000*	20	266,000‡	11
Lung	155,000†	8	227,000†	10
All Other Causes	771,000	40	1,143,000	49

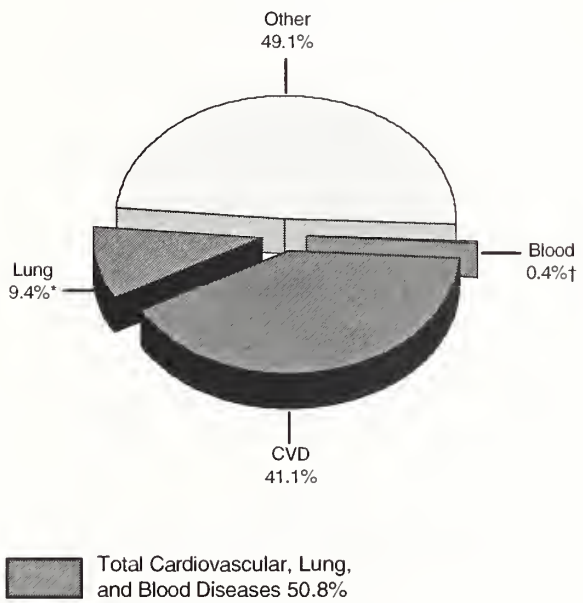
* Includes 375,000 CVD deaths involving blood clotting.

† Includes 13,000 CVD deaths due to pulmonary heart disease in 1976 and 12,000 in 1996.

‡ Includes 257,000 CVD deaths involving blood-clotting disease.

Source: Vital statistics of the U.S., National Center for Health Statistics (NCHS). Figures for 1995 are estimated by the NHLBI.

Deaths by Major Causes, U.S., 1996

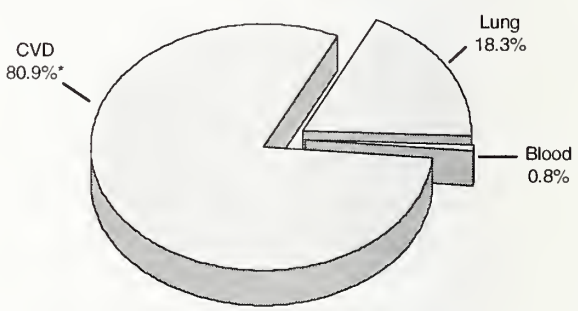


* Excludes deaths from pulmonary heart disease.

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

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

Deaths From Cardiovascular, Lung, and Blood Disease, U.S., 1996



* CVD involving blood clotting (21.8%).

Deaths From Specific Cardiovascular, Lung, and Blood Diseases, U.S., 1996

Cause of Death	Deaths (Thousands)		
	Cardiovascular	Lung	Blood
Acute Myocardial Infarction (AMI)	214	—	146*
Other Coronary Heart Disease (CHD)	263	—	—
Cerebrovascular Diseases (Stroke)	160	—	99*
Other Atherosclerosis	44	—	3*
Pulmonary Embolism	9	9*	9*
Other Cardiovascular Diseases	265	2*	—
Diseases of the Red Blood Cell	—	—	7
Bleeding Disorders	—	—	2
Chronic Obstructive Pulmonary Disease	—	100	—
Asthma	—	6	—
Other Airway Diseases	—	1	—
Pneumonia and Influenza	—	83	—
Neonatal Pulmonary Disorders	—	13	—
Interstitial and Inhalation Lung Diseases	—	8	—
Other Lung Diseases	—	5	
Total†	**955**	**227**	**266**

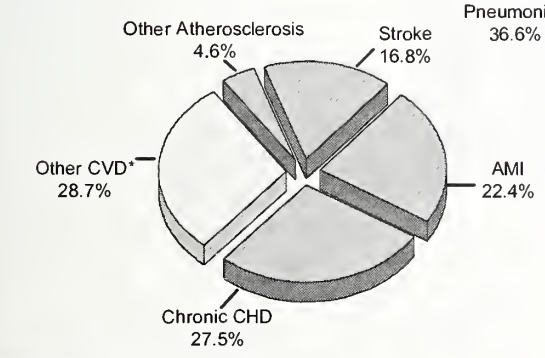
* Deaths from clotting or pulmonary disorders also included as cardiovascular deaths.

† Numbers may not add to total due to rounding.

Note: Total, excluding overlap, is 1,180,000.

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

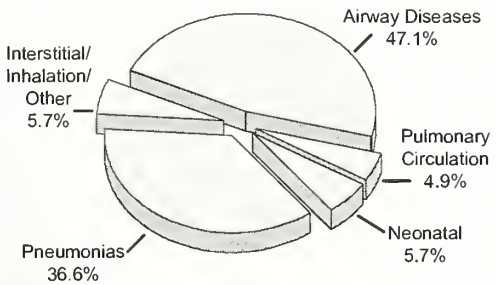
Deaths From Cardiovascular Diseases, U.S., 1996



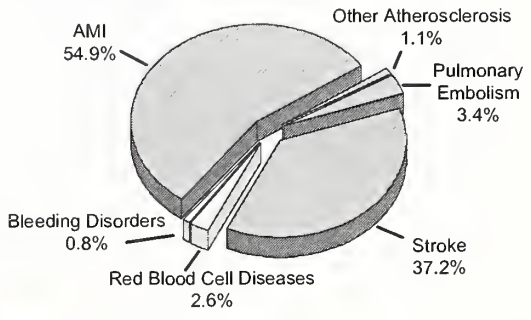
Atherosclerosis-Related Diseases 71.3%

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

Deaths From Lung Diseases, U.S., 1996



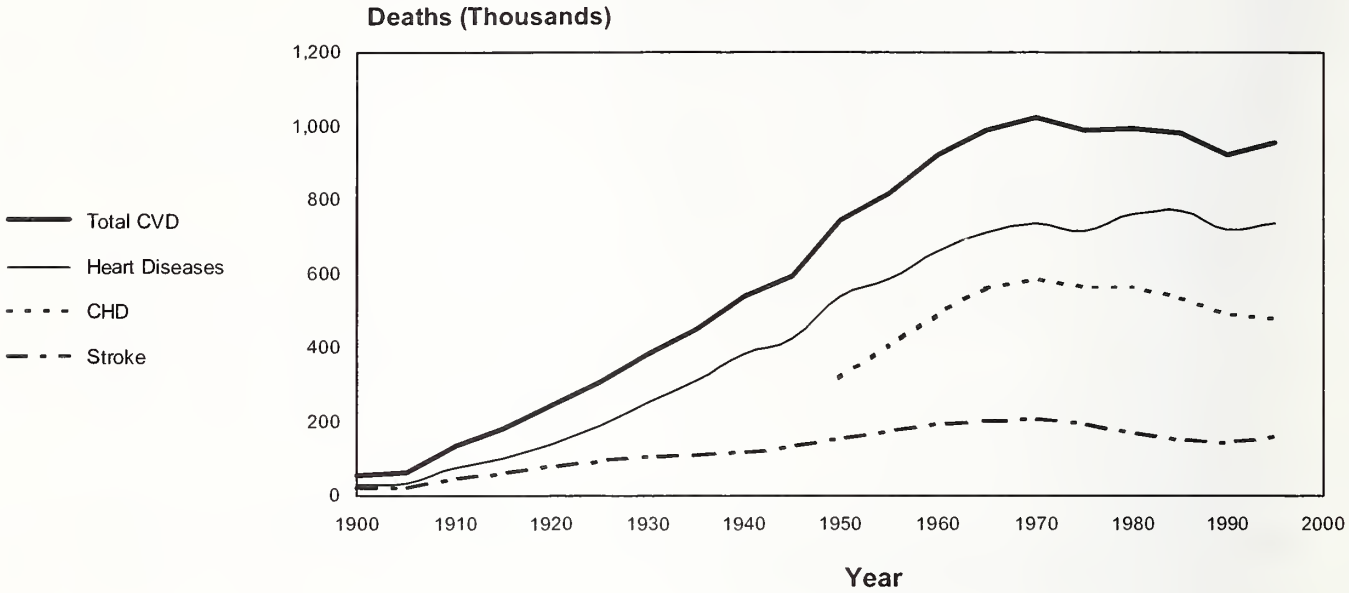
Deaths From Blood Diseases, U.S., 1996



Blood-Clotting Disorders 96.6%

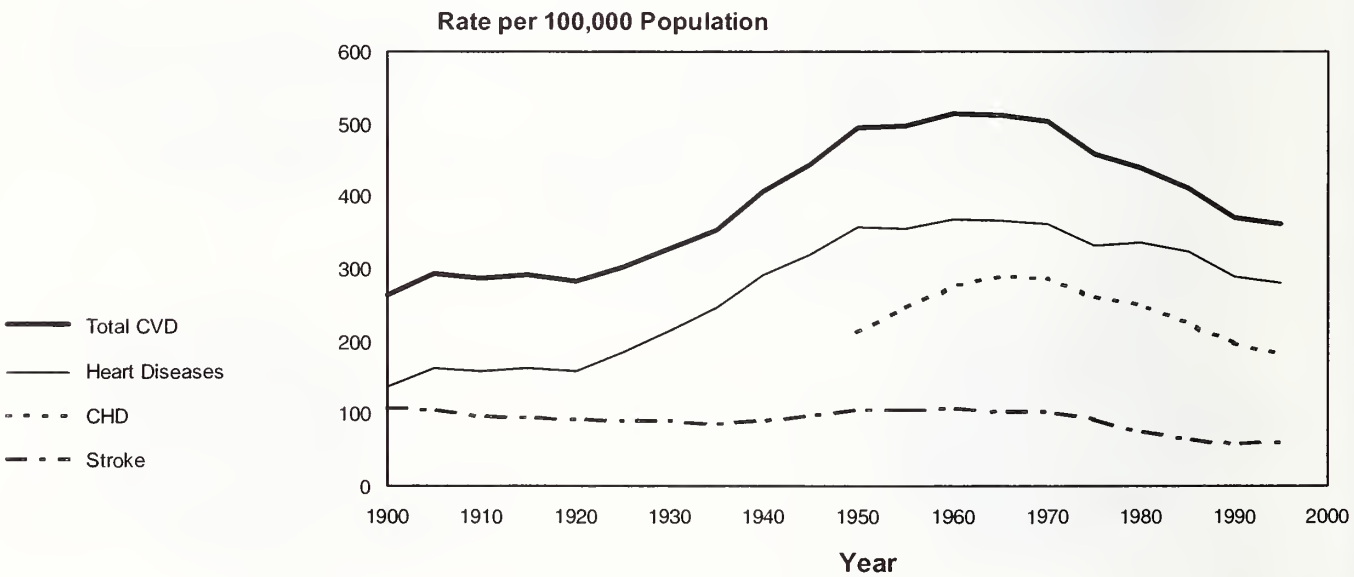
Source: Vital statistics of the U.S., NCHS. Figures shown are estimated by the NHLBI.

Deaths From Cardiovascular Diseases, U.S., 1900-95



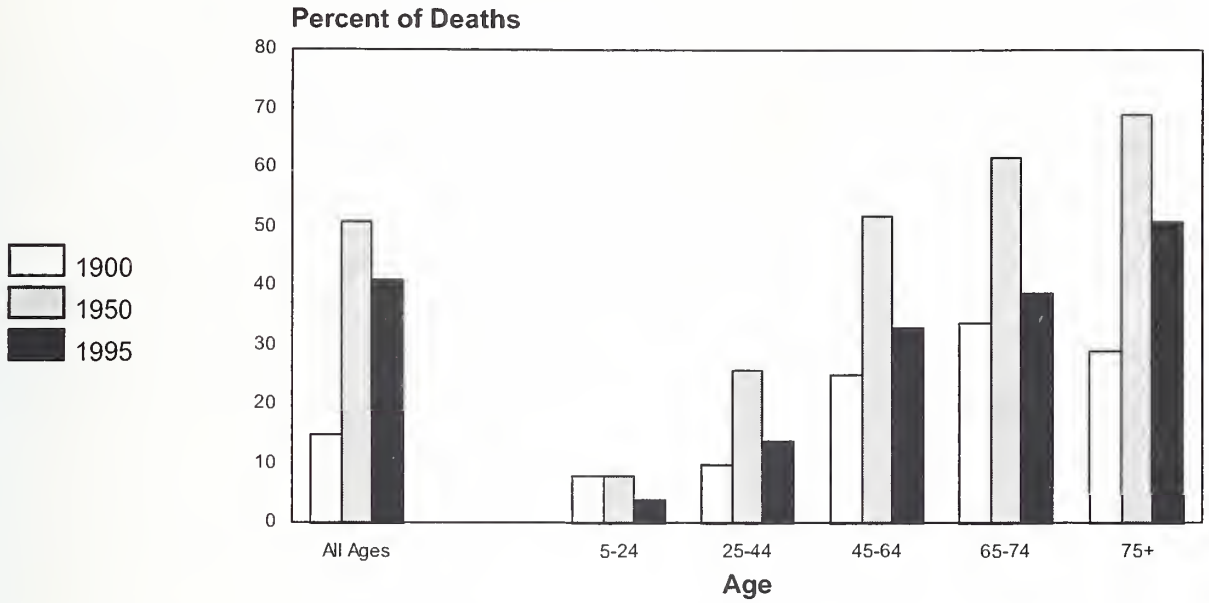
Source: Vital statistics of the U.S., NCHS.

Death Rates* for Cardiovascular Diseases, U.S., 1900-95



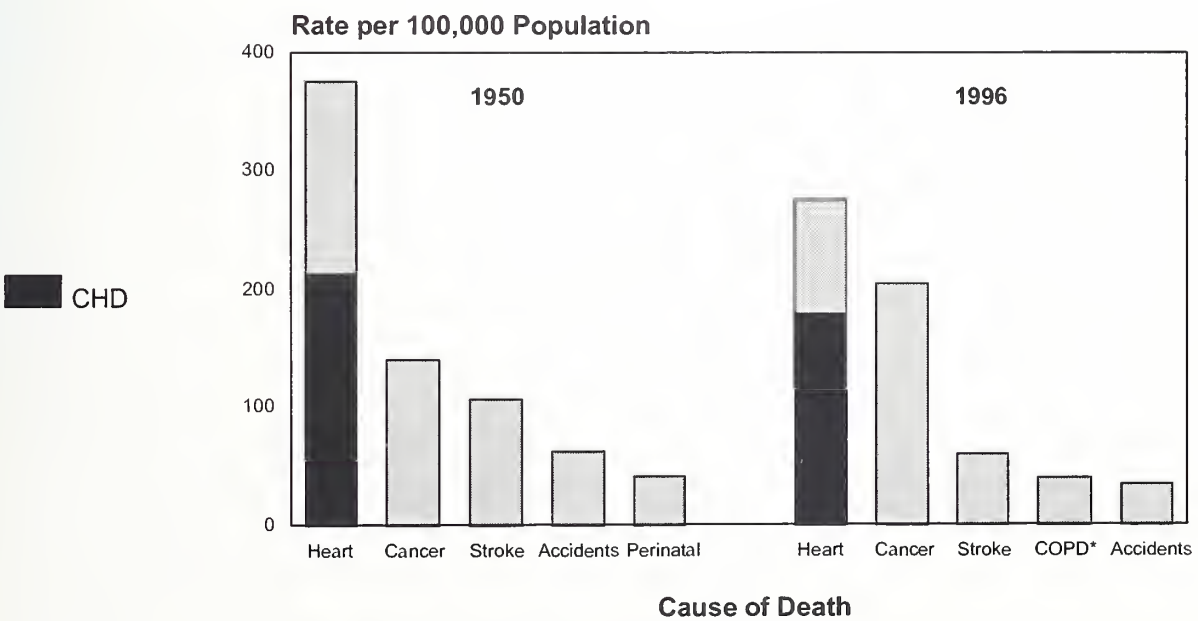
* Not age-adjusted.
Source: Vital statistics of the U.S., NCHS.

Deaths From Cardiovascular Diseases by Age, U.S., 1900, 1950, and 1995



Source: Vital statistics of the U.S., NCHS. Data for 1995 are estimated by the NHLBI.

The Five Leading Causes of Death, U.S., 1950 and 1996



* COPD and allied conditions (including asthma).
Source: Vital statistics of the U.S., NCHS. Data are provisional for 1996.

Death Rates for Cardiovascular and Noncardiovascular Diseases, U.S., 1950 and 1996

Rates of Decline and Contributions to the Total Decline by Cardiovascular Diseases and Noncardiovascular Diseases

Cause of Death	Rate* 1950	Rate* 1996†	Rate Decline	Percent Decline	Percent Contribution to Total Decline
All Causes	842	494	348	41	100
Cardiovascular Diseases	426	172	254	59	73
Heart Disease	308	135	173	56	50
Stroke	89	26	63	70	18
Other	29	11	18	62	5
Noncardiovascular Diseases	416	322	94	23	27

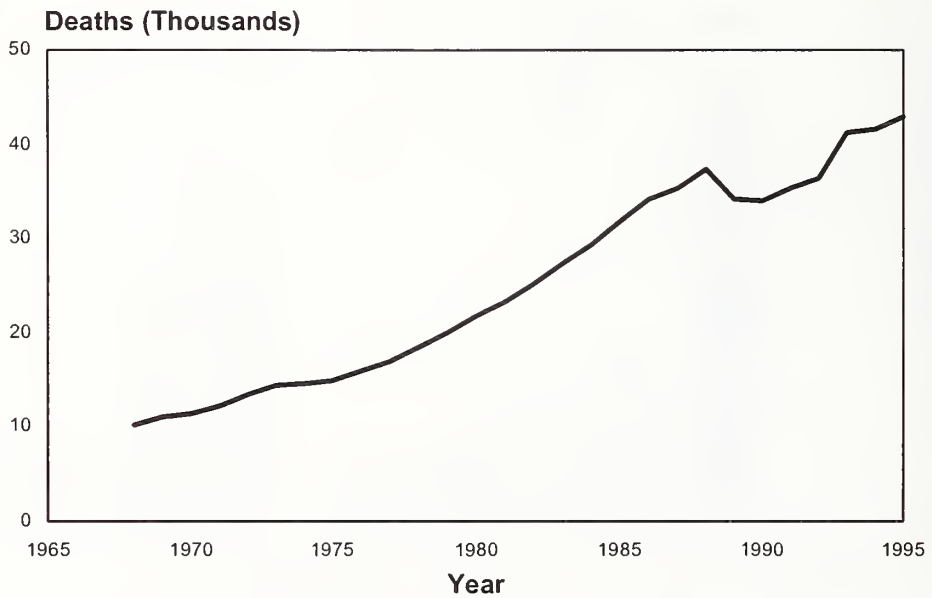
* Age-adjusted rate per 100,000 population.

† Data for 1996 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., 1968-95



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, U.S., 1985 and 1995

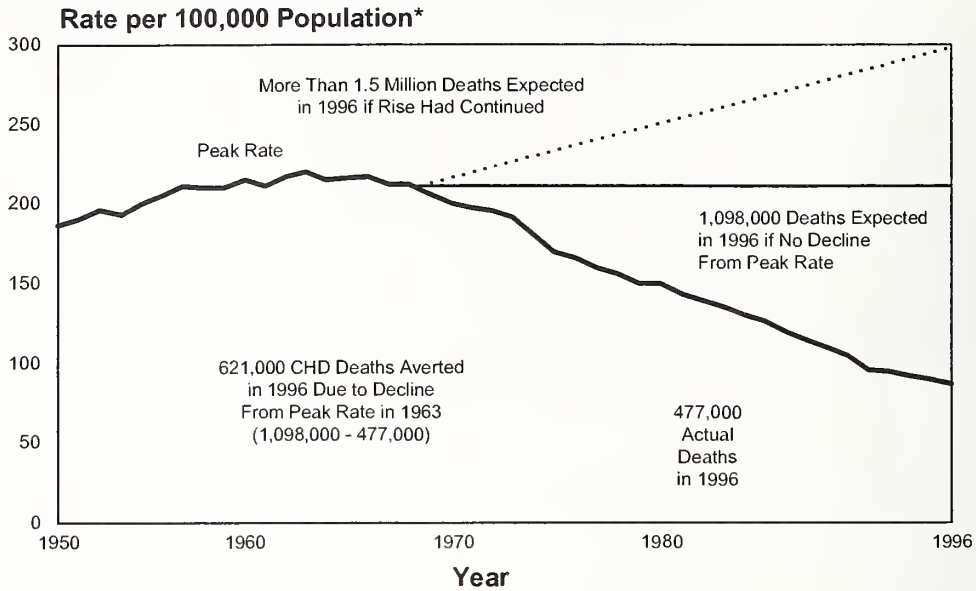
* Age-adjusted to the 1940 U.S. population.
Source: Vital statistics of the U.S., NCHS.

Death Rates* for Stroke by Gender, Race, and Ethnicity, U.S., 1985 and 1995

* Age-adjusted to the 1940 U.S. population.
Source: Vital statistics of the U.S., NCHS.

Death Rates for Coronary Heart Disease, U.S., 1950-96

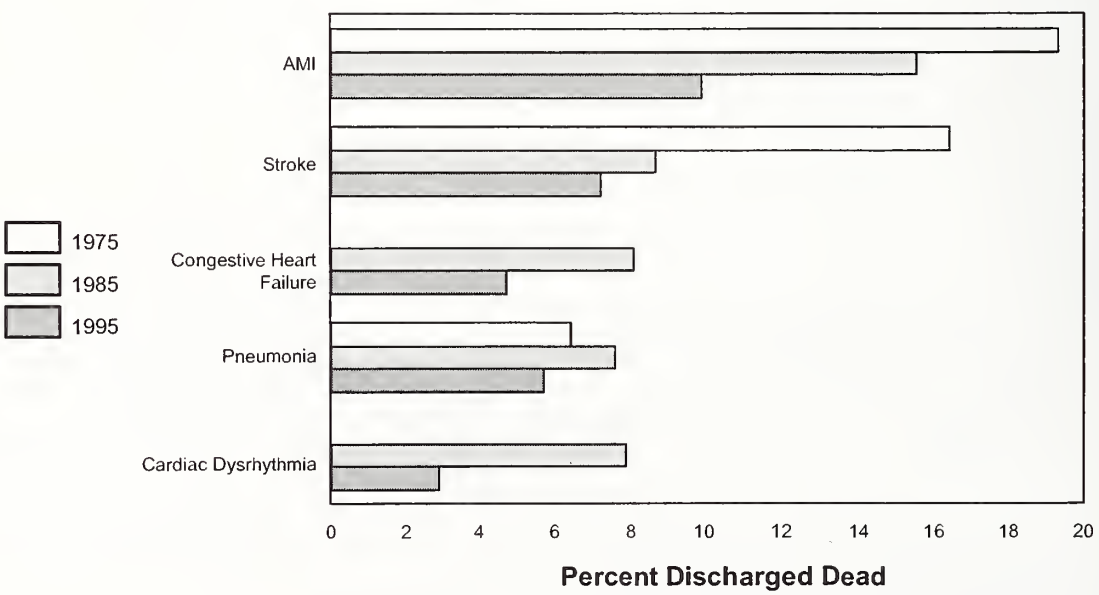
Actual Rate and Expected Rates if Rise Had Continued or Reached a Plateau



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

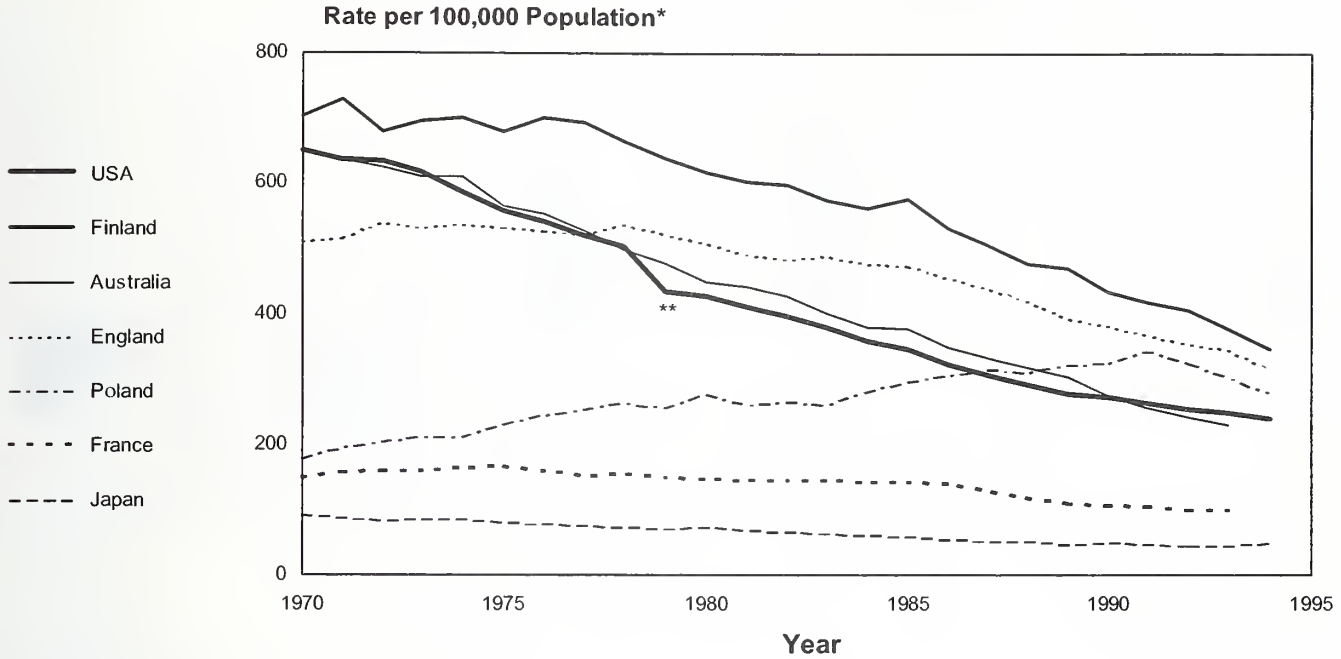
Source: Vital statistics of the U.S., NCHS. Data for 1996 are provisional.

Common Cardiovascular and Lung Diseases With High Percentage Discharged Dead From Hospitals, U.S., 1975, 1985, and 1995



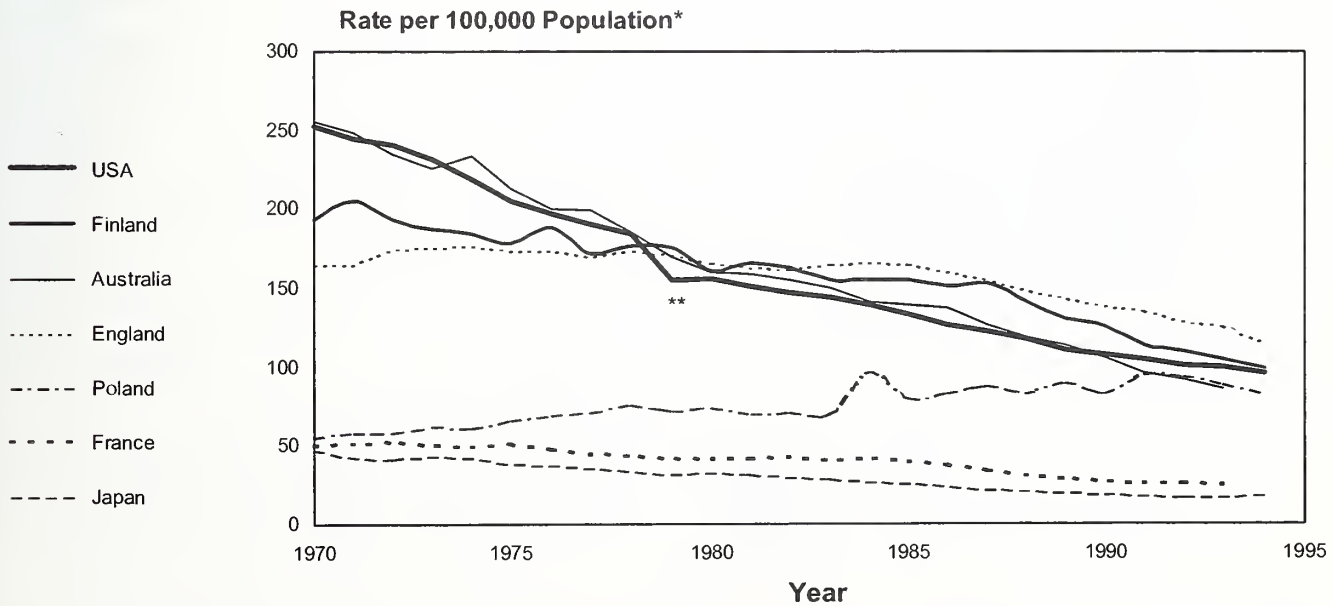
Source: National Hospital Discharge Survey, NCHS.

Death Rates for Coronary Heart Disease in Men 35-74 Years, Selected Countries, 1970-94



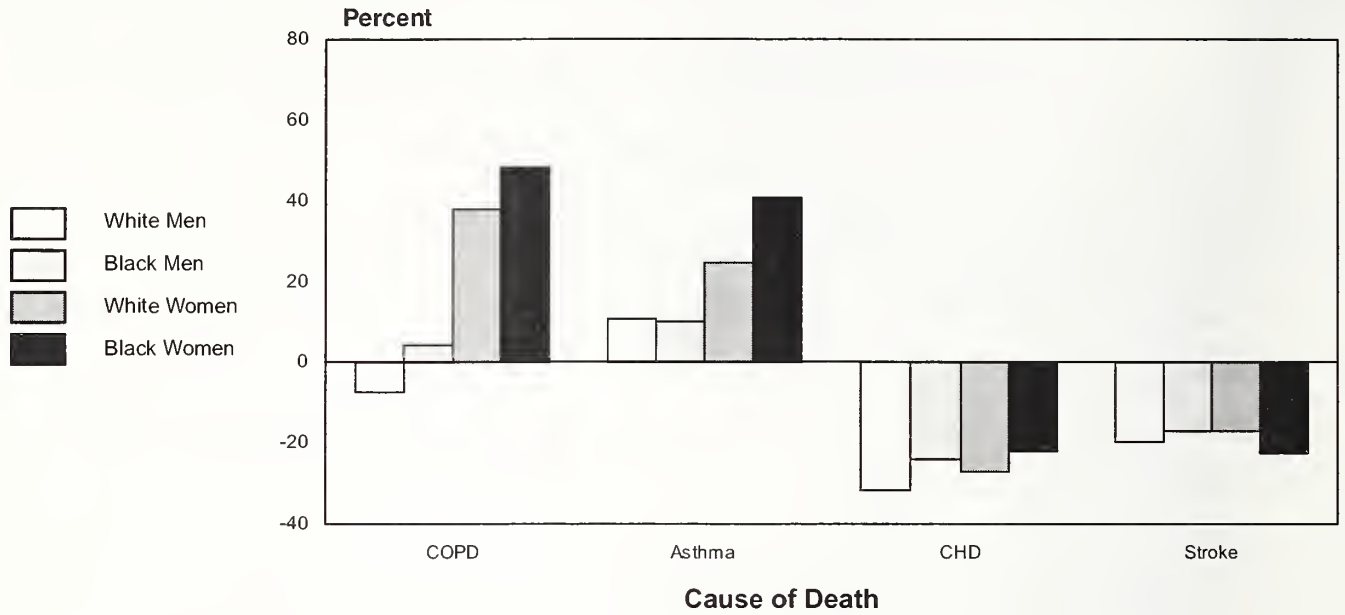
* Age-adjusted to the European Standard Population.
** The sudden decline is due to revision in the International Classification of Diseases in 1979.
Source: World Health Statistics Annual, WHO.

Death Rates for Coronary Heart Disease in Women 35-74 Years, Selected Countries, 1970-94



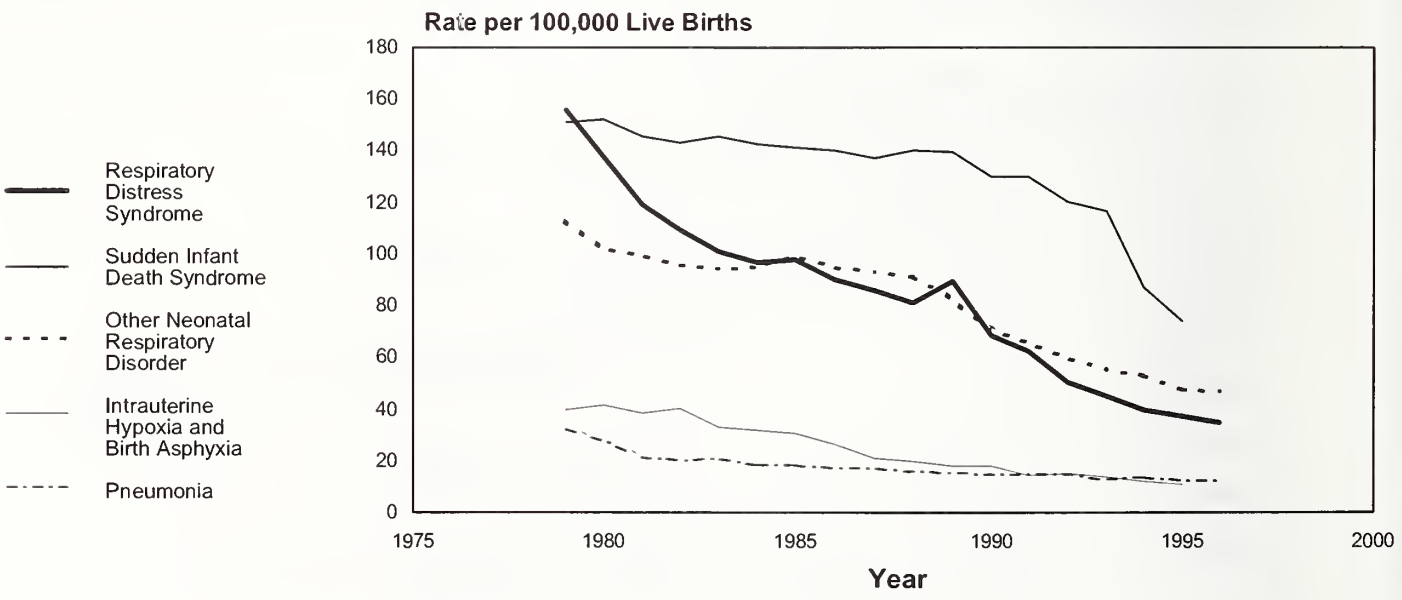
* Age-adjusted to the European Standard Population.
** The sudden decline is due to revision in the International Classification of Diseases in 1979.
Source: World Health Statistics Annual, WHO.

Change in Death Rates* for Selected Causes by Race and Gender, U.S., 1985-95



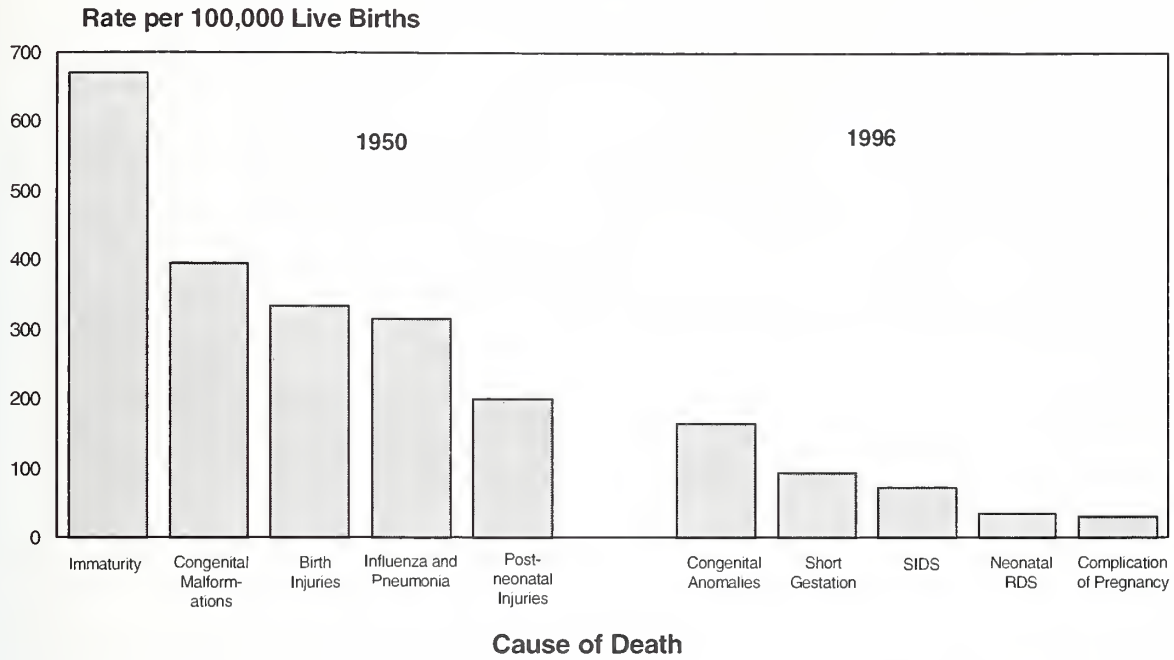
* Age-adjusted to the 1940 U.S. population.
Source: Vital statistics of the U.S., NCHS.

Death Rates for Lung Diseases in Infants, U.S., 1979-96



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

The Five Leading Causes of Infant Death, U.S., 1950 and 1996



Source: Vital statistics of the U.S., NCHS. Data for 1996 are provisional.

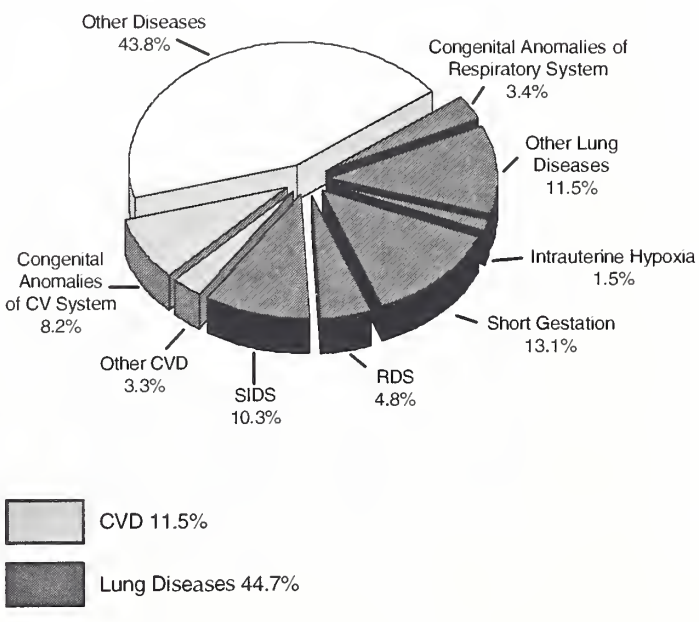
Deaths Under Age 1 Year Due to Cardiovascular and Lung Diseases, U.S., 1996

Cause of Death	Deaths Under Age 1
All Causes	28,200
Cardiovascular Diseases	3,243
Congenital Anomalies	2,299*
Other	944*
Lung Diseases	12,609
Sudden Infant Death Syndrome (SIDS)	2,906
Respiratory Distress Syndrome (RDS)	1,368*
Short Gestation	3,706*
Intrauterine Hypoxia	429
Congenital Anomalies	960*
Other Lung Diseases	3,240†
Other Diseases	12,348

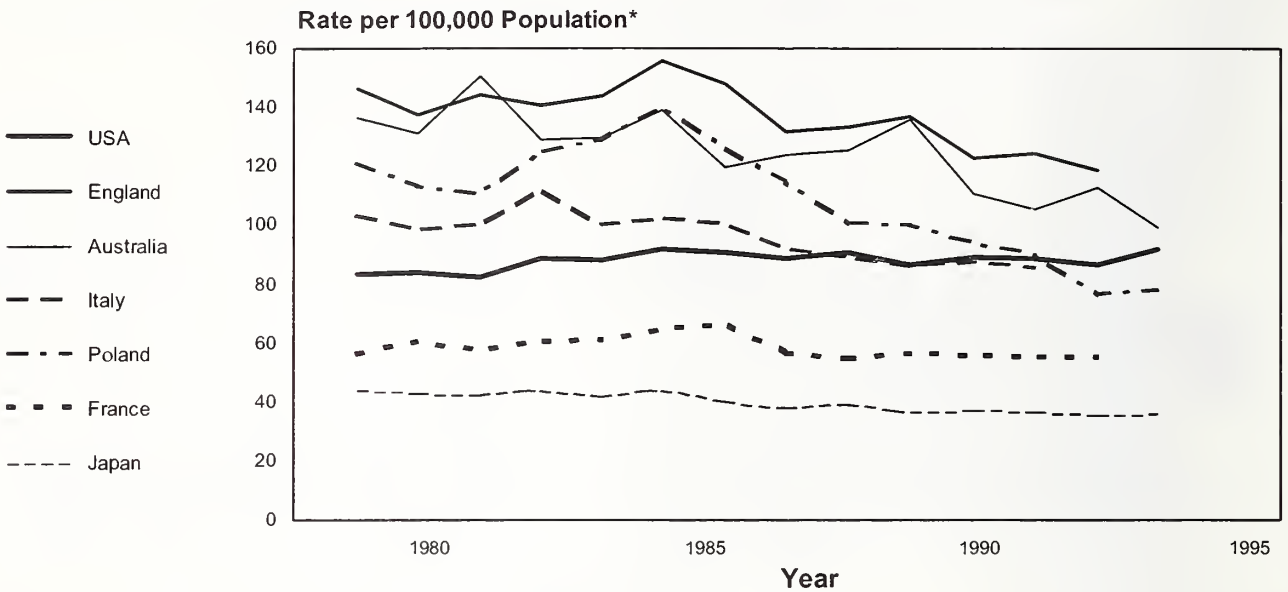
* NHLBI programs address these diseases.

† NHLBI programs address diseases that caused 1,122 of these deaths.

Source: Estimated by the NHLBI from final 1995 and provisional 1996 vital statistics of the U.S., NCHS.

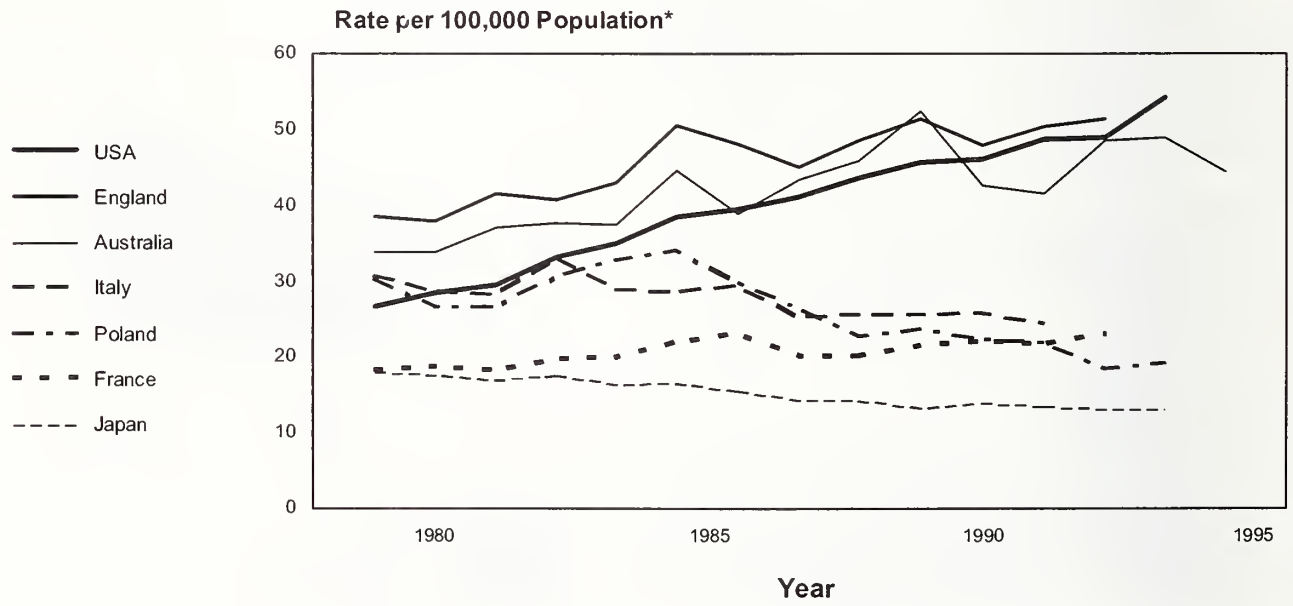


Death Rates for Chronic Obstructive Pulmonary Disease in Men 35-74 Years, Selected Countries, 1980-94



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

Death Rates for Chronic Obstructive Pulmonary Disease in Women 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., 1995

Disease	Number
Total Cardiovascular Diseases	58,200,000
Hypertension*	50,000,000
Coronary Heart Disease	13,900,000
Arrhythmias	4,300,000
Congestive Heart Failure	4,900,000
Rheumatic Heart Disease	1,800,000
Cerebrovascular Diseases	4,000,000
Hardening of Arteries	1,800,000
Congenital Heart Disease	1,000,000
Asthma	14,900,000
Chronic Bronchitis	14,500,000
Emphysema	1,900,000
Anemias† (all forms)	4,200,000

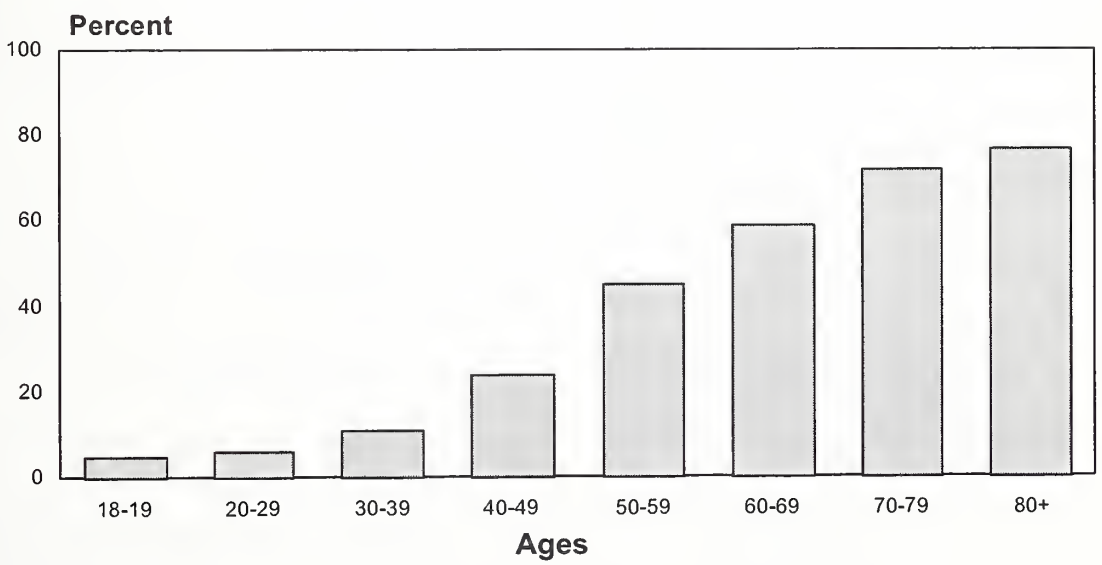
* Systolic blood pressure 160 mm Hg or greater and/or diastolic 90 or greater or on antihypertensive medication.

† Persons with more than one form of anemia are counted more than once.

Note: Some persons are included in more than one diagnostic group.

Sources: Extrapolated to United States from National Health and Nutrition Examination Survey (NHANES), 1988-91, and National Health Interview Survey (NHIS), 1995.

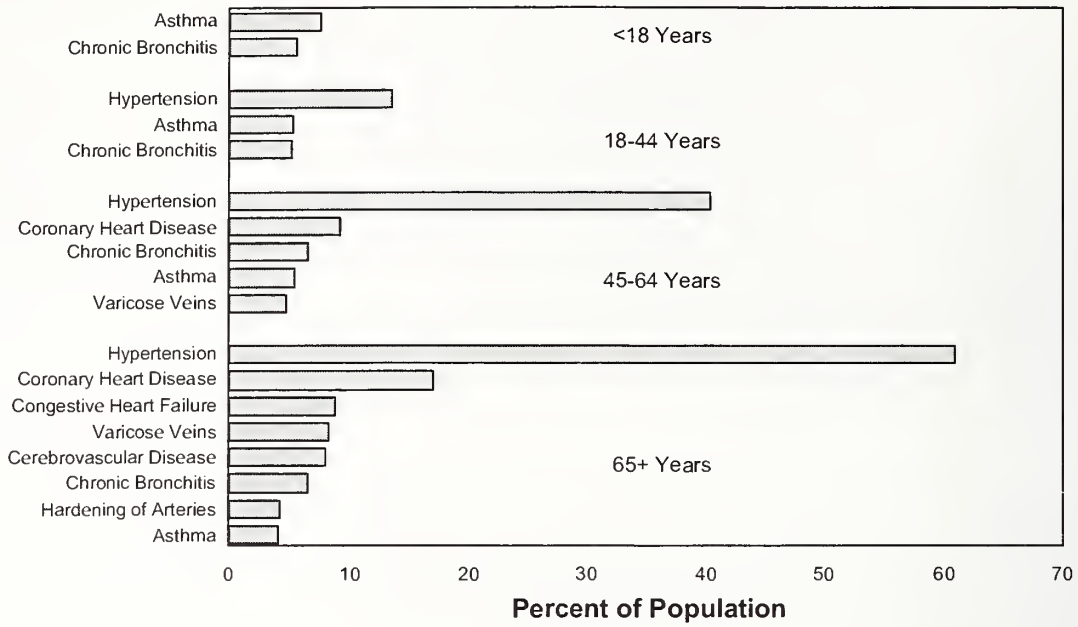
Prevalence of Cardiovascular Diseases* in Adults by Age, U.S., 1988-91



* Hypertension, coronary heart disease, cerebrovascular disease, congestive heart failure, and/or rheumatic heart disease. Hypertension = 140/90+ or on medication.

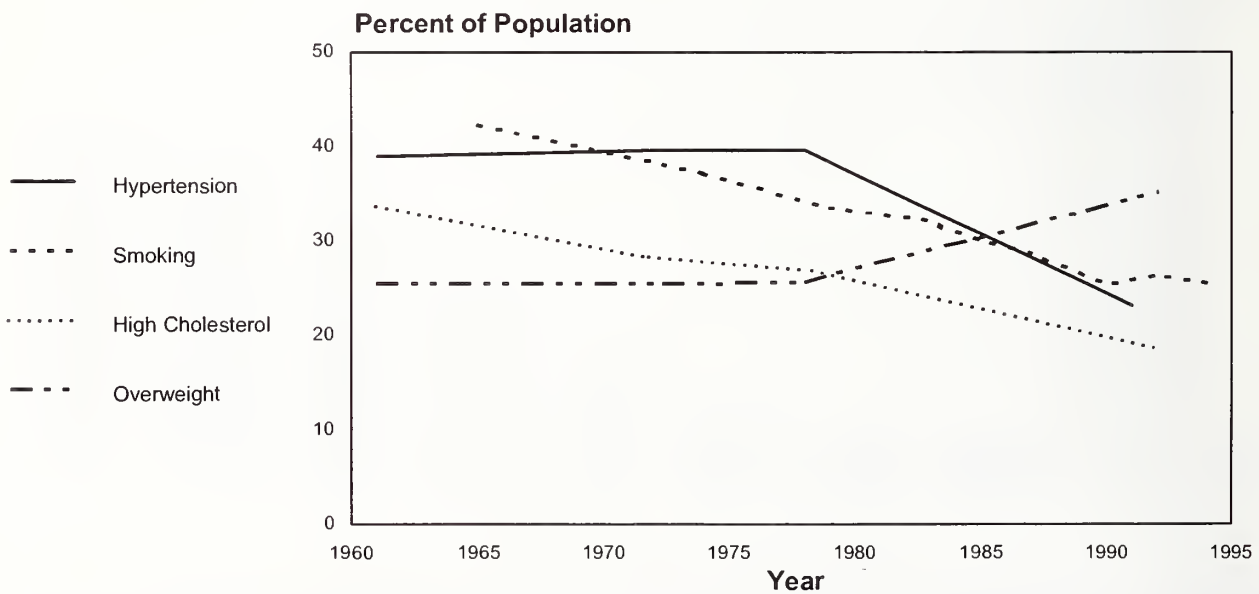
Source: NHANES, 1988-91.

Prevalence of Common Cardiovascular and Lung Diseases by Age, U.S., 1995



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

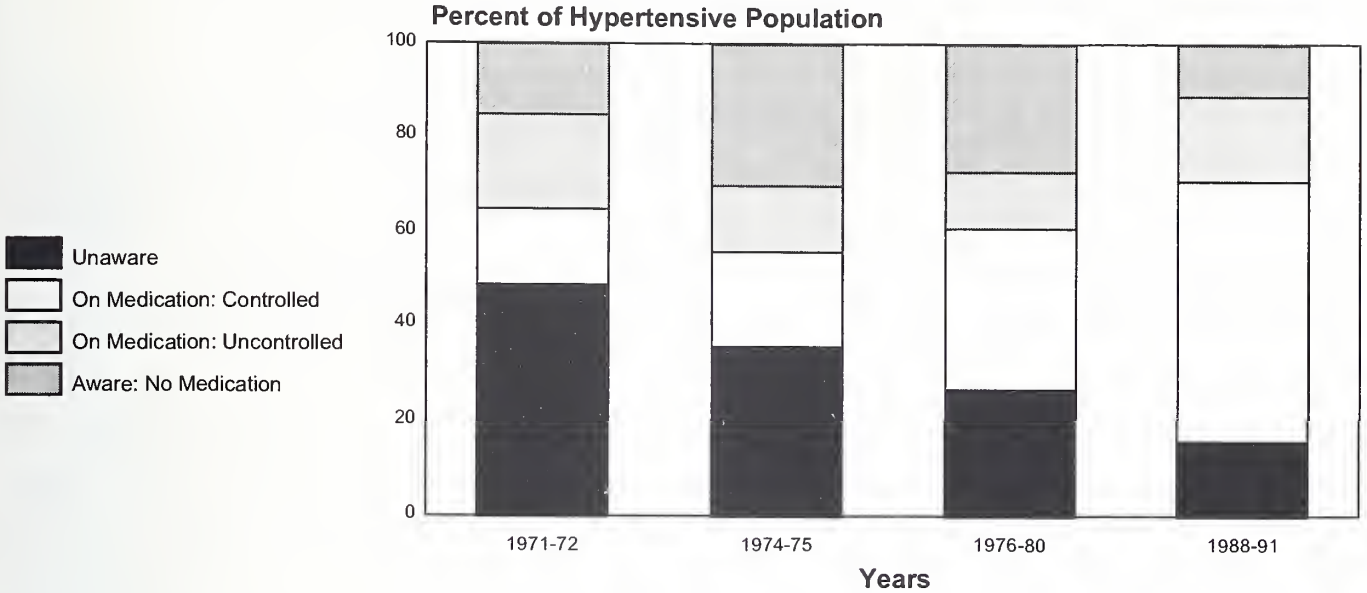
Prevalence of Cardiovascular Disease Risk Factors, U.S., 1960-94



Hypertension is blood pressure 140/90 + mmHg or on medication. Total serum cholesterol is 240+ mg/dl. Overweight is BMI 27.8+ kg/m^2 for men and 27.3+ for women.

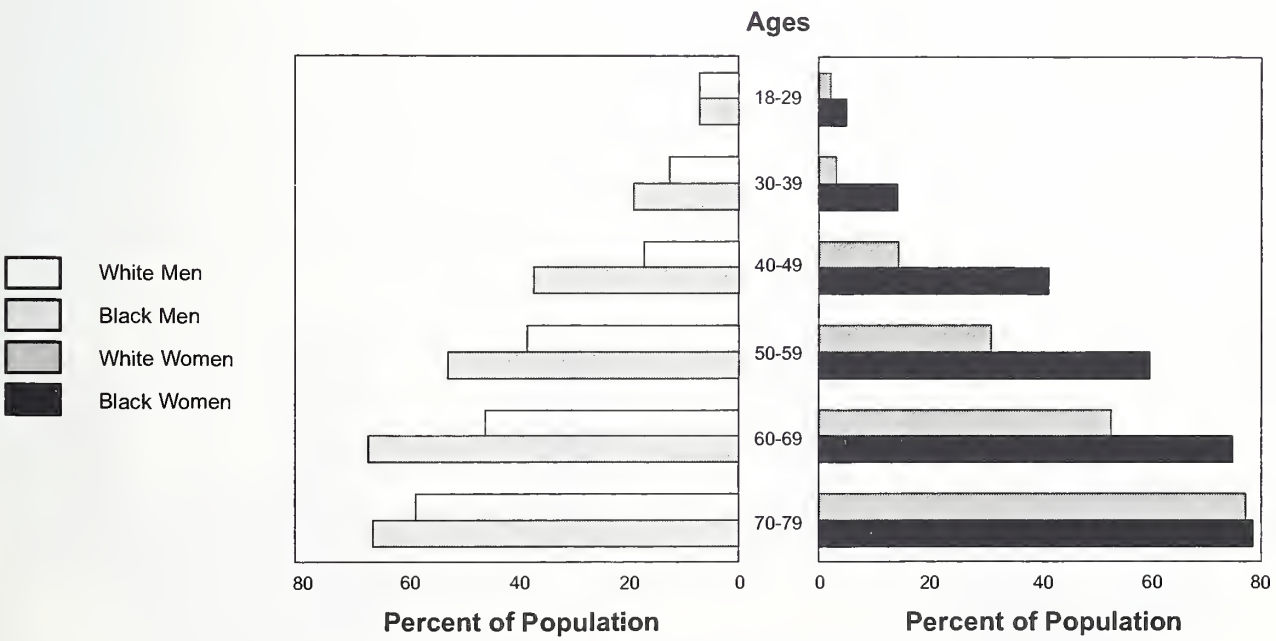
Source: NHIS for smoking and NHANES for the other risk factors.

Hypertensive Population* Aware, Treated, and Controlled, U.S., 1971-72 to 1988-91



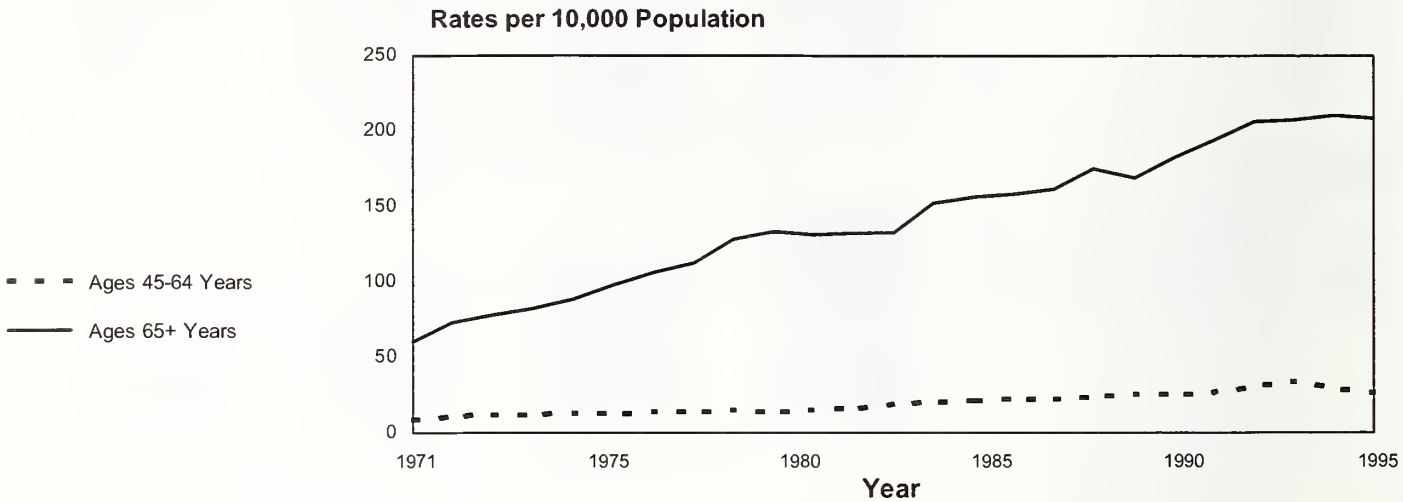
* Systolic blood pressure 160+ mmHg or diastolic blood pressure 95+ or taking antihypertensive medication.

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



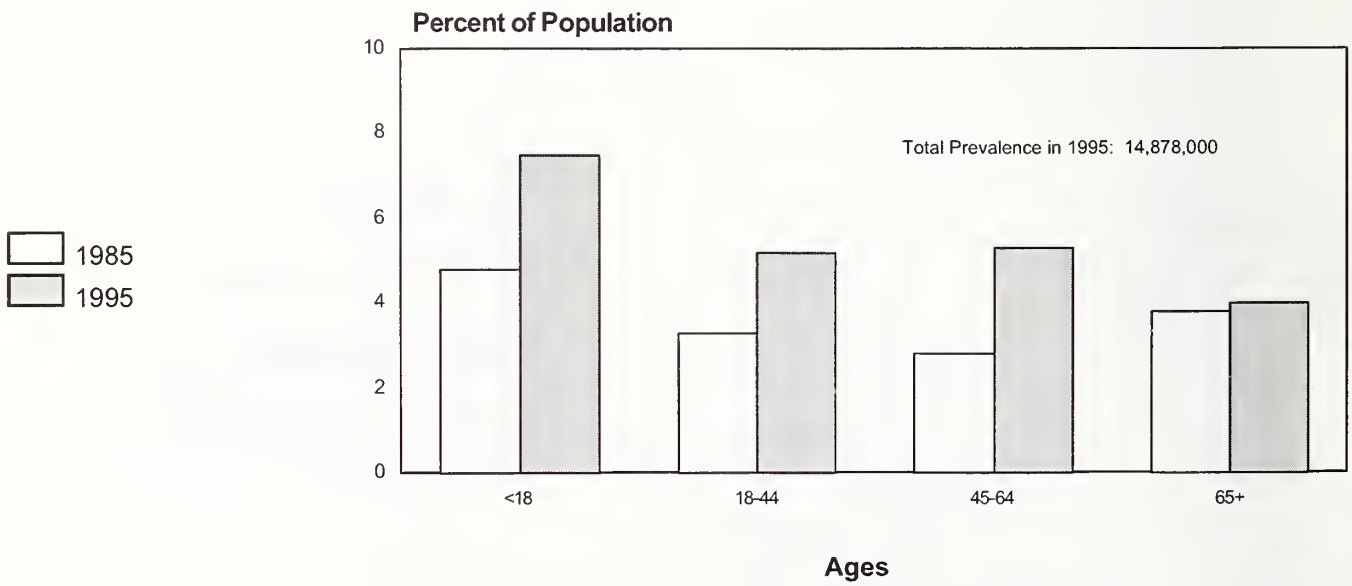
* Systolic blood pressure 140+ or diastolic blood pressure 90+ or taking antihypertensive medication.
Source: NHANES, NCHS, personal communication.

Hospitalization Rates for Congestive Heart Failure, Ages 45-64 Years and 65+ Years, U.S., 1971-95



Source: National Hospital Discharge Survey, NCHS.

Prevalence of Asthma by Age, U.S., 1985 and 1995



Source: NHIS, NCHS.

Direct and Indirect Economic Costs of Illness by Major Diagnosis, U.S., 1998

	Amount (Dollars in Billions)				Percent Distribution			
		Indirect Costs				Indirect Costs		
	Direct Costs*	Morbidity†	Mortality‡	Total	Direct Costs	Morbidity	Mortality	Total
Cardiovascular Disease§	$171.1	$25.2	$77.9	$274.2	14.8	15.7	23.6	16.7
(Including Blood Clotting)**	(40.2)	(5.9)	(21.8)	(67.9)	(3.5)	(3.7)	(6.6)	(4.1)
Lung Diseases††	84.6	20.9	16.4	121.9	7.3	13.0	5.0	7.4
Blood Diseases	8.2	0.6	1.5	10.3	0.7	0.4	0.5	0.6
Subtotal	264.0	46.7	95.8	406.5	22.8	29.1	29.0	24.7
Diseases of the Digestive System	120.7	8.2	13.4	142.3	10.4	5.1	4.1	8.6
Neoplasms	55.4	13.7	73.3	142.4	4.8	8.6	22.2	8.8
Mental Disorders	90.7	21.1	4.3	116.1	7.8	13.2	1.3	7.0
Diseases of the Nervous System	63.1	6.2	5.5	74.8	5.4	3.9	1.7	4.5
Diseases of the Musculoskeletal System	60.7	16.3	1.1	78.1	5.2	10.2	0.3	4.7
Diseases of the Genitourinary System	48.2	4.1	3.0	55.3	4.2	2.6	0.9	3.3
Endocrine, Nutritional, and Metabolic Diseases	42.7	5.2	9.2	57.1	3.7	3.2	2.8	3.4
Infectious and Parasitic Diseases	31.2	9.8	31.6	72.6	2.7	6.1	9.5	4.5
Diseases of the Skin	47.3	1.2	0.2	48.7	4.1	0.8	0.1	2.9
Other Respiratory Diseases	49.1	6.4	2.2	57.7	4.2	4.0	0.6	3.5
Other and Unallocable	285.0	21.4	91.0	397.4	24.6	13.3	27.5	24.1
Total	**$1,159.0**	**$160.5**	**$330.7**	**$1,650.2**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

* Direct costs of CVD are extrapolated to 1998 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 the Health Care Financing Administration (HCFA). Allocation by diagnosis is based on statistics from the National Hospital Discharge Survey, the National Ambulatory Medical Care Survey, National Home and Hospice Survey, and the National Nursing Home Survey of the NCHS.

† Morbidity costs were estimated for 1998 by multiplying 1997 NCHS estimates by a 2.5 percent inflation factor.

‡ Mortality estimates are obtained by multiplying 1997 NCHS estimates by a 2.5 percent inflation factor.

§ Includes congenital cardiovascular disease.

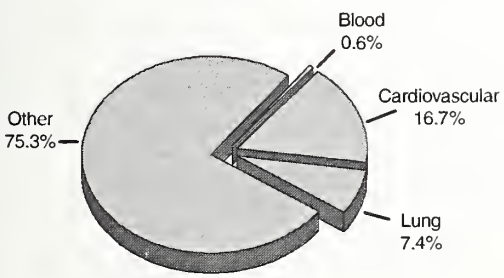
** Based on NHLBI definition of blood-clotting diseases based primarily on proportions of morbidity and mortality statistics for acute myocardial infarction, cerebrovascular diseases, and diseases of arteries.

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

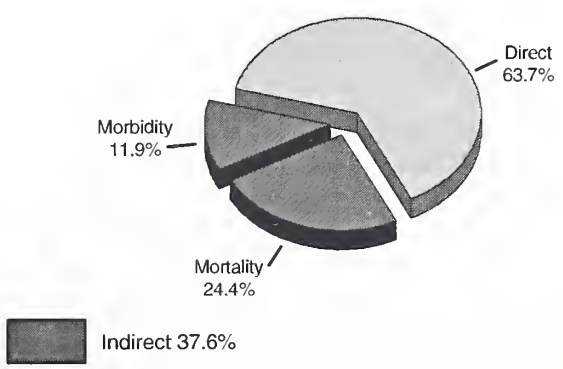
Note: Numbers may not add to total due to rounding.

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

Total Economic Costs, U.S., 1998



Economic Costs: Cardiovascular, Lung, and Blood Diseases, U.S., 1998



5. Institute-Initiated Programs Starting in FY 1997

Approximately three-quarters of the research supported by the National Heart, Lung, and Blood Institute 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 1997.

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 through the setting of priorities among competing programs and establishment of 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 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 or not 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 22 Institute-initiated programs beginning in FY 1997 are presented below according to NHLBI scientific program.

HEART AND VASCULAR DISEASES PROGRAM

Initiatives Being Renewed

National Food and Nutrient Analysis Program

The objective of this Interagency Agreement between the NHLBI and the USDA Nutrient Data Laboratory is to improve the validity and applicability of the nutrient composition data used by human nutrition research, treatment, and education programs in the United States. Nutrients in a probability-based sample of approximately 1,000 key food items that account for over 80 percent of U.S. nutrient intake will be analyzed with up-to-date chemical assays.

National Health and Nutrition Examination Survey IV (NHANES IV)—Cardiovascular Supplement

This Interagency Agreement will provide additional support for a physical examination component to the National Center for Health Statistics NHANES IV. Blood pressure, venipuncture, and

ankle-arm blood pressure index will be measured and laboratory analyses of total cholesterol, HDL-cholesterol, and triglycerides will be performed. Data collected on this representative sample of the U.S. population will provide reliable and objective national indicators of total cardiovascular risk factor and disease prevalence.

New Initiatives

Etiology of Cardiovascular Complications in HIV Infection

The objective of this RFA is to foster fundamental research into the mechanisms responsible for the cardiovascular dysfunction and disease that has been seen in HIV-positive patients. Research findings will contribute to an understanding of the role of virus, viral proteins, immune cells, cytokine production, growth factor expression, and co-infection with other pathogens in the altered function and disease manifestations of the cardiovascular system.

Homocyst(e)inemia and Atherosclerosis

The purpose of this RFA is to identify the mechanisms involved in the etiology of homocyst(e)inemia and those involved in the pathogenesis of atherosclerosis and thrombosis associated with homocyst(e)inemia. A suggested area for investigation includes examination and characterization of vascular lesions in homocyst(e)inemia. The development of molecular assays for detecting heterozygosity of cystathionine beta-synthase, methylenetetrahydrofolate reductase, and methionine synthase deficiencies in homocyst(e)inemic individuals is encouraged.

Specialized Centers of Research (SCORs) in Molecular Medicine and Atherosclerosis

The goal of this RFA is to study the etiology and pathobiology of atherosclerotic lesions at the molecular level and to employ a systematic targeting and design approach to clinical interventions. Investigations will be focused on the pathobiology of atherosclerotic lesions found within the artery wall, including mechanisms for susceptibility and initiation, lesion progression, complication, and regression. Gene transfer and gene therapy, gene mapping and identification, three-dimensional structural biology, vascular imaging, and genetically modified animals will be used.

LUNG DISEASES PROGRAM

Initiative Being Renewed

Tuberculosis Academic Award—FY 97

This RFA was established to develop and improve the quality of medical school curricula, education programs for health care professionals, patients, and the public, and clinical practice for prevention, management, and control of mycobacterial tuberculosis (TB) in the United States.

New Initiatives

Cellular and Molecular Mechanisms of Primary Pulmonary Hypertension (PPH)

The objective of this PA is to stimulate basic research on the etiology and pathogenesis of primary pulmonary hypertension. The application of cellular and molecular approaches to study disease development and subsequent progression is encouraged.

Host Factors Controlling Individual Susceptibility to HIV-Associated Pulmonary Disease

The goal of this RFA is to encourage research on cellular and molecular mechanisms that influence host susceptibility to HIV-associated lung diseases such as tuberculosis, fungal infections, *Pneumocystis carinii* pneumonia, and pulmonary Kaposi's sarcoma. Host factors related to inherited traits, acquired immune responses, and environmental influences are important areas to be explored. In addition, research directed toward understanding normal host defenses may serve as a framework for understanding abnormal defenses.

Linking Environmental Agents, Oxidative Damage, and Disease

The objective of this RFA is to support pilot studies that will develop preliminary data for research projects to examine direct and indirect roles of reactive oxygen species in the etiology, initiation, and exacerbation of non-cancer human diseases, especially pulmonary and cardiovascular diseases. Studies should focus on oxidative stress mechanisms resulting from exposure to injurious agents. The eventual goal is to develop new biomarkers of oxidative damage in humans, including assessment of intra-individual variability, sensitivity, and specificity. Collaborations

between laboratory scientists and epidemiologists are encouraged.

National Emphysema Treatment Trial (NETT)

The purpose of this RFP is to determine the long-term outcome of lung volume reduction surgery (LVRS) on function, mortality, and morbidity, and the appropriate patient selection criteria. The clinical trial will compare the efficacy of LVRS to maximal medical treatment. The primary end point will be functional improvement; secondary end points will be mortality, morbidity improvement in pulmonary function, quality of life, and performance of activities of daily living. A secondary aim of the initiative is to define patient selection criteria. A prospective registry will be established to serve as a repository of severe end-stage emphysematous patients. It will provide the patient base for the trial.

Specialized Centers of Research (SCORs) in Pathobiology of Fibrotic Lung Disease, Pathobiology of Lung Development, and Cellular and Molecular Mechanisms of Asthma

The objective of this RFA is to foster multidisciplinary research enabling basic science findings to be rapidly applied to clinical problems in three areas. The fibrotic lung disease component will expand on current knowledge of molecular events in injury healing and aberrant progressions to fibrotic disease. The lung development component will identify molecular variables involved in lung development and assess the impact of injury during critical periods. The asthma component will increase understanding of cellular and molecular mechanisms of the disease, including those mechanisms underlying the biological impact of environmental factors.

BLOOD DISEASES AND RESOURCES PROGRAM

Initiative Being Renewed

Biological Specimen Repository

The purpose of this RFP is to maintain collections of biological specimens from NHLBI-sponsored studies and, under direction of the Institute, make appropriate specimens available to the scientific community for use in research related to transfusion-transmitted diseases and a variety of other disorders of the blood and the cardiovascular and respiratory systems. Examples of research protocols include: evaluation of more sensitive tests for HIV, evaluation of newly identified agents, study of hemostatic changes during and immediately after myocardial infarction, evaluation of hemostatic differences between patients whose vessels remain patent after thrombolytic therapy and those who suffer reclosure, and etiology of thrombotic thrombocytopenia purpura.

New Initiatives

Homing Determinants in Hematopoietic Stem and Progenitor Cells

The purpose of this RFA is to delineate the function and regulation of homing determinants and their receptors (or ligands) that are involved in regulation of growth and differentiation of hematopoietic stem and progenitor cells. The initiative will identify the cascade of interactive events in early phases of hematopoietic cell differentiation and its relation to engraftment. The ultimate goal is to identify the potentials of this cascade for exploitation in various clinical states, particularly in bone marrow transplantation.

Human Anti-HIV Monoclonal Antibodies in Immunotherapy of HIV

The objectives of this RFA are to support research aimed at generating broadly neutralizing human anti-HIV monoclonal antibodies (mAb), develop animal model systems to evaluate their effectiveness as passive immunotherapy for prevention and treatment of HIV infection, and establish an efficient in vitro neutralization test (or other assay systems) for validation of the animal studies. The goal of this program is to produce sufficient effective mAb (or mixtures of mAbs) perhaps in combination with other products and make them available to examine efficacy in clinical trials.

Research on the Hematologic Abnormalities in AIDS

The purpose of this PA is to study the cellular basis of hematologic abnormalities that are common in AIDS patients and that have a significant impact on their course of treatment. Examples of target conditions include bone marrow dysplasia, anemia, thrombocytopenia, and leukopenia.

INSTITUTE-WIDE INITIATIVES

Initiative Being Renewed

Small Business Innovation Research Contract Program—FY 1997

This RFP will provide contract support, through the PHS Small Business Innovation Research Program, to small business concerns for research and development of new or improved technologies and methodologies that have potential to succeed as commercial products. In FY 1997, the NHLBI encouraged proposals in the following three product areas: stage- and tissue-specific animal models of hemophilia, radio-frequency coils for high field magnetic resonance imaging (MRI), and ECG monitoring in MRI to detect cardiac ischemia.

New Initiatives

Development of New Gene Therapy Vectors and Delivery Systems

The goal of this PA is to encourage collaborations between small business concerns and research institutions, including colleges and universities, in the design and development of gene therapy vectors and delivery systems for use in treating cardiovascular, pulmonary, and hematologic diseases.

Gene Transfer Principles for Heart, Lung, and Blood Diseases

The objectives of this RFA are to encourage study of gene transfer in cardiovascular, pulmonary, and hematologic diseases; provide the infrastructure required to establish collaboration of experts in the diverse research areas required to undertake this intensive, multidisciplinary enterprise; and attract established and new investigators to gene therapy for heart, lung, blood, and blood vessel diseases by providing access to critical technologies through shared facilities and funds. The major goal of this program is to foster research that will provide the basic science foundation necessary for gene transfer technology and its application to somatic gene transfer.

Mitochondrial DNA Mutations in Heart, Lung, and Blood Diseases

This RFA was established to foster research on molecular, cellular, genetic, and epidemiologic approaches to elucidate the role of mitochondrial DNA (mtDNA) mutations in heart, blood vessels, blood, and lung diseases. The goals are to define mechanisms by which mtDNA mutations cause tissue-specific, progressive diseases, and to elucidate the cause-and-effect relationships between alterations in this genome and pathological phenotypes. The ultimate objective of this initiative is to develop effective strategies for prevention and treatment of cardiovascular, pulmonary, and hematologic disorders due to mitochondrial DNA mutations in humans.

Molecular Biology and Genetics of Sleep and Sleep Disorders

The objective of this RFA is to advance understanding of the molecular and genetic basis of sleep and sleep disorders. Specifically, the program is designed to stimulate studies on basic molecular correlates of sleep, cellular mechanisms responsible for restorative processes during sleep, interactions between sleep and circadian systems controlling sleep and wakefulness at a molecular level, genetic basis of sleep disorders, and molecular neurobiology of sleep and sleep disorders.

NIH-WIDE INITIATIVES

New Initiatives

Chronic Fatigue Syndrome Pathophysiology

The purpose of this PA is to encourage research in the pathogenesis of chronic fatigue syndrome (CFS) with the goal of developing diagnostic and intervention strategies.

Rat Gene Catalogue and Expressed Sequence Tag (EST) Map

This RFA will add an EST component to the NIH-wide Rat Genome Project. The 2-year effort will involve arraying 100,000 complementary DNA (cDNA) clones that are currently being produced, generating ESTs from each clone, and mapping the unique ESTs generated using the radiation hybrid (RH) panel currently being produced. Given the redundancy expected, approximately 25,000 unique sequences should be obtained. The project should significantly expand the opportunities offered by the Rat Genome Project and increase the value of the cDNA and RH resources that are already being generated.

6. Institute Public Advisory Committees

National Heart, Lung, and Blood Advisory Council

Structure

Chair: Claude Lenfant, M.D., Director, National Heart, Lung, and Blood Institute

Executive Secretary: Ronald G. Geller, Ph.D., Director, Division of Extramural Affairs, National Heart, Lung, and Blood Institute

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 Affair
- 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

Ernest Beutler, M.D. (1997)
The Scripps Research Institute

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

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

James D. Crapo, M.D. (1997)
Duke University Medical Center

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

Willa A. Hsueh, M.D. (1997)
University of Southern California

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

Karen A. Matthews, Ph.D. (1997)
University of Pittsburgh

Carmen Ramos-Bonoan, M.D. (1999)
Child Health Clinics of New York City
Health and Hospitals Corporation

John D. Rudd, M.D. (1998)
Murfreesboro, 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

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 1997. 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: Cage S. Johnson, M.D., University of Southern California

Executive Secretary: Clarice D. Reid, M.D., Director, Division of Blood Diseases and Resources, NHLBI, National Institutes of Health, Bethesda, Maryland 20892, (301) 435-0080

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)
Southwood Medical Office of Kaiser Permanente

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

Joseph Desimone, Ph.D. (2000)
University of Illinois College of Medicine

James R. Eckman, M.D. (1998)
Emory University School of Medicine

Mary Ellen Fabry, Ph.D. (1998)
Albert Einstein College of Medicine

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

William C. Mentzer, Jr., M.D. (1998)
San Francisco General Hospital

June Vavasseur, M.P.H. (1997)
Program Consultant
Pomona, California

Ex Officio Members

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

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

David A. Satcher, M.D.
Centers for Disease Control and Prevention

Ciro V. Sumaya, M.D.
Health Resources and Services Administration

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

Sleep Disorders Research Advisory Board

Chair: Thomas Roth, Ph.D., Henry Ford 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*

Sudhansu Chokroverty, M.D. (1998)
St. Vincent's Hospital and Medical Center

* Current as of October 1997.

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

Victoria P. Haulcy, M.P.H. (1999)
Institute for Healthcare Quality

Carla G. Kidd (1998)
Consultant
Greenwich, CT

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

Patricia N. Prinz, Ph.D. (2000)
University of Washington

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

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

Carol U. Walker (2000)
Restless Legs Syndrome Foundation

David P. White, M.D. (2001)
Brigham and Women's Hospital

Ex Officio Members

Duane F. Alexander, M.D.
NICHD, National Institutes of Health

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

Zach W. Hall, Ph.D.
NINDS, National Institutes of Health

Richard J. Hodes, M.D.
NIA, National Institutes of Health

Steven E. Hyman, M.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

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

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

Clinical Trials Review Committee

Chair: Gervasio A. Lamas, M.D.
Mount Sinai Medical Center

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*

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

Clarence E. Davis, Ph.D. (1998)
University of North Carolina

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

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

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

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

Pamela Ouyang, M.D. (1998)
Johns Hopkins Bayview Medical Center

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

* Current as of October 1997.

Paula K. Roberson, Ph.D. (1998)
University of Arkansas for Medical Sciences

Elliott P. Vichinsky, M.D. (1998)
Children's Hospital Medical Center of Northern California

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.

Membership*

Carol B. Basbaum, Ph.D. (1999)
University of California, San Francisco

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

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

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)
Durham Veteran's Administration Medical Center

John R. Hoidal, M.D. (1998)
University of Utah

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

Peter J. Newman, Ph.D. (1998)
The Blood Center of Southeastern Wisconsin

Peter J. Quesenberry, M.D. (1998)
University of Massachusetts Medical Center

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

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

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.

* Current as of October 1997.

Board of Scientific Counselors (continued)

Membership*

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

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

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

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

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

* Current as of October 1997.

7. Fiscal Year 1997 Budget Overview

NHLBI Obligations by Budget Mechanism: Fiscal Year 1997

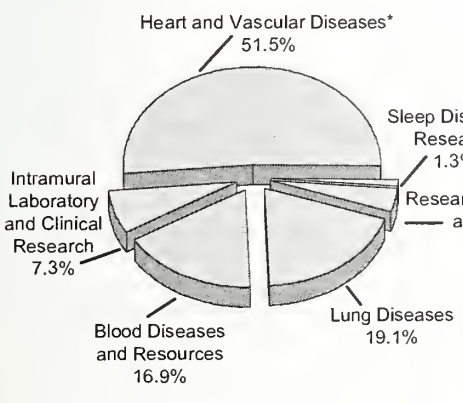
Budget Mechanism	Obligated Dollars FY 1997* (Dollars in Thousands)	Percent of Total NHLBI FY 1997 Budget
Research Project Grants†	$935,322	65.3%
Specialized Centers of Research (SCORS)	87,742	6.1
Sickle Cell Centers	20,923	1.5
Other Research Grants	56,993	4.0
Research Careers Programs	(33,911)	(2.4)
Training Programs	49,836	3.5
Research and Development Contracts	121,937	8.5
Intramural Laboratory and Clinical Research	104,441	7.3
Research Management and Support‡	54,627	3.8
Research Facilities Construction Grants	0	0.0
Total, NHLBI	**$1,431,821**	**100.0%**

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

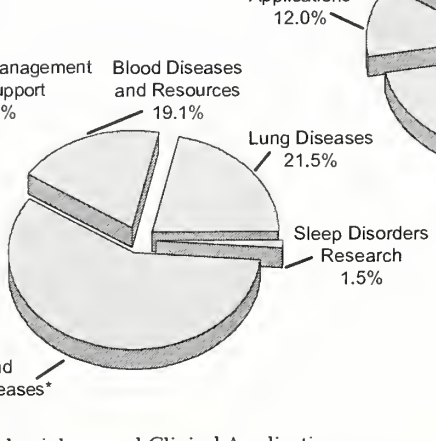
† Includes $32,831 for Small Business Innovation Research (SBIR) Grants.

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

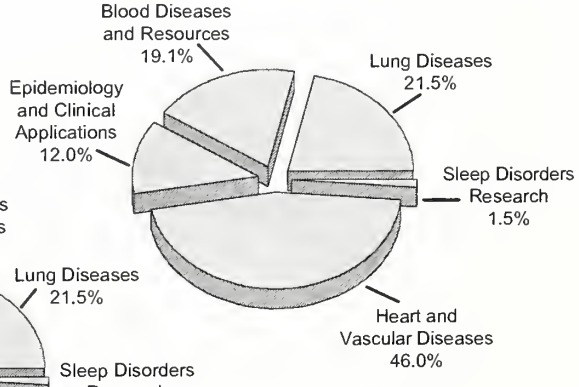
NHLBI Total Obligations by Budget Category



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 1997

- 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 1997

Program	Obligated Dollars FY 1997 (Dollars in Thousands)	Percent of NHLBI Extramural FY 1997 Budget
Heart and Vascular Diseases*	$737,925	58.0%
Lung Diseases	273,438	21.5
Blood Diseases and Resources	242,668	19.1
Sleep Disorders Research	18,722	1.5
Total, Extramural Obligations	**$1,272,753**	**100.0%**

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

NHLBI Heart and Vascular Diseases Program Obligations by Budget Mechanism: Fiscal Year 1997

Budget Mechanism	Obligated Dollars (Dollars in Thousands)	Percent of Program Budget
Research Project Grants	$557,830	75.6%
Specialized Centers of Research (SCORS)	40,923	5.5
Other Research Grants	24,470	3.3
Research Career Programs	(14,992)	(2.0)
Training Programs	29,883	4.0
Research and Development Contracts	84,819	11.5
Total, Heart and Vascular Diseases	**$737,925**	**100.0%**

NHLBI Epidemiology and Clinical Applications Obligations by Budget Mechanism: Fiscal Year 1997

Budget Mechanism	Obligated Dollars (Dollars in Thousands)	Percent of Epidemiology and Clinical Applications Budget
Research Project Grants	$94,763	62.0%
Specialized Centers of Research (SCORS)	0	0.0
Other Research Grants	835	0.5
Research Career Programs	(775)	(0.5)
Training Programs	3,292	2.2
Research and Development Contracts	53,929	35.3
Total, Epidemiology and Clinical Applications	**$152,820**	**100.0%**

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

NHLBI Lung Diseases Program
Obligations by Budget Mechanism: Fiscal Year 1997

Budget Mechanism	Obligated Dollars (Dollars in Thousands)	Percent of Program Budget
Research Project Grants	$189,457	69.3%
Specialized Centers of Research (SCORS)	32,470	11.9
Other Research Grants	21,348	7.8
Research Career Programs	(11,696)	(4.3)
Training Programs	11,980	4.4
Research and Development Contracts	18,183	6.6
Total, Lung Diseases	**$273,438**	**100.0%**

NHLBI Blood Diseases and Resources Program
Obligations by Budget Mechanism: Fiscal Year 1997

Budget Mechanism	Obligated Dollars (Dollars in Thousands)	Percent of Program Budget
Research Project Grants	$173,687	71.6%
Specialized Centers of Research (SCORS)	11,524	4.7
Sickle Cell Centers	20,923	8.6
Other Research Grants	9,974	4.1
Research Career Programs	(6,022)	(2.5)
Training Programs	7,625	3.1
Research and Development Contracts	18,934	7.8
Total, Blood Diseases and Resources	**$242,668**	**100.0%**

NHLBI National Center on Sleep Disorders Research
Obligations by Budget Mechanism: Fiscal Year 1997

Budget Mechanism	Obligated Dollars (Dollars in Thousands)	Percent of Program Budget
Research Project Grants	$14,348	76.6%
Specialized Centers of Research (SCORS)	2,825	15.1
Other Research Grants	1,201	6.4
Research Career Programs	(1,201)	(6.4)
Training Programs	348	1.9
Research and Development Contracts	0	0.0
Total, Center on Sleep Disorders Research	**$18,722**	**100.0%**

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

8. Long-Term Trends

Budget History of the NHLBI: Fiscal Years 1950-97

(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

[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.

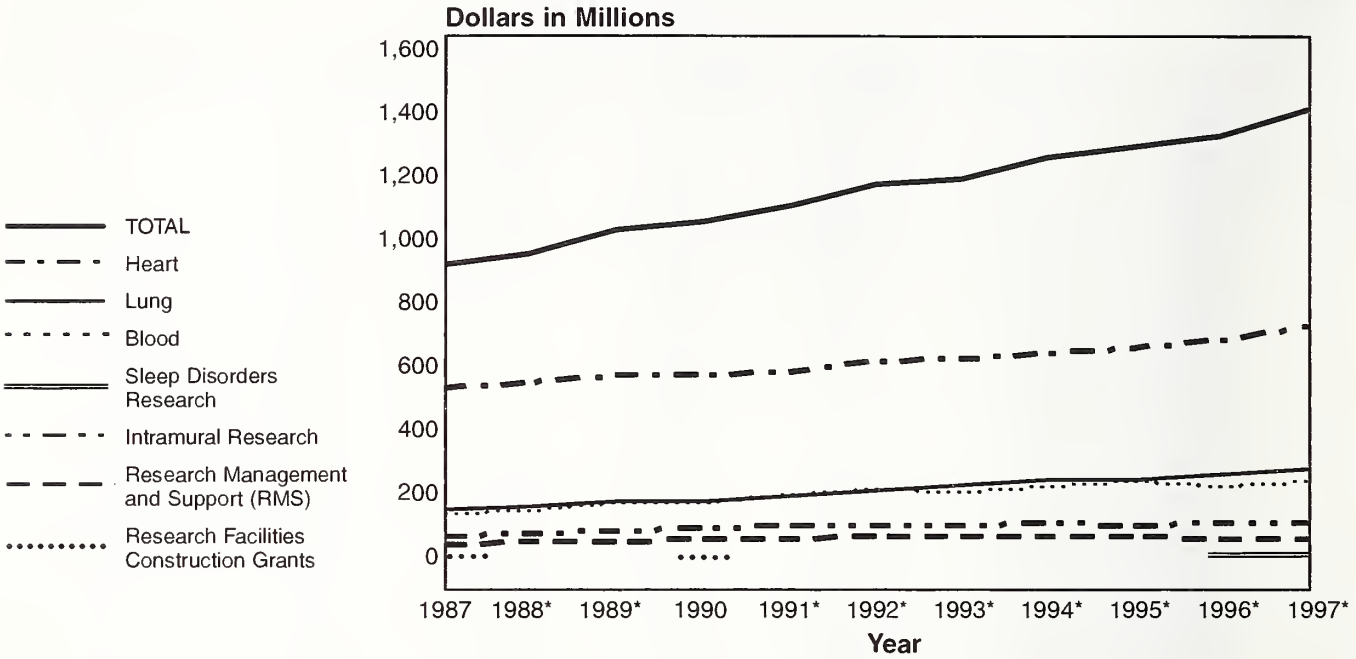
[3] Obligations reflect the Institute share of the government-wide rescission, the HHS rescission, and a transfer to other NIH Institutes through the NIH Director's one percent transfer authority.

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

[5] Excludes enacted administrative reduction.

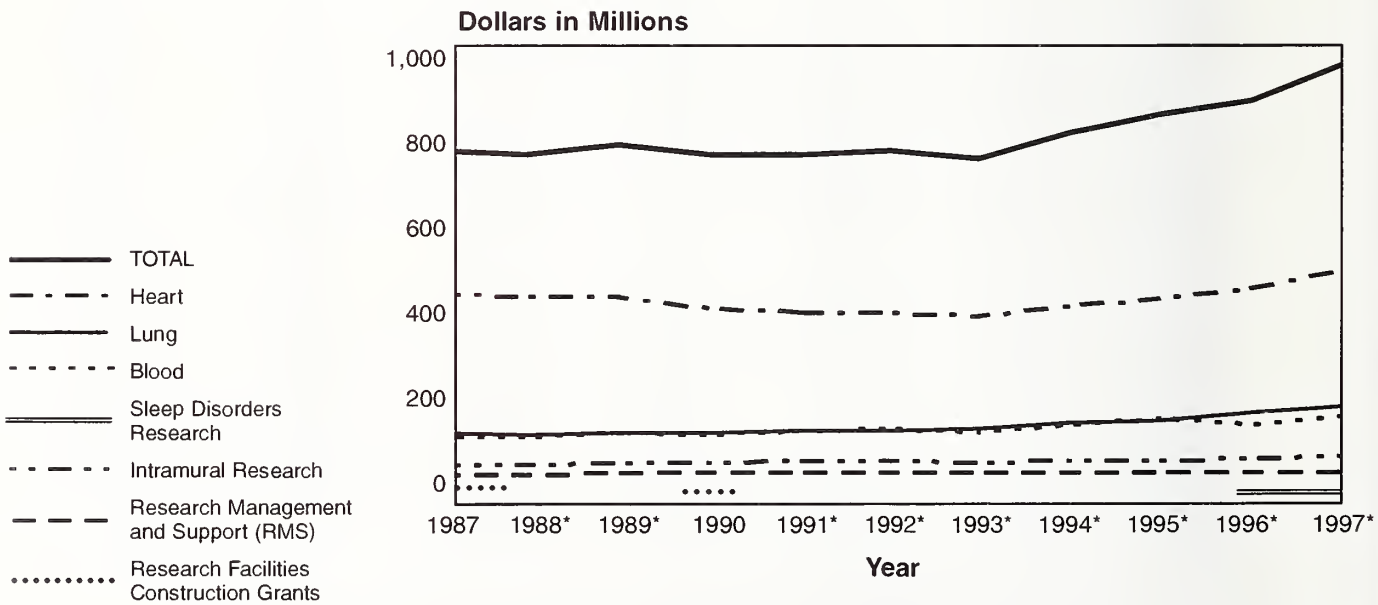
NHLBI Total Obligations by Budget Category: Fiscal Years 1987-97

Current Dollars



NHLBI Total Obligations by Budget Category: Fiscal Years 1987-97

Constant 1987 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 1987-97

Current Dollars (Millions)

	Fiscal Year										
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Heart	$533.1	$552.2	$581.7	$579.6	$589.6	$619.5	$632.0	$651.7	$668.9	$692.8	$737.9
Lung	151.2	154.3	171.4	177.0	193.8	203.4	221.6	238.7	243.0	261.9	273.4
Blood	140.9	148.7	169.3	175.2	195.9	211.9	203.5	227.4	244.6	224.3	242.7
Sleep Disorders Research	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.9	18.7
Intramural Research	63.6	68.0	77.0	85.5	93.7	97.1	98.2	101.7	98.9	101.8	104.4
Research Management and Support (RMS)	38.9	42.1	46.1	52.7	52.9	58.2	59.4	58.4	59.5	54.8	54.6
Research Facilities Construction Grants	2.3	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	**$930.0**	**$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**

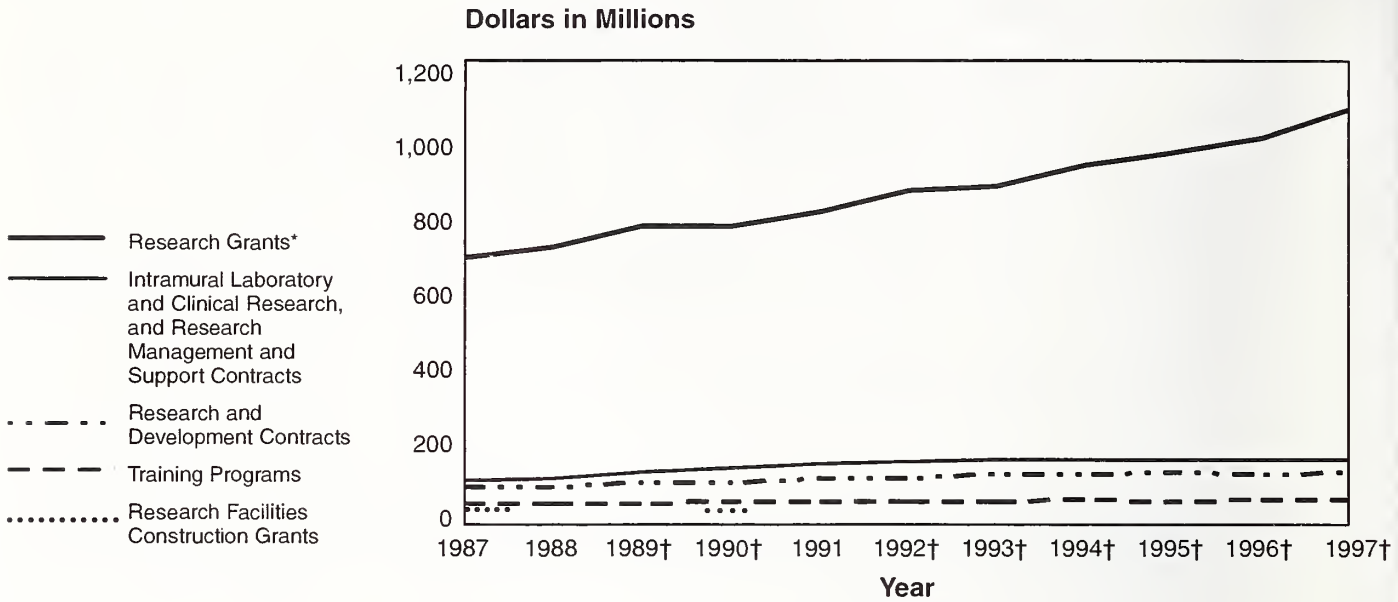
Note: Numbers may not add to total due to rounding.

Constant 1987 Dollars (Millions)

	Fiscal Year										
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Heart	$533.1	$525.9	$526.6	$497.3	$482.8	$485.9	$479.4	$475.8	$471.8	$476.3	$492.5
Lung	151.2	147.0	155.2	151.9	158.7	159.5	168.1	174.3	171.4	180.1	182.5
Blood	140.9	141.6	153.3	150.3	160.4	166.2	154.4	166.0	172.5	154.2	162.0
Sleep Disorders Research	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.9	12.5
Intramural Research	63.6	64.8	69.7	73.4	76.7	76.2	74.5	74.2	69.8	70.0	69.7
Research Management and Support (RMS)	38.9	40.1	41.7	45.2	43.3	45.6	45.1	42.6	42.0	37.7	36.5
Research Facilities Construction Grants	2.3	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	**$930.0**	**$919.3**	**$946.5**	**$918.7**	**$921.9**	**$933.4**	**$921.3**	**$932.9**	**$927.5**	**$929.1**	**$955.7**

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 1987-97



NHLBI Total Obligations by Budget Mechanism: Fiscal Years 1987-97

(Dollars in Millions)

Budget Mechanism	Fiscal Year 1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Research Grants*	$703.7	$731.8	$785.7	$788.9	$824.9	$880.4	$895.3	$951.2	$982.6	$1,025.4	$1,100.9
Research and Development (R&D) Contracts	82.3	83.9	96.7	98.4	108.7	107.7	117.5	118.3	125.9	120.9	121.9
Training Programs	39.2	39.5	39.9	44.4	45.8	46.7	44.3	48.3	48.0	48.5	49.8
Intramural Laboratory and Clinical Research (DIR), and Research Management and Support (RMS)	102.5†	110.1†	123.2†	138.3†	146.5	155.3	157.6	160.1	158.4	156.6	159.1
Research Facilities Construction Grants	2.3	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total, NHLBI	**$930.0**	**$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**

* Includes Research Career Programs.

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

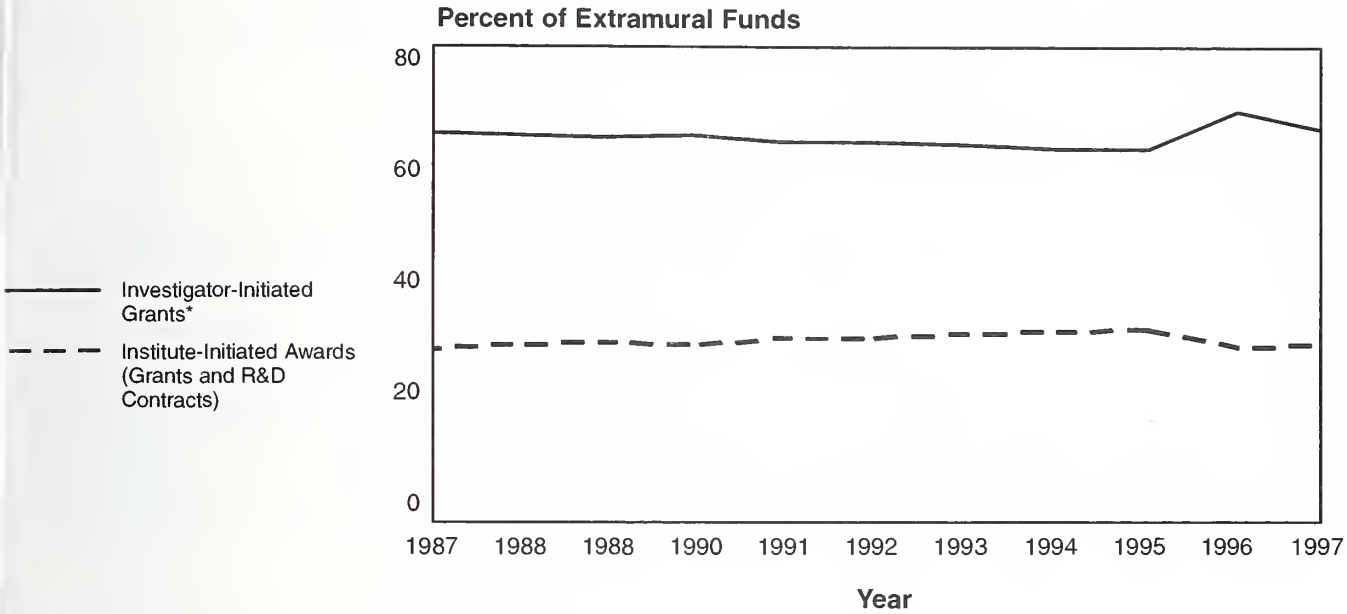
NHLBI Employment: Fiscal Years 1987-97

Staff	Fiscal Year 1987*	1988*	1989*	1990*	1991	1992	1993	1994	1995	1996	1997
FTEs†	833	865	842	845	891	931	911	854	822	834	829

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

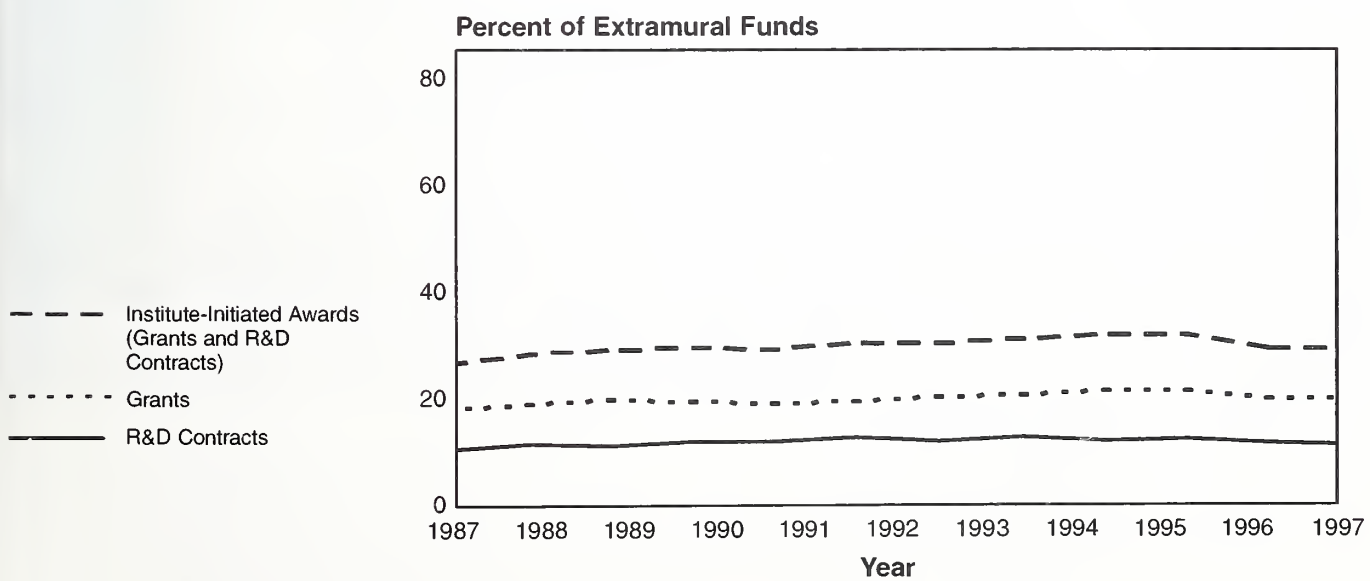
† Full-time equivalents.

NHLBI Institute-Initiated and Investigator-Initiated Awards: Fiscal Years 1987-97



* Includes Research Career Programs.

NHLBI Grants and Research and Development Contracts as Subsets of Institute-Initiated Awards: Fiscal Years 1987-97



NHLBI Extramural Programs: Fiscal Years 1987-97

Dollars

(Dollars in Millions)

Budget Mechanism	Fiscal Year 1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Investigator-Initiated Awards											
Investigator-Initiated Grants*	$532.7	$548.7	$592.5	$598.1	$616.3	$654.8	$663.2	$669.7	$725.0	$815.5	$835.3
Research Career Programs K04, K06	20.6	21.0	20.3	21.5	22.8	23.0	23.1	25.1	25.7	28.9	28.9
Subtotal	553.3	569.7	612.8	619.6	639.1	677.8	686.3	724.8	750.7	844.4	864.2
Institute-Initiated Awards											
Grants (RFAs)	150.4	162.1	173.0	169.4	185.8	202.6	209.0	226.4	231.9	216.8	236.8
(Centers)	(87.4)	(88.9)	(87.9)	(88.4)	(92.2)	(96.5)	(96.6)	(101.5)	(107)	(87.5)	(87.7)
R&D Contracts (RFPs)	82.3	83.9	96.7	98.4	108.7	107.7	117.5	118.3	125.9	116.7	121.9
Subtotal	232.7	246.0	269.7	267.8	294.5	310.3	326.5	344.7	357.8	333.5	358.7
Training	39.2	39.5	39.9	44.4	45.8	46.7	44.3	48.2	48.0	48.5	49.8
Total, Extramural	**$825.2**	**$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**

NHLBI Extramural Programs: Fiscal Years 1987-97

Percent

(As Percent of Total Extramural Funds)

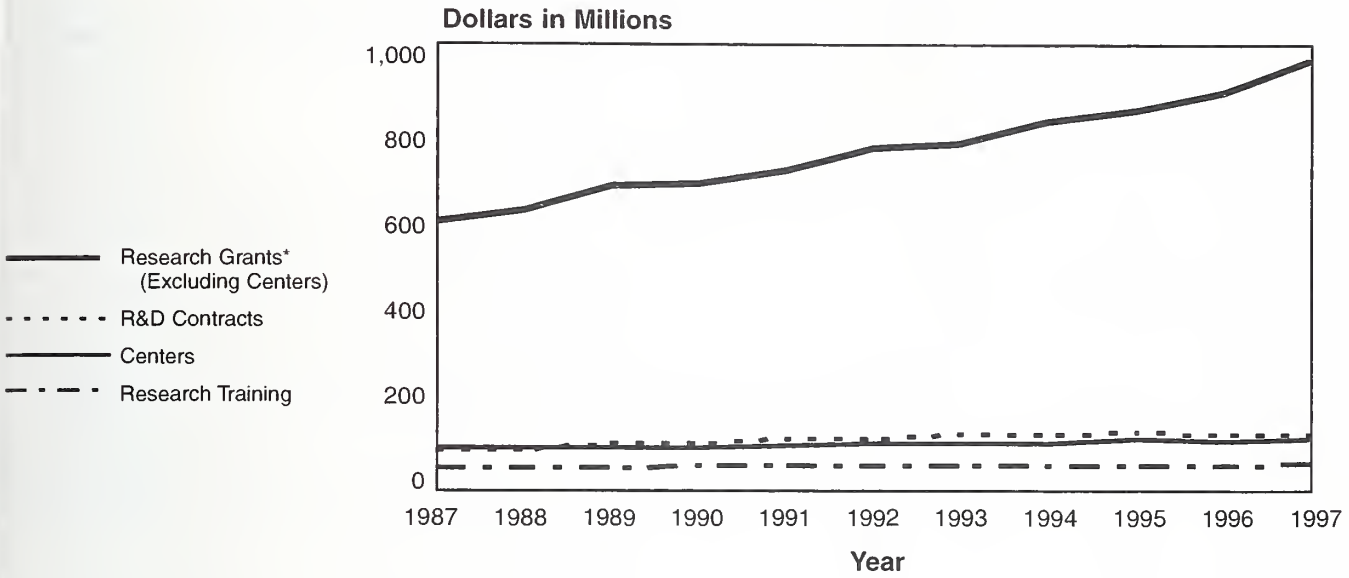
Budget Mechanism	Fiscal Year 1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Investigator-Initiated Awards											
Investigator-Initiated Grants*	64.5	64.2	64.2	64.0	62.9	63.2	62.7	62.6	62.7	69.2	65.6
Research Career Programs K04, K06	2.5	2.4	2.3	2.6	2.3	2.3	2.2	2.3	2.2	2.5	2.3
Subtotal	67.1	66.6	66.5	66.6	65.2	65.5	64.9	64.9	64.9	71.7	67.9
Institute-Initiated Awards											
Grants (RFAs)	18.2	19.0	18.7	18.1	19.0	19.6	19.8	20.2	20.1	18.4	18.6
(Centers)	(10.6)	(10.4)	(9.5)	(9.5)	(9.4)	(9.3)	(9.1)	(9.1)	(9.2)	(7.4)	(6.9)
R&D Contracts (RFPs)	10.0	9.8	10.5	10.6	11.1	10.4	11.1	10.6	10.9	9.9	9.6
Subtotal	28.2	28.8	29.2	28.6	30.1	30.0	30.9	30.8	31.0	28.3	28.2
Training	4.8	4.6	4.3	4.8	4.7	4.5	4.2	4.3	4.1	4.1	3.9
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 1987-97

Dollars



NHLBI Extramural Research Funding Mechanism: Fiscal Years 1987-97

Dollars

(Dollars in Millions)

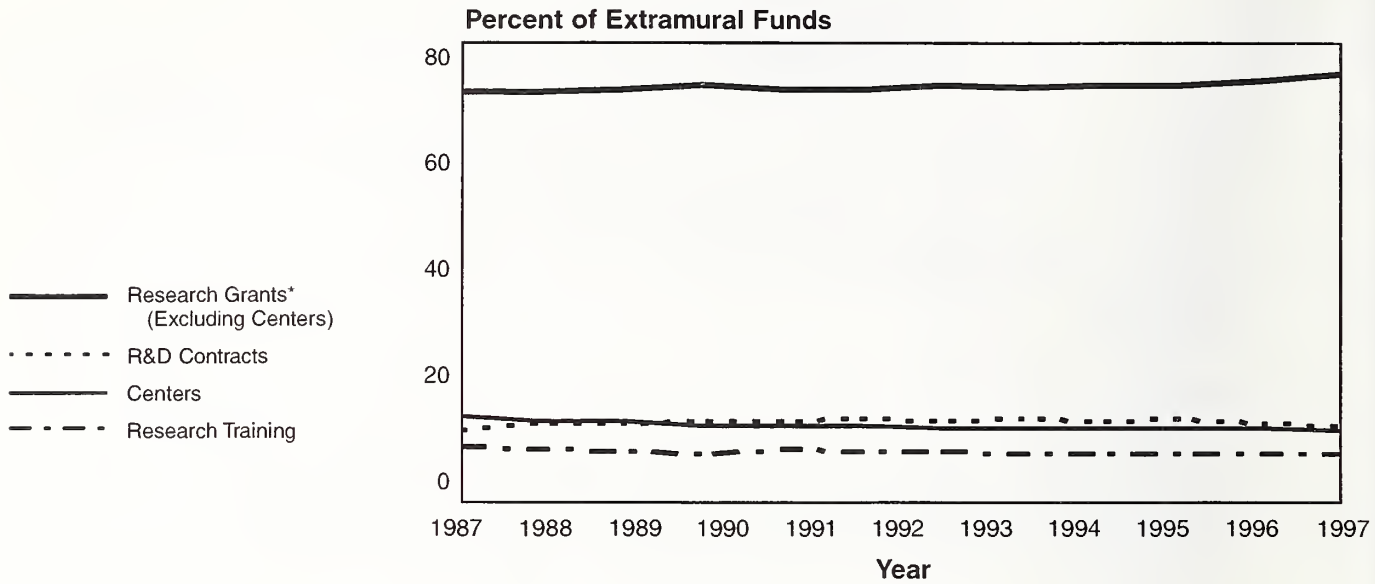
Budget Mechanism	Fiscal Year 1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Research Grants* (Excluding Centers)	$616.3	$642.9	$697.9	$700.6	$732.7	$783.9	$798.7	$849.7	$875.7	$918.7	$992.3
Centers	87.4	88.9	87.9	88.4	92.2	96.5	96.6	101.5	107.0	106.7	108.7
R&D Contracts	82.3	83.9	96.7	98.4	108.7	107.7	117.5	118.3	125.9	120.9	121.9
Research Training	39.2	39.5	39.9	44.4	45.8	46.7	44.3	48.3	48.0	48.5	49.8
Total, Extramural	**$825.2**	**$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**

* Includes Research Career Programs.

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

NHLBI Extramural Research Funding Mechanism: Fiscal Years 1987-97

Percent



NHLBI Extramural Research Funding Mechanism: Fiscal Years 1987-97

Percent

	(Percent)										
	Fiscal Year										
Budget Mechanism	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**
Research Grants* (Excluding Centers)	74.7	75.2	75.7	75.2	74.8	75.8	75.6	76.0	75.7	76.9	78.0
Centers	10.6	10.4	9.5	9.5	9.4	9.3	9.1	9.1	9.2	8.9	8.5
R&D Contracts	10.0	9.8	10.5	10.6	11.1	10.4	11.1	10.6	10.9	10.1	9.6
Research Training	4.8	4.6	4.3	4.8	4.7	4.5	4.2	4.3	4.2	4.1	3.9
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

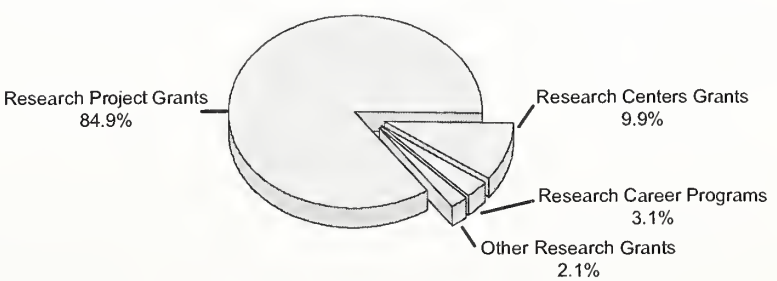
NHLBI Research Grants by Activity: Fiscal Year 1997

	Number of Grants Obligated	Total Cost (Dollars in Thousands)	Percent of Total NHLBI Research Grant Dollars
Research Project Grants (RPGs)*			
Regular Research Grants (R01)	2,178	$576,569	53.37%
Small Research Grants (R03)	15	1,091	0.10
Program Project Grants (P01)	149	207,420	18.84
Cooperative Agreements (U01)	104	50,808	4.61
Area Grants (R15)	—	24	0.00
Exploratory Developmental Grant (R21)	5	562	0.05
Transition Award (R29)	313	32,828	2.98
Method to Extend Research in Time (R37)	108	33,189	3.01
Subtotal	2,872	902,491	81.97
Small Business Technology Transfer (STTR Phase I) (R41)	6	597	0.05
Small Business Technology Transfer (STTR Phase II) (R42)	5	1,270	0.12
Small Business Innovation Research (SBIR Phase I) (R43)	81	7,895	0.72
Small Business Innovation Research (SBIR Phase II) (R44)	66	23,069	2.10
Subtotal, Small Business	158	32,831	2.98
Subtotal, Research Project Grants	3,030	935,322	84.95
Research Centers Grants			
Specialized Centers of Research (SCOR) (P50)	67	87,742	7.97
Sickle Cell Centers (P60)	10	20,923	1.90
Subtotal, Research Centers Grants	77	108,665	9.87
Research Career Programs			
Mentored Research Development Award for Minority Faculty (K01)	5	460	0.04
Minority Institutional Faculty Mentored Research Scientist Award (K01)	1	106	0.01
Research Scientist Development Award (K02)	8	545	0.05
Research Career Development Award (K04)	18	1,227	0.11
Research Career Award (K06)	3	103	0.01
Systemic Pulmonary and Vascular Diseases Academic Award (K07)	9	1,415	0.13
Asthma Academic Award (K07)	9	764	0.07
Tuberculosis Academic Award (K07)	23	1,831	0.17
Sleep Academic Award (K07)	12	1,027	0.09
Clinical Investigator Scientist Award (K08)	267	22,237	2.02
Minority School Faculty Development Award (K14)	9	729	0.07
Research Development Award for Minority Faculty (K14)	34	3,468	0.31
Subtotal, Research Career Programs	398	33,912	3.08
Other Research Grants			
Cooperative Clinical Research (U10, R10)	39	16,994	1.54
Minority Biomedical Research Support (S06, S14)	—	2,722	0.25
Other (R09, R13, R25, T15, U09, U24)	22	3,365	0.31
Subtotal, Other Research Grants	61	23,081	2.10
Total, NHLBI Research Grants	**3,566**	**$1,100,980**	**100.00%**

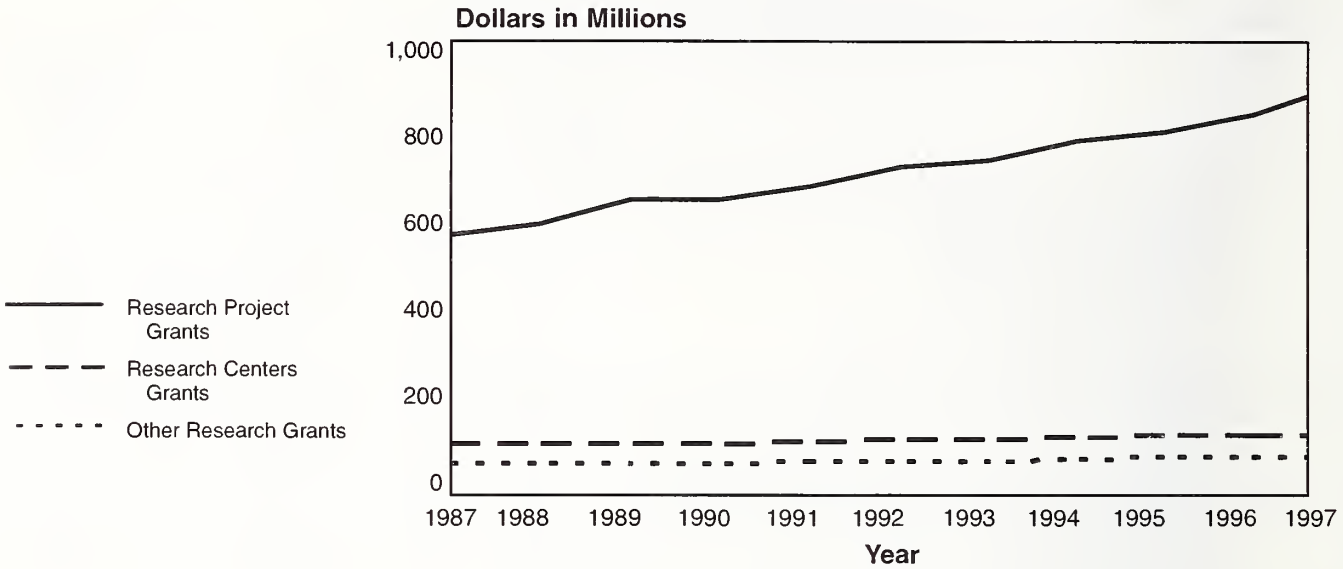
For descriptions of grants, see pages 141-44.

*Excludes program evaluation assessment of $4.4 million ($4,435,000).

NHLBI Total Research Grants by Category



NHLBI Research Project Grant,* Research Centers Grant, and Other Research Grant Obligations: Fiscal Years 1987-97



NHLBI Research Project Grant,* Research Centers Grant, and Other Research Grant Obligations: Fiscal Years 1987-97

(Dollars in Thousands)

	Fiscal Year										
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Research Project Grants	$576,340	$603,861	$658,388	$660,722	$688,330	$736,232	$752,978	$797,092‡	$819,674‡	$862,027‡§	$935,322‡
Research Centers Grants	87,424	88,947	87,870	88,382	92,174	96,510	96,628	101,535	106,980	106,688	108,665
Other Research Grants†	39,946	38,999	39,524	39,841	44,387	47,656	45,654	52,576	55,974	56,692	56,993
Total	**$703,710**	**$731,807**	**$785,782**	**$788,945**	**$824,891**	**$880,398**	**$895,260**	**$951,203**	**$982,628**	**$1,025,407**	**$1,100,980**

* Includes P01s.

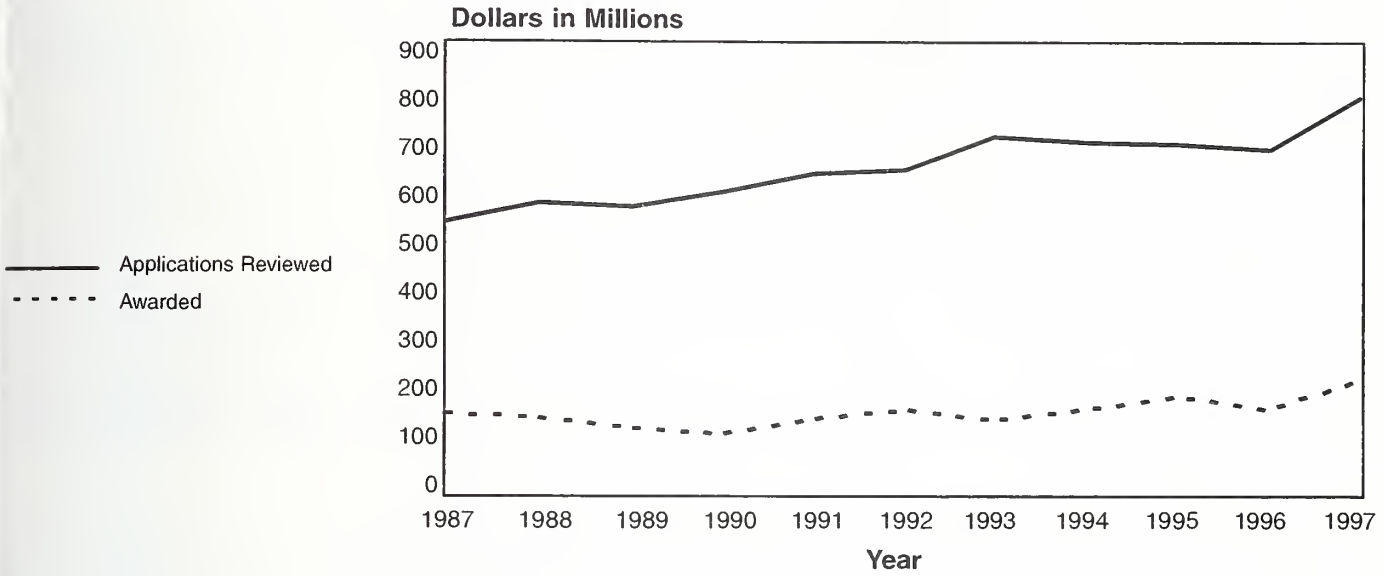
† Includes Research Career Programs; excludes General Research Support Grants.

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

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

NHLBI Competing Research Project Grant Applications*: Fiscal Years 1987-97

Total Cost Dollars Reviewed and Awarded



NHLBI Competing Research Project Grant Applications*: Fiscal Years 1987-97

Total Cost Dollars Reviewed and Awarded

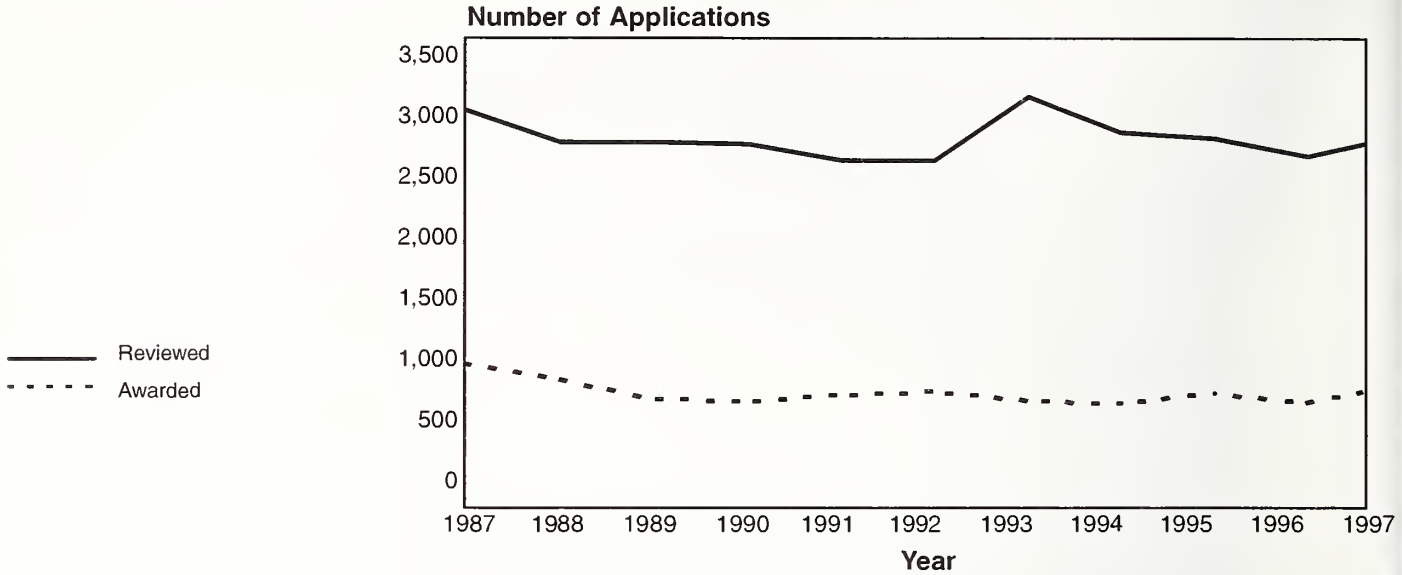
(Dollars in Millions)

	Fiscal Year										
	1987	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**
Applications Reviewed	$555.5	$590.9	$585.8	$614.9	$650.8	$658.4	$724.3	$715.0	$710.3	$699.2	$802.1
Awarded	172.4	168.2	143.1	134.8	162.8	181.3	158.0	180.4	207.5	182.1	240.1

* 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 1987-97

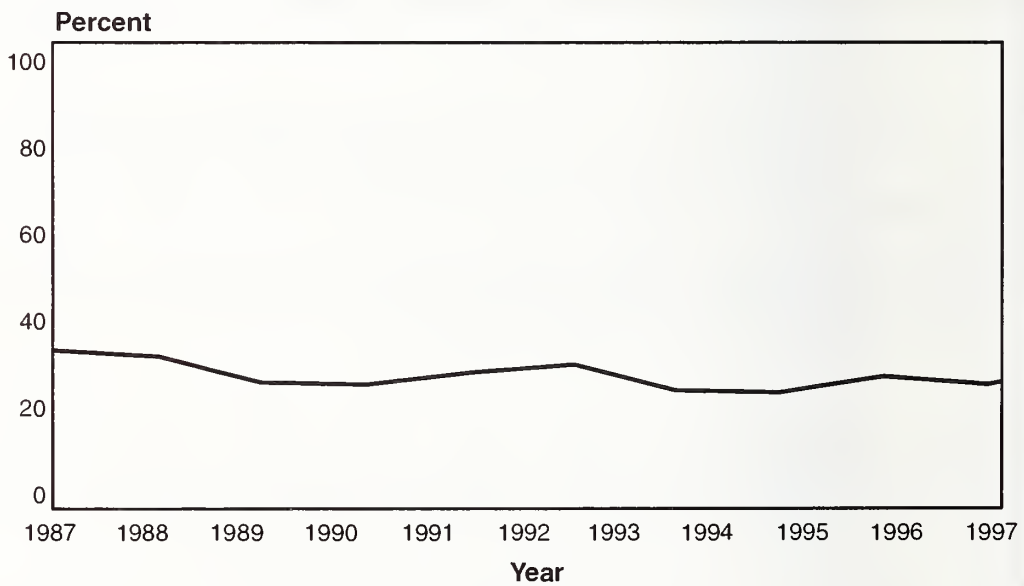
Number Reviewed and Awarded



(Number of Applications)

	Fiscal Year										
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Applications Reviewed	2,964	2,714	2,716	2,707	2,571	2,580	3,072	2,801	2,744	2,605	2,771
Awarded	966	851	698	675	717	759	673	655	740	652	821

Percent of Reviewed Applications Funded (Success Rate)

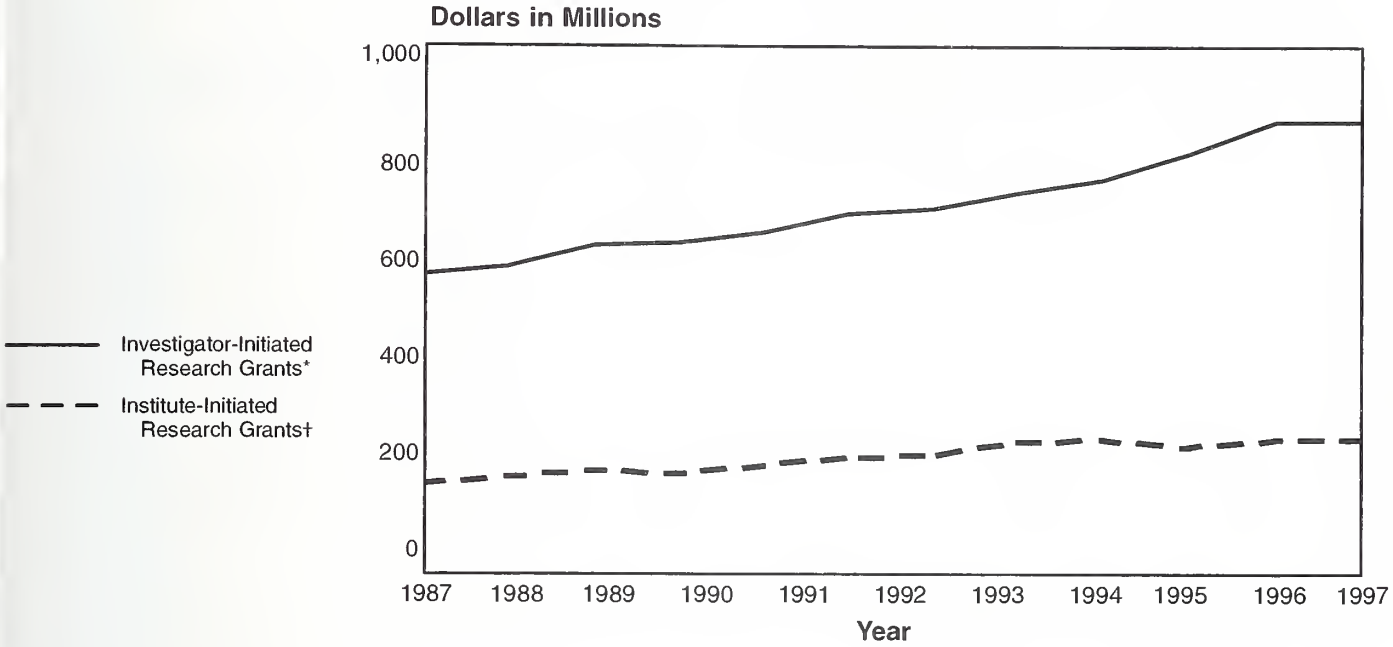


(Percent)

	Fiscal Year										
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Success Rates	33.1	33.2	25.9	24.4	26.6	28.8	21.1	23.4	27.0	25.0	29.6

* 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 1987-97



NHLBI Investigator-Initiated and Institute-Initiated Research Grant Obligations: Fiscal Years 1987-97

(Dollars in Millions)

	Fiscal Year										
	1987	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**
Investigator-Initiated*	$558.8	$574.6	$618.1	$625.0	$645.8	$683.9	$692.8	$724.8	$750.7	$804.1	$867.9
Institute-Initiated†	144.9	157.2	167.7	164.0	179.1	196.5	202.5	226.4	231.9	216.8	233.0
Total	**$703.7**	**$731.8**	**$785.8**	**$789.0**	**$824.9**	**$880.4**	**$895.3**	**$951.2**	**$982.6**	**$1,020.9‡**	**$1,100.9**

* 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 1987-97

(Dollars in Millions)

Fiscal Year	Competing				Noncompeting	Total Noncompeting and Competing
	New Competing	Renewal Competing	Competing Supplements	Total		
1987	83.5	90.8	4.1	178.4	397.9	576.3
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

Facility and Administrative (F&A)† Rates of NHLBI Research Project Grants*: Fiscal Years 1987-97

(Dollars in Thousands)

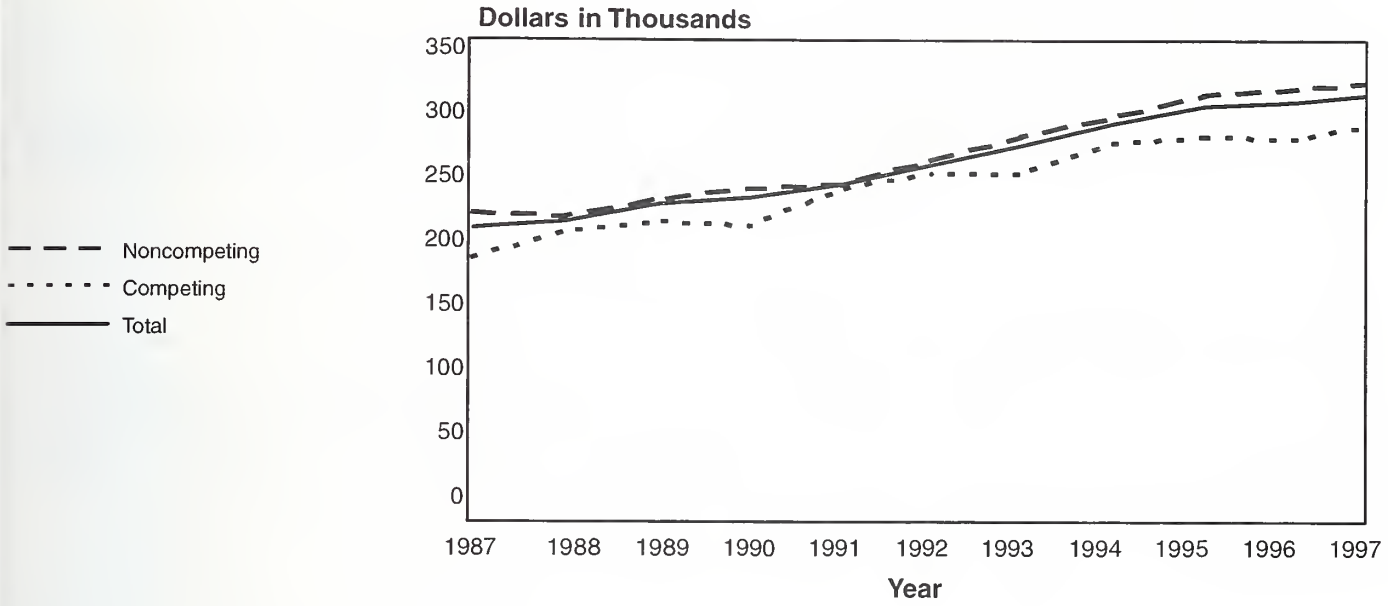
Fiscal Year	Direct Cost	F&A Cost‡	F&A Cost as a Percent of Direct Cost	Total Cost
1987	394,555	181,784	46.1	576,340
1988	415,471	188,390	45.3	603,861
1989	452,557	205,831	45.5	658,388
1990	450,497	210,225	46.7	660,722
1991	470,623	217,707	46.3	688,330
1992	503,076	233,156	46.3	736,232
1993	516,022	236,956	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

* 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 1987-97



NHLBI Research Project Grants*: Average Cost, Fiscal Years 1987-97

(Dollars in Thousands)

	Fiscal Year										
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Noncompeting	$221.1	$217.2	$231.5	$239.9	$243.2	$261.7	$281.0	$294.8	$312.8	$317.5	323.0
Competing	184.7	206.4	214.5	211.1	239.3	251.4	252.0	275.5	280.4	279.3	292.5
Total	**$208.4**	**$214.0**	**$227.4**	**$233.1**	**$242.2**	**$259.0**	**$273.9**	**$290.1**	**$303.7**	**$308.3**	**$314.2**

* 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 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 1997*	FY 1997	Total to Date*
Heart and Vascular Diseases Program				
Arteriosclerosis	1971-	$328,075	$401	$328,476
Gene Transfer Principles for Heart, Lung, and Blood Diseases	1997-	–	5,165	5,165
Ischemic Heart Disease in Blacks	1995-	4,474	2,541	7,015
Ischemic Heart Disease, Sudden Cardiac Death, Heart Failure	1995-	25,740	14,013	39,753
Molecular Genetics of Hypertension	1996-	8,065	8,734	16,799
Molecular Medicine and Atherosclerosis	1997-	–	6,363	6,363
Pediatric Cardiovascular Disease	1993-	8,879	3,706	12,585
Subtotal, Heart and Vascular Diseases Program		375,233	40,923	416,156
Lung Diseases Program				
Acute Lung Injury	1994-	19,852	7,422	27,274
Cellular and Molecular Mechanisms of Asthma	1996-	3,831	9,940	13,771
Cystic Fibrosis	1988-	21,662	3,478	25,140
Pathobiology of Fibrotic Lung Disease	1997-	–	4,504	4,504
Pathobiology of Lung Development	1996-	1,430	7,125	8,555
Subtotal, Lung Diseases Program		46,775	32,469	79,244
Blood Diseases and Resources Program				
Hematopoietic Stem Cell Biology	1995-	7,780	3,420	11,200
Thrombosis	1971-	123,329	4,136	127,465
Transfusion Medicine	1985-	31,757	3,969	35,726
Subtotal, Blood Diseases and Resources Program		162,866	11,525	174,391
National Center for Sleep Disorders Research				
Cardiopulmonary Disorders During Sleep	1988-	18,488	2,825	21,313
Subtotal, National Center for Sleep Disorders Research		**18,488**	**2,825**	**21,313**
Total, Specialized Centers of Research (P50)		**$603,362**	**$87,742**	**$691,104**

* Excludes Transition Quarter, 1976.

Specialized Centers of Research (P50) Program

Heart and Vascular Diseases Program

Gene Transfer Principles for Heart, Lung, and Blood Diseases

In four SCORs, research is conducted to provide the basic science foundation necessary for gene transfer technology and its application to somatic gene transfer.

Obligations

Fiscal Year 1997—$5,164,409

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

In two SCORs, investigators are fostering an interdisciplinary study of issues surrounding the expression of heart disease in blacks.

Obligations

Fiscal Year 1997—$2,541,305

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

In 10 SCORs, investigators are studying 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 1997—$14,013,058

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

Obligations

Fiscal Year 1997—$8,734,292

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

In five SCORs, research is conducted to advance understanding of the etiology and pathobiology of the atherosclerotic lesion at the molecular level through the modern methods and approaches of molecular medicine.

Obligations

Fiscal Year 1997—$6,362,434

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

Investigators will apply innovative approaches to elucidate the etiology and pathophysiology of pediatric cardiovascular diseases (CVD) and will translate their findings to improve diagnosis, treatment, and prevention of CVD in children.

Obligations

Fiscal Year 1997—$3,705,883

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

In six SCORs, researchers are conducting studies on biochemical, immunologic, and physiologic mechanisms of acute lung injury and repair to improve the diagnosis, management, and prevention of adult respiratory distress syndrome.

Obligations

Fiscal Year 1997—$7,422,340

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

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 1997—$9,940,255

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

Cystic Fibrosis

Research in four SCORs emphasizes the exploration of basic mechanisms underlying cystic fibrosis, the elaboration of new hypotheses, and the generation of innovative strategies for approaching clinical and fundamental issues.

Obligations

Fiscal Year 1997—$3,478,096

Current Active Organizations and Grant Numbers

1. University of California, San Francisco, San Francisco, California —HL-42368
2. University of North Carolina, Chapel Hill, North Carolina —HL-42384
3. University of Iowa, Iowa City, Iowa —HL-42385
4. Case Western Reserve University, Cleveland, Ohio —HL-50160

Pathobiology of Fibrotic Lung Disease

In three SCORs, to focus on cellular and molecular mechanisms involved in the transition from the inflammatory events associated with early fibrotic disease to the later processes involving wound healing, repair, and fibrosis.

Obligations

Fiscal Year 1997—$4,504,309

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 1997—$7,125,045

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

In three SCORs, researchers will advance our 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 1997—$3,420,000

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

In three SCORs involved with blood diseases, scientists are emphasizing research defining the pathogenic mechanisms of human thrombotic disease and methods for its diagnosis and treatment.

Obligations

Fiscal Year 1997—$4,135,756

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

Three Transfusion Medicine SCORs have 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 1997—$3,968,566

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

Cardiopulmonary Disorders During Sleep

In three SCORs, basic and clinical research focuses on the pathogenesis, diagnosis, and management of cardiopulmonary disorders during sleep.

Obligations

Fiscal Year 1997—$2,825,154

Current Active Organizations and Grant Numbers

1. Case Western Reserve University, Cleveland, Ohio —HL-42215
2. University of Pennsylvania, Philadelphia, Pennsylvania —HL-42236
3. University of Wisconsin, Madison, Wisconsin —HL-42242

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 application, training, and community service projects into one program.

Obligations

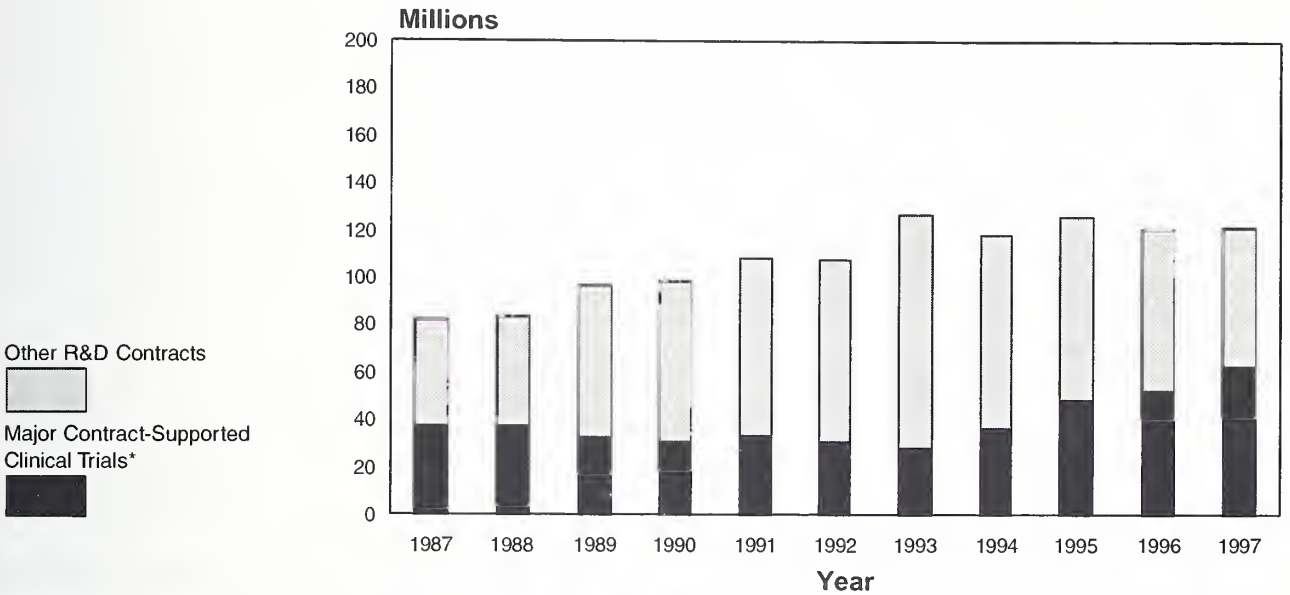
Fiscal Year 1997—$20,922,613

Current Active Organizations and Grant Numbers

1. Boston City Hospital, Boston, Massachusetts —HL-15157
2. University of California, San Francisco, San Francisco, California —HL-20985
3. College of Physicians and Surgeons of Columbia University, New York, New York —HL-28381
4. Duke University, Durham, North Carolina —HL-28391
5. Children's Hospital of Philadelphia, Philadelphia, Pennsylvania —HL-38632
6. University of South Alabama, Mobile, Alabama —HL-38639
7. Montefiore Medical Center, New York, New York —HL-38655
8. Meharry Medical College, Nashville, Tennessee —HL-38737
9. Emory University, Atlanta, Georgia —HL-48482
10. University of Southern California, Los Angeles, California —HL-48484

10. Research and Development Contracts

NHLBI Research and Development Contract Obligations*: Fiscal Years 1987-97



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

NHLBI Total Research and Development Contract Obligations: Fiscal Years 1987-97

(Dollars in Thousands)

	Fiscal Year										
	1987	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**
Heart	$53,389	$61,342	$63,944	$62,177	$61,070	$57,714	$66,717	$67,173	$70,178	$80,373	$84,820
Lung	12,183	6,122	9,169	10,338	16,910	16,977	18,552	21,957	15,414	21,032	18,183
Blood	16,693	16,408	23,607	25,862	30,725	32,980	32,280	29,122	40,324	19,522	18,934
Total	**$82,265**	**$83,872**	**$96,720**	**$98,377**	**$108,705**	**$107,671**	**$117,549**	**$118,252**	**$125,916**	**$120,927***	**$121,937†**

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

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

Major NHLBI Research and Development Contracts by Program*: Fiscal Year 1997

	Total Obligations Prior to FY 1997	Total FY 1997 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Atherosclerosis Risk in Communities (ARIC)	$87,045,485	$9,546,000	$96,591,485
Cardiovascular Health Study (CHS)	50,626,436	7,072,758	57,699,194
Circulatory Assist/Artificial Heart Program	83,377,292	24,000	83,401,292
Framingham Study	22,410,997	0	22,410,997
Honolulu Heart Program (HHP)	11,710,254	252,000	11,962,254
Innovative Ventricular Assist System (IVAS)	13,909,000	7,607,059	21,516,059
Mammalian Genotyping Service Center	2,990,769	2,216,981	5,207,750
Lung Diseases			
A Case-Controlled Etiologic Study of Sarcoidosis (ACCESS)	4,000,013	2,262,271	6,262,284
Interventions to Improve Asthma Management and Prevention at School	2,947,325	1,233,000	4,180,325
Pediatric Lung and Heart Complications of HIV Infection	37,068,620	667,750	37,736,370
Blood Diseases and Resources			
Refinement of New Assays for Direct Detection of Viral Nucleic Acids in Donated Organs	5,102,000	3,505,313	8,607,313
Retrovirus Epidemiology Donor Study (REDS)	38,852,178	2,460,883	41,313,061

* Excludes clinical trials included in Chapter 11. Selected programs are described on the pages that follow.

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 1997—$9,546,000
Fiscal Years 1985-96—$87,045,485
Total Funding to Date—$96,591,485

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 1997—$7,072,758
Fiscal Years 1988-96—$50,626,436
Total Funding to Date—$57,699,194

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 1997—$24,000
Fiscal Years 1984-96—$83,377,292
Total Funding to Date—$83,401,292

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

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 1997—$0
Fiscal Years 1983-96—$22,410,977
Total Funding to Date—$22,410,977

Current Active Organization and Contract Number

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

Honolulu Heart Program

The National Institute on Aging, in collaboration with the NHLBI, completed a fifth examination of the surviving cohort in April 1996, collecting blood pressures and resting ECGs as well as measures of cognitive function and the recording of morbidity, mortality, and the incidence of senile dementia.

Obligations

Funding History:
Fiscal Year 1997—$252,000
Fiscal Years 1980-96—$11,710,254
Total Funding to Date—$11,962,254

Current Active Organization and Contract Number

1. Kuakini Medical Center, Honolulu, Hawaii —HC-05102

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 lifetime with 90 percent reliability.

Obligations

Funding History:
Fiscal Year 1997—$7,607,059
Fiscal Year 1995-96—$13,909,000
Total Funding to Date—$21,516,059

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. Transicoil, Inc., Trooper, Pennsylvania —HV-58157
5. Whalen Biomedical, Inc., Cambridge, Massachusetts —HV-58158
6. Cleveland Clinic Foundation, Cleveland, Ohio —HV-58159

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.

Obligations

Funding History:
Fiscal Year 1997—$2,216,981
Fiscal Year 1994-96—$2,990,769
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 1997—$2,262,271
Fiscal Years 1995-96—$4,000,013
Total Funding to Date—$6,262,284

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 1997—$1,233,000
Fiscal Year 1995-96—$2,947,325
Total Funding to Date—$4,180,325

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 Lung and Heart Complications of HIV Infection, Initiated in Fiscal Year 1989

This 6-year, 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 1997—$667,750
Fiscal Years 1989-96—$37,068,620
Total Funding to Date—$37,736,370

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. Mt. Sinai School of Medicine, New York, New York —HR-96042
5. Presbyterian Hospital in the City of New York, New York, New York —HR-96043

Blood Diseases and Resources Program

Refinement of New Assays for Direct Detection of Viral Nucleic Acids in Donated Organs, 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 and organs for transplantation. The purpose of these new techniques is to reduce the antibody-negative window between infectivity and detection to the shortest possible time and, when possible, to obviate the need for an indirect antibody test.

Obligations

Funding History:
Fiscal Year 1997—$3,505,313
Fiscal Year 1996—$5,102,000
Total Funding to Date—$8,607,313

Current Active Organizations and Contract Numbers

1. Gen-Probe, Inc., San Diego, California —HB-67130
2. Johnson & Johnson Clinical Diagnostics, Inc., Rochester, New York —HB-67131

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

This program was established to accurately 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 1997—$2,460,883
Fiscal Years 1989-96—$38,852,178
Total Funding to Date—$41,313,061

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

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: Ending After FY 1991

Research Grants and Cooperative Agreements (Dollars in Thousands)

	Fiscal Year										
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Heart and Vascular Diseases											
Program on Surgical Control of Hyperlipidemias (POSCH)	$3,405	$3,175	$2,394	$1,902	$1,584	$0	$485	$500	$538	$566	$294
Stanford Coronary Risk Intervention Program (SCRIP)	1,102	1,405	1,485	1,410	354	382	—	—	—	—	—
Electrophysiologic Study vs. Electrocardiographic Monitoring (ESVEM)	1,795	—	959	794	904	740	—	—	—	—	—
Coronary Artery Surgery Study Follow-up	663	532	—	—	644	670	—	—	—	—	—
Emory Angioplasty Versus Surgery Trial (EAST)	942	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	—	—	—	—	—
Infant Heart Surgery: Central Nervous System Sequelae of Circulatory Arrest	—	—	588	623	720	770	756	516	598	699	685
Lifestyle Heart Trial	—	—	515	530	604	524	—	—	—	—	—
Thrombolysis in Myocardial Ischemia (T3)	—	—	4,029	1,957	4,011	636	—	—	—	—	—
Do Fish Oils Prevent Restenosis Post-Coronary 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 *	—	—	—	—	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
Diet and Exercise for Elevated Risk (DEER)	—	—	—	—	717	775	805	703	—	—	—
Clinical Trial--Cardiovascular Risk Factors and the Menopause	—	—	—	—	—	539	610	601	451	478	493
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	—	—

NHLBI Investigator-Initiated Clinical Trials: Ending After FY 1991 (continued)

Research Grants and Cooperative Agreements (Dollars in Thousands)

	Fiscal Year										
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Heart and Vascular Diseases (continued)											
CABG Patch Trial *	—	—	—	—	—	—	3,362	3,117	1,344	988	1,171
Women's Antioxidant and Cardiovascular Study (WACS)	—	—	—	—	—	—	586	612	620	643	500
Oral Calcium in Pregnant Women with Hypertension	—	—	—	—	—	—	280	290	306	320	332
Stress Reduction and Hypertensive Heart Disease in Blacks	—	—	—	—	—	—	—	219	330	403	407
Enalapril After Anthracycline Cardiotoxicity	—	—	—	—	—	—	—	587	647	707	724
Stress and Anger Management for Blacks with Hypertension	—	—	—	—	—	—	—	221	232	241	250
Estrogen Replacement and Atherosclerosis (ERA) Trial*	—	—	—	—	—	—	—	1,123	260	1,213	965
Early Revascularization for Cardiogenic Shock	—	—	—	—	—	—	—	1,070	1,022	1,008	826
Does Atherosclerosis Regress with Therapy for Low HDLC?	—	—	—	—	—	—	—	484	480	427	445
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
Mode Selection Trial in Sinus Node Dysfunction (MOST)*	—	—	—	—	—	—	—	—	2,163	1,857	2,096
Antioxidants and Prevention of Early Atherosclerosis*	—	—	—	—	—	—	—	—	793	240	603
Postmenopausal Hormone Therapy in Unstable Angina	—	—	—	—	—	—	—	—	253	258	264
Postmenopausal Hormone Replacement Therapy After CABG*	—	—	—	—	—	—	—	—	—	476	244
Soy Estrogen Alternative Study (SEA)	—	—	—	—	—	—	—	—	—	219	217
REMATCH Trial*	—	—	—	—	—	—	—	—	—	—	1,258
Dietary Patterns, Sodium Intake, and Blood Pressure (DASH 2)*	—	—	—	—	—	—	—	—	—	—	2,233
Sudden Cardiac Death in Heart Failure Trial (SCD-HeFT)*	—	—	—	—	—	—	—	—	—	—	1,571
CVD Risk and Health in Post-Menopausal Phytoestrogen Users	—	—	—	—	—	—	—	—	—	—	630
Subtotal, Heart and Vascular Diseases	7,907	7,829	13,639	11,728	19,325	12,780	13,309	16,098	15,921	13,603	18,881

* Indicates paid by U01.

NHLBI Investigator-Initiated Clinical Trials: Ending After FY 1991 (continued)

Research Grants and Cooperative Agreements (Dollars in Thousands)

	Fiscal Year										
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Lung Diseases											
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
Subtotal, Lung Diseases	—	—	—	1,014	949	1,022	2,309	4,835	5,172	3,734	3,944
Blood Diseases and Resources											
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	2,583
Pediatric Hydroxyurea in Sickle Cell Anemia (PED HUG)	—	—	—	—	—	—	—	146	250	260	270
Subtotal, Blood Diseases and Resources	—	—	202	203	2,210	3,359	3,439	8,678	5,991	2,958	2,853
Total, NHLBI	**$7,907**	**$7,829**	**$13,841**	**$12,945**	**$22,484**	**$17,161**	**$19,057**	**$29,611**	**$27,084**	**$20,295**	**$25,678**

* Indicates paid by U01.

** Previously an Institute-Initiated Clinical Trial.

NHLBI Investigator-Initiated Clinical Trials, Fiscal Year 1997: Summary by Program

	Total Obligations Prior to FY 1997	Total FY 1997 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Antioxidants and Prevention of Early Atherosclerosis *	$1,032,953	$602,845	$1,635,798
CABG Patch Trial *	8,811,229	1,170,784	9,982,013
Cardiovascular Risk Factors and the Menopause	2,678,519	493,491	3,172,010
CVD Risk and Health in Postmenopausal Phytoestrogen Users	0	630,472	630,472
Dietary Patterns, Sodium Intake, and Blood Pressure (DASH 2) *	0	2,233,363	2,233,363
Does Atherosclerosis Regress with Therapy for Low HDLC?	1,391,151	444,748	1,835,899
Early Revascularization for Cardiogenic Shock	3,099,506	825,514	3,925,020
Emory Angioplasty Surgery Trial (EAST)	8,911,600	0	8,911,600
Enalapril After Anthracycline Cardiotoxicity	1,941,070	724,443	2,665,513
Estrogen Replacement and Atherosclerosis (ERA) Trial *	2,596,645	965,209	3,561,854
Infant Heart Surgery: Central Nervous System Sequelae of Circulatory Arrest	5,269,024	685,393	5,954,417
Mode Selection Trial in Sinus Node Dysfunction (MOST) *	4,019,295	2,096,369	6,115,664
Multicenter Unsustained Tachycardia Trial (MUSTT) *	10,750,665	0	10,750,665
Oral Calcium in Pregnant Women with Hypertension	1,195,354	332,427	1,527,781
Postmenopausal Hormone Replacement Therapy After CABG *	475,913	244,429	720,342
Postmenopausal Hormone Therapy in Unstable Angina	510,480	264,184	774,664
Program on Surgical Control of Hyperlipidemia (POSCH)	52,545,804	293,931	52,839,735
REMATCH Trial *	0	1,257,604	1,257,604
Soy Estrogen Alternative Study (SEA)	219,254	217,000	436,254
Stress and Anger Management for Blacks with Hypertension	693,777	250,440	944,217
Stress Reduction and Hypertensive Heart Disease in Blacks	951,865	407,319	1,359,184
Sudden Cardiac Death in Heart Failure Trial (SCD-HeFT) *	0	1,570,932	1,570,932
Trial of Vitamin E and Aspirin in Women	9,901,445	1,473,001	11,374,446
Women's Antioxidant and Cardiovascular Study (WACS)	2,460,906	500,486	2,961,392
Women's Estrogen/Progestin Lipid-Lowering Hormone Atherosclerosis Regression Trial (WELL-HART) *	1,306,158	1,196,378	2,502,536
Subtotal, Heart and Vascular Diseases	$120,762,613	$18,880,762	$139,643,375
Lung Diseases			
Inhaled Beclomethasone to Prevent Chronic Lung Disease*	2,561,990	435,688	2,997,678
Lung Health Study II †	11,519,375	3,508,340	15,027,715
Subtotal, Lung Diseases	$14,081,365	$3,944,028	$18,025,393
Blood Diseases and Resources			
Pediatric Hydroxyurea in Sickle Cell Anemia (PED HUG)	656,000	270,000	926,000
Stroke Prevention in Sickle Cell Anemia (STOP) *	8,442,414	2,583,432	11,025,846
Trial to Reduce Alloimmunization to Platelets (TRAP), Extension †	4,019,174	0	4,019,174
Subtotal, Blood Diseases and Resources	$13,117,588	$2,853,432	$15,971,020
Total, NHLBI	**$147,961,566**	**$25,678,222**	**$173,639,788**

* Indicates paid by U01.

† Previously an Institute-Initiated Clinical Trial.

Institute-Initiated Clinical Trials: Ending After FY 1991

Contracts

(Dollars in Thousands)

	Fiscal Year										
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Heart and Vascular Diseases											
Lipid Research Clinics*	$0	$2,205	$1,117	$485	$967	$574	$11	$622	$583	$660	$650
Systolic Hypertension in the Elderly Program (SHEP)	4,228	2,447	3,820	2,887	1,295	404	369	—	—	—	—
Studies of Left Ventricular Dysfunction (SOLVD)	3,619	6,200	6,634	4,855	2,325	902	—	—	—	—	—
Cardiac Arrhythmia Suppression Trial (CAST)	5,857	8,125	8,968	9,988	4,872	2,193	—	29	—	—	—
Post Coronary Artery Bypass Graft (CABG) Study	400	4,040	4,050	2,832	3,628	5,195	213	—	—	—	—
Prevention and Treatment of Hypertension Study (PATHS)	—	—	195	399	787	564	585	—	—	—	—
Effects of Digitalis on Survival in Patients with Congestive Heart Failure	—	—	—	604	2,619	3,272	3,464	270	2,235	—	—
Asymptomatic Cardiac Ischemia Pilot Study (ACIP)	—	—	—	—	2,862	2,720	630	210	7	—	—
Psychophysiological Investigations of Myocardial Ischemia (PIMI)	—	—	—	—	335	1,400	1,400	433	165	—	—
Arterial Disease Multifactorial Intervention Trial (ADMIT)	—	—	—	—	—	663	2,062	2,341	395	—	—
Raynaud's Treatment Study	—	—	—	—	—	339	1,131	2,532	1,664	221	19
Antiarrhythmic Versus Implantable Defibrillator (AVID)	—	—	—	—	—	250	1,203	1,068	5,348	2,475	—
Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT)	—	—	—	—	—	—	2,760	10,914	3,412	9,676	15,943
Activity Counseling Trial (ACT)	—	—	—	—	—	—	—	1,260	5,000	—	2,167
Postmenopausal Estrogen/ Progestin Interventions (PEPI)	—	—	—	—	—	—	—	600	1,305	—	3
Enhancing Recovery in Coronary Heart Disease Patients (ENRICHD)	—	—	—	—	—	—	—	—	1,871	6,993	6,837
Atrial Fibrillation Follow-up: Investigation in Rhythm Management (AFFIRM)	—	—	—	—	—	—	—	—	883	2,510	6,330
Beta-Blocker Evaluation Survival Trial (BEST)	—	—	—	—	—	—	—	—	2,500	1,435	2,300
Women's Angiographic Vitamin and Estrogen Trial (WAVE)	—	—	—	—	—	—	—	—	—	731	2,891
Women's Ischemia Syndrome Evaluation (WISE)	—	—	—	—	—	—	—	—	—	1,577	133
Prevention of Events with Angiotensin Converting Enzyme Inhibitor Therapy (PEACE)	—	—	—	—	—	—	—	—	—	3,632	2,838
Subtotal, Heart and Vascular Diseases	14,104	23,017	24,784	22,050	19,690	18,476	13,828	20,279	25,368	29,910	40,111
Lung Diseases											
Lung Health Study I	10,100	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
National Emphysema Treatment Trial (NETT)	—	—	—	—	—	—	—	—	—	—	2,710
Subtotal, Lung Diseases	10,100	2,898	5,349	5,875	8,305	10,496	11,361	14,943	9,916	12,664	12,915

* Includes Coronary Primary Prevention Trial (CPPT) costs. Beginning in 1994, these funds support the Collaborative Centers for International Studies.

Institute-Initiated Clinical Trials: Ending After FY 1991 (continued)

Contracts

(Dollars in Thousands)

	Fiscal Year										
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Blood Diseases and Resources											
Clinical Course of Sickle Cell Disease	3,111	2,328	2,361	2,118	1,609	2,161	1,756	2,390	4,375	376	205
Penicillin Prophylaxis in Sickle Cell Disease (PROPS II)	397	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
Viral Activation Transfusion Study (VATS)	—	—	—	—	—	—	—	—	5,000	5,647	2,353
Cord Blood Stem Cell Transplantation Study	—	—	—	—	—	—	—	—	—	1,419	6,573
Multicenter Study of Hydroxyurea in Sickle Cell Anemia Adult Follow-up (MSH)	—	—	—	—	—	—	—	—	—	703	472
Sub-total, Blood Diseases and Resources	3,508	3,188	3,047	2,978	5,638	3,219	2,851	6,942	13,111	10,312	10,242
Total, NHLBI, Contracts	**$27,712**	**$29,103**	**$33,180**	**$30,903**	**$33,633**	**$32,191**	**$28,040**	**$42,164**	**$48,395**	**$52,886**	**$63,268**

Institute-Initiated Clinical Trials: Ending After FY 1991

Cooperative Agreements

(Dollars in Thousands)

	Fiscal Year										
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Heart and Vascular Diseases											
Trials of Hypertension Prevention (TOHP)	$6,166	$5,020	$4,774	$5,760	$6,846	$5,435	$5,111	$4,385	$1,240	$649	$0
Dietary Intervention Study in Children (DISC)	1,169	2,051	3,023	4,616	2,154	2,018	1,686	1,615	1,625	1,625	746
Bypass Angioplasty Revascularization Investigation (BARI)	716	4,545	5,539	6,216	6,309	3,952	3,978	3,965	3,882	2,757	2,894
Postmenopausal Estrogen/Progestin Interventions (PEPI)	550	2,882	1,336	2,158	2,801	2,554	1,516	1,109	584	331	0
Child and Adolescent Trial for Cardiovascular Health (CATCH)	1,210	1,919	1,977	1,012	5,920	5,501	6,077	2,586	2,342	2,682	3,956
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
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
Subtotal, Heart and Vascular Diseases	9,811	16,417	16,649	19,912	25,526	22,260	24,920	23,554	21,912	17,499	14,871
Lung Diseases											
Asthma Clinical Research Network	—	—	—	—	—	—	2,500	3,694	3,640	4,526	4,479
Asthma and Pregnancy Studies	—	—	—	—	—	—	—	1,000	991	1,000	913
Sub-total, Lung Diseases	—	—	—	—	—	—	2,500	4,694	4,631	5,526	5,392

Institute-Initiated Clinical Trials: Ending After FY 1991 (continued)

Cooperative Agreements

(Dollars in Thousands)

	Fiscal Year										
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Blood Diseases and Resources											
Hydroxyurea in Patients with Sickle Cell Anemia, Phase I	441	479	509	44	—	—	—	—	—	—	—
Trial to Reduce Alloimmunization to Platelets (TRAP)	—	—	747	2,034	2,111	3,483	1,422	—	—	—	—
Subtotal, Blood Diseases and Resources	441	479	1,256	2,078	2,111	3,483	1,422	—	—	—	—
Total, NHLBI, Cooperative Agreements	$10,252	$16,896	$17,905	$21,990	$27,637	$25,743	$28,842	$28,248	$26,543	$23,025	$20,263
Total, NHLBI-Initiated Clinical Trials	$37,964	$45,999	$51,085	$52,893	$61,270	$57,934	$56,882	$70,412	$74,938	$75,911	$83,531

Institute-Initiated Clinical Trials, Fiscal Year 1997: Summary by Program

Contracts

	Total Obligations Prior to FY 1997	Total FY 1997 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Activity Counseling Trial (ACT)	$ 6,259,900	$ 2,166,947	$ 8,426,847
Antiarrhythmic Versus Implantable Defibrillator (AVID)	10,343,617	0	10,343,617
Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack (ALLHAT)	26,762,355	15,943,000	42,705,355
Atrial Fibrillation Follow-up: Investigation in Rhythm Management (AFFIRM)	3,393,386	6,329,829	9,723,215
Beta-Blocker Evaluation Survival Trial (BEST)	3,935,000	2,300,000	6,235,000
Enhancing Recovery in Coronary Heart Disease (ENRICHD)	8,863,861	6,837,000	15,700,861
Lipid Research Clinics	189,838,255	650,000	190,488,255
Postmenopausal Estrogen/Progestin Interventions (PEPI)	1,905,441	3,067	1,908,508
Prevention of Events with Angiotensin Converting Enzyme Inhibitor Therapy (PEACE)	3,631,508	2,837,720	6,469,228
Raynaud's Treatment Study	5,886,219	19,390	5,905,609
Women's Angiographic Vitamin and Estrogen Trial (WAVE)	731,092	2,890,807	3,621,899
Women's Ischemia Syndrome Evaluation (WISE)	1,576,931	133,000	1,709,931
Subtotal, Heart and Vascular Diseases	263,127,565	40,110,760	303,238,325
Lung Diseases			
Acute Respiratory Distress Syndrome Clinical Network (ARDSNET)	10,307,000	4,510,000	14,817,000
Childhood Asthma Management Program (CAMP)	35,467,800	5,695,000	41,162,800
Lung Health Study I	48,938,219	0	48,938,219
National Emphysema Treatment Trial (NETT)	0	2,710,000	2,710,000
Subtotal, Lung Diseases	94,713,019	12,915,000	107,628,019
Blood Diseases and Resources			
Anti-HIV Immunoglobulin (HIVIG) in Prevention of Maternal-Fetal HIV Transmission	8,556,608	0	8,556,608
Clinical Course of Sickle Cell Disease (CSSCD)	55,768,413	205,085	55,973,498
Cord Blood Stem Cell Transplantation Study	1,418,661	6,573,000	7,991,661
Multicenter Study of Hydroxyurea in Sickle Cell Anemia (MSH) Adult Follow-Up	703,608	472,115	703,608
Penicillin Prophylaxis in Sickle Cell Disease (PROPS II)	6,195,145	0	6,195,145
T-Cell Depletion in Unrelated Donor Marrow	4,688,733	639,000	5,327,733
Viral Activition Transfusion Study (VATS)	10,647,420	2,353,135	13,000,555
Subtotal, Blood Diseases and Resources	87,978,588	10,242,335	97,748,808
Total, NHLBI, Clinical Trials—Contracts	**$445,819,172**	**$63,268,095**	**$508,615,152**

Institute-Initiated Clinical Trials, Fiscal Year 1997: Summary by Program (continued)

Cooperative Agreements

	Total Obligations Prior to FY 1997*	Total FY 1997 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Bypass Angioplasty Revascularization Investigation (BARI)	$ 41,860,710	$ 2,893,990	$ 44,754,700
Child and Adolescent Trial for Cardiovascular Health (CATCH)	31,225,642	3,956,296	35,181,938
Dietary Approaches to Stop Hypertension (DASH)	7,412,506	0	7,412,506
Dietary Effects on Lipoproteins and Thrombogenic Activity (DELTA)	10,901,663	290,107	11,191,770
Dietary Intervention Study in Children (DISC)	21,582,399	746,051	22,328,450
Obesity Prevention in American Indians (PATHWAYS)	9,085,083	4,118,525	13,203,608
Postmenopausal Estrogen/Progestin Interventions (PEPI)	15,826,700	0	15,826,700
Rapid Early Action for Coronary Treatment (REACT)	12,691,438	2,866,223	15,557,661
Trials of Hypertension Prevention (TOHP)	46,884,735	0	46,884,735
Subtotal, Heart and Vascular Diseases	197,470,876	14,871,192	212,342,068
Lung Diseases			
Asthma Clinical Research Network (ACRN)	14,360,831	4,479,165	18,839,996
Asthma and Pregnancy Studies	2,990,603	912,950	3,903,553
Subtotal, Lung Diseases	17,351,434	5,392,115	22,743,549
Blood Diseases and Resources			
Subtotal, Blood Diseases and Resources	0	0	0
Total, NHLBI, Cooperative Agreements	**$214,822,310**	**$20,263,307**	**$235,085,617**
Total, NHLBI-Initiated Clinical Trials	**$660,641,482**	**$83,531,402**	**$743,700,769**

* Includes FY 1976 Transition Quarter.

Heart and Vascular Diseases Program

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

This trial will test the effectiveness of various behavioral interventions delivered in health care settings to increase physical activity among sedentary patients seen in primary care settings. A staff-assistance intervention, a staff-counseling intervention, and a control group receiving only physician advice will be compared for effects on physical activity and cardiorespiratory fitness.

Obligations

Funding History:
Fiscal Year 1997—$2,166,947
Fiscal Year 1994-96—$6,259,900
Total Funding to Date—$8,426,847

Current Active Organizations and Contract Numbers

1. Cooper Institute for Aerobics Research, Dallas, Texas —HC-45135
2. Leland Stanford Junior University Stanford, California —HC-45136
3. University of Tennessee, Memphis, Tennessee —HC-45137
4. Wake Forest University Winston Salem, North Carolina —HC-45138

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

This randomized clinical trial evaluates whether the use of an implantable cardiac defibrillator (ICD) would result in reduction in total mortality, when 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. A pilot phase was completed in June 1994 with 200 patients; the full-scale trial with 1,016 patients 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 1997—0
Fiscal Years 1992-96—$10,343,617
Total Funding to Date—$10,343,617

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 the combined incidence of fatal CHD and nonfatal myocardial infarction (MI) differs between diuretic-based and newer antihypertensive treatments (ACE inhibitor calcium channel blocker, alpha blocker) in high-risk hypertensive patients. The lipid-lowering component of the study will determine whether lowering serum cholesterol with an HMG CoA reductase inhibitor will reduce the total mortality in a subset of hypertensive patients with moderately elevated LDL cholesterol.

Obligations

Funding History:
Fiscal Year 1997—$15,943,000
Fiscal Year 1993-96—$26,762,355
Total Funding to Date—$42,705,355

Current Active Organization and Contract Number

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

Atrial Fibrillation Followup: Investigation in Rhythm Management (AFFIRM), Initiated in Fiscal Year 1995

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

Obligations

Funding History:
Fiscal Year 1997—$6,329,829
Fiscal Year 1995-96—$3,393,386
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 the addition of a beta-blocking agent (bucindolol) to standard therapy reduces the total mortality of patients with moderate to severe congestive heart failure.

Obligations

Funding History:
Fiscal Year 1997—$2,300,000
Fiscal Year 1995-96—$3,935,000
Total Funding to Date—$6,235,000

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 CABG surgery in patients who require revascularization and have coronary anatomy suitable for either procedure.

Obligations

Funding History:
Fiscal Year 1997—$2,893,990
Fiscal Years 1987-96—$41,860,710
Total Funding to Date—$44,754,700

Current Active Organizations and Grant Numbers

Clinical Units

1. Mayo Foundation, Rochester, Minnesota —HL-38493
2. St. 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. St. Louis University, St. Louis, Missouri —HL-42145

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

This trial examines the effectiveness of school and home interventions for reducing CVD risk. Intervention components include a school food service program, a physical education program, a classroom curriculum, and a home curriculum. The children's behavioral and physiological risk factors will be tracked into their adolescent years.

Obligations

Funding History:
Fiscal Year 1997—$3,956,296
Fiscal Years 1987-96—$31,225,642
Total Funding to Date—$35,181,938

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 School 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 Institute, Inc., Watertown, Massachusetts —HL-47098

Dietary Approaches to Stop Hypertension (DASH), Initiated in Fiscal Year 1993

The object of the study is to conduct a collaborative, multicenter study to test the effectiveness of several dietary patterns in lowering blood pressure.

Obligations

Funding History:
Fiscal Year 1997—0
Fiscal Years 1993-96—$7,412,506
Total Funding to Date—$7,412,506

Current Active Organizations and Grant Numbers

1. Coordinating Center: Kaiser Foundation Research Institute, Oakland, California —HL-50982
2. Pennington Biomedical Research Center, Baton Rouge, Louisiana —HL-50968
3. Brigham and Women's Hospital, Boston, Massachusetts —HL-50972
4. Duke University, Durham, North Carolina —HL-50977
5. The Johns Hopkins University, Baltimore, Maryland —HL-50981

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 1997—$290,107
Fiscal Years 1992-96—$10,901,663
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 is 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 1997—$746,051
Fiscal Years 1987-96—$21,582,399
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 (ENRICHD), 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 the primary end points. Secondary outcomes include health-related quality of life and adherence to medical and lifestyle change regiments.

Obligations

Funding History:
Fiscal Year 1997—$6,837,000
Fiscal Years 1995-96—$8,863,861
Total Funding to Date—$15,700,861

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

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 the primary prevention of obesity among American Indian elementary school children.

Obligations

Funding History:
Fiscal Year 1997—$4,118,525
Fiscal Years 1993-95—$9,085,083
Total Funding to Date—$13,203,608

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, 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 followup to assess endometrial and breast cancer risk was begun with contract support.

Obligations

Funding History: Contracts
Fiscal Year 1997—$3,067
Fiscal Years 1994-96—$1,905,441
Total Funding to Date—$1,908,508

Funding History: Cooperative Agreements
Fiscal Year 1997—$0
Fiscal Years 1987-96—$15,826,700
Total Funding to Date—$15,826,700

Current Active Organization and Contract Number

1. 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 will determine whether the addition of angiotensin converting enzyme (ACE) inhibitor to standard therapy in patients with known coronary artery disease and preserved left ventricular function will prevent CVD mortality and reduce the risk of experiencing a myocardial infarction.

Obligations

Funding History:
Fiscal Year 1997—$2,837,720
Fiscal Year 1996—$3,631,508
Total Funding to Date—$6,469,228

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 will include provider and patient education, public education, and community organization.

Obligations

Funding History:
Fiscal Year 1997—$2,866,223
Fiscal Year 1994-96—$12,691,438
Total Funding to Date—$15,557,661

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 Institute, 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 primary goal of this randomized multicenter clinical trial of primary Raynaud's patients (N = 313) is to test the efficacy of Nifedipine XL and temperature biofeedback and to compare the two treatments. The primary outcome is a self-reported, 1-month attack rate collected 1 year after randomization. Results are expected by fall of 1996.

Obligations

Funding History:
Fiscal Year 1997—$19,390
Fiscal Year 1992-96—$5,886,219
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 is testing 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 1997—$0
Fiscal Years 1986-96—$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 will assess whether or not hormone replacement therapy and/or antioxidant treatment will stabilize or inhibit progression and induce regression of coronary plaques in women. The trial will also elucidate the mechanisms by which these treatments modify atherosclerosis. The primary end points are angiographic changes.

Obligations

Funding History:
Fiscal Year 1997—$2,890,807
Fiscal Year 1996—$731,092
Total Funding to Date—$3,621,899

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 the 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 1997—$133,000
Fiscal Year 1996—$1,578,931
Total Funding to Date—$1,709,931

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. It is anticipated that several protocols will be developed and carried out during the project period.

Obligations

Funding History:
Fiscal Year 1997—$4,510,000
Fiscal Years 1994-96—$10,307,000
Total Funding to Date—$14,817,000

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

Obligations

Funding History:
Fiscal Year 1997—$4,479,165
Fiscal Years 1993-96—$14,360,831
Total Funding to Date—$18,839,996

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 aimed at determining the effects of asthma and its treatment on pregnancy and how pregnancy affects asthma. Women will be enrolled from 11 clinical centers as part of the NICHD Maternal Fetal Medicine Units Clinical Network.

Obligations

Funding History:
Fiscal Year 1997—$912,950
Fiscal Years 1994-96—$2,990,603
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 is to determine, in a population of 5- to 9-year-old children with asthma, if, in combination with beta$_2$ agonist bronchodilator as needed, regular use of either of two types of anti-inflammatory medications results in greater lung function and less bronchial hyperresponsiveness, patient morbidity, use of health care resources, and

improved quality of life during a 5-year period. The study will also compare the long-term safety and side effects of the three medications during the 5-year period.

Obligations

Funding History:
Fiscal Year 1997—$5,695,000
Fiscal Years 1991-96—$35,467,800
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, 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 I, Initiated in Fiscal Year 1984

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

Obligations

Funding History:
Fiscal Year 1997—$0
Fiscal Years 1984-96—$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 National Emphysema Treatment Trial (NETT) is a multicenter trial that is associated with a prospective registry. It is designed to evaluate the efficacy and role of lung volume reduction surgery in the treatment of severe emphysema. If the study finds the surgery effective, a major secondary objective of the trial is to determine which patients are most likely to benefit. Lung volume reduction surgery is a procedure in which part of the lung is removed in an attempt to improve the breathing ability of emphysema patients..

Obligations

Funding History:
Fiscal Year 1997—$2,710,000
Total Funding to Date—$2,710,000

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 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

Anti-HIV Immunoglobulin (HIVIG) in Prevention of Maternal-Fetal HIV Transmission, Initiated in Fiscal Year 1991

The objective of this study is to evaluate the potential benefits of anti-HIVIG in reducing the rate of infection of infants born to HIV-infected women. More than 50 clinical centers have been selected to participate in this trial.

Obligations

Funding History:
Fiscal Year 1997—$0
Fiscal Years 1991-95—$8,556,608
Total Funding to Date—$8,556,608

Current Active Organization and Contract Number

1. North American Biologics, Inc., Miami, Florida —HB-57128

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, sickle cell disease.

Obligations

Funding History:
Fiscal Year 1997—$205,085
Fiscal Years 1977-96—$55,768,413
Total Funding to Date—$55,973,498

Current Active Organization and Contract Number

1. Interfaith Medical Center, Brooklyn, New York, New York —HB-47105

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 is a safe and efficient alternative to bone marrow transplantation for children and adults with a variety of cancers, blood diseases, and genetic disorders. The study includes a Coordinating Center, seven Transplant Centers, and three Collection and Storage Centers.

Obligations

Funding History:
Fiscal Year 1997—$6,573,000
Fiscal Year 1996—$1,418,661
Total Funding to Date—$7,991,661

Current Active Organizations and Contract Numbers

1. Emmes Corporation, Potomac, Maryland —HB-67132
2. Dana-Farber Cancer Center, Boston, Massachusetts —HB-67133
3. Fred Hutchinson Cancer Research Center, Seattle, Washington —HB-67134
4. University of California 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

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

The MSH was a randomized, double-blind, placebo-controlled trial conducted at 21 clinical centers. The trial 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 1997—$472,115
Fiscal Year 1996—$703,608
Total Funding to Date—$1,175,723

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 (GvHD) can be achieved without a counterbalancing increase in relapse of leukemia in patients receiving an unrelated donor marrow transplant.

Obligations

Funding History:
Fiscal Year 1997—$639,000
Fiscal Years 1994-96—$4,688,733
Total Funding to Date—$5,327,733

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 will also evaluate 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

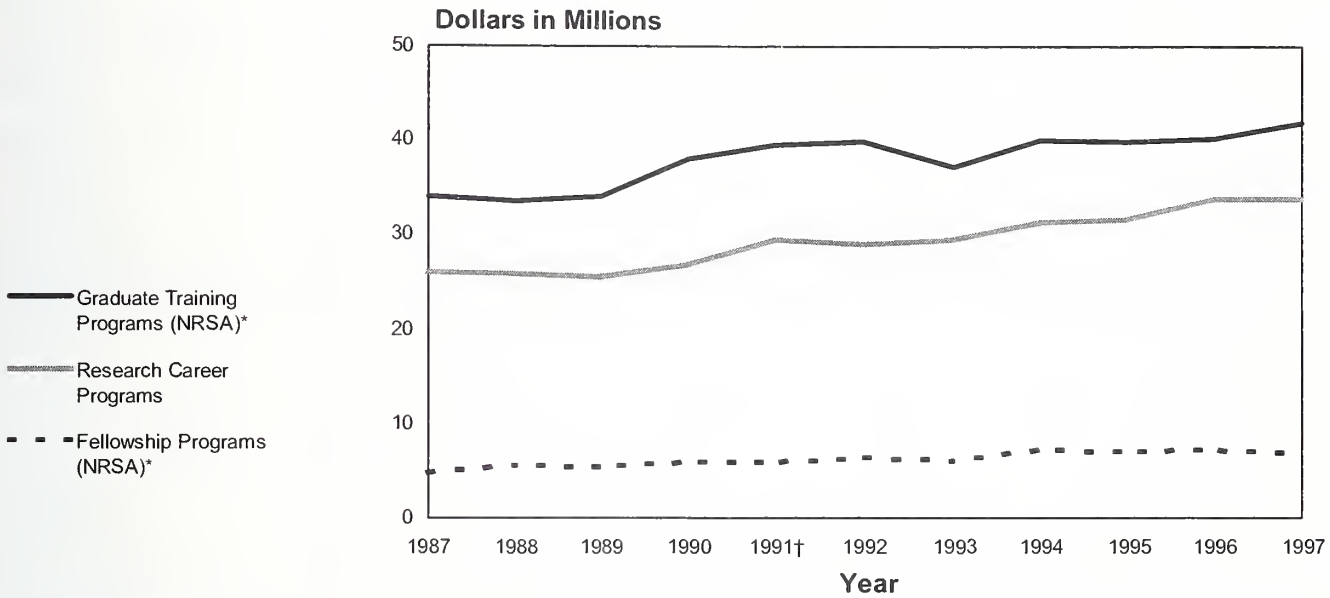
Funding History:
Fiscal Year 1997—$2,353,135
Fiscal Year 1995-96—$10,647,420
Total Funding to Date—$13,000,555

Current Active Organizations and Contract Numbers

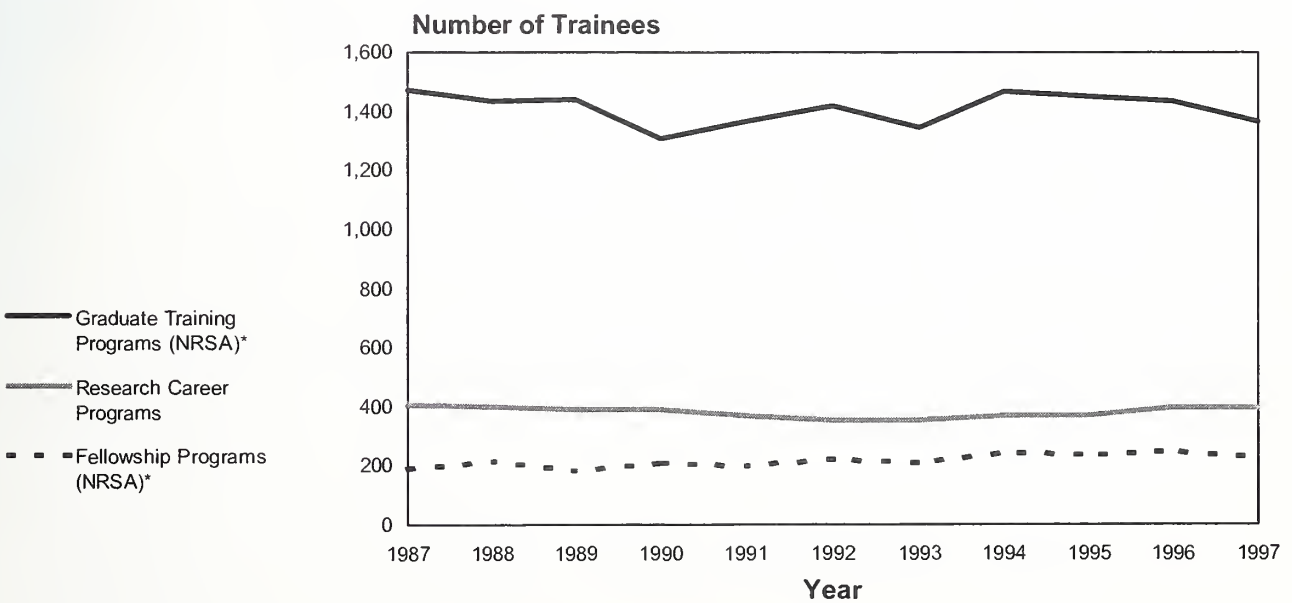
1. Case Western Reserve University, Cleveland, Ohio —HB-57115
2. Georgetown University, Washington, DC —HB-57116
3. The Miriam Hospital, Providence, Rhode Island —HB-57117
4. Mt. Sinai Medical Center, New York, New York —HB-57118
5. The Ohio State University, Columbus, Ohio —HB-57119
6. University of California, San Diego, La Jolla, California —HB-57120
7. University of California, San Francisco, San Francisco, California —HB-57121
8. University of North Carolina at Chapel Hill, 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 Institute, Inc., Watertown, Massachusetts —HB-57127

12. Research Training and Career Development Programs

NHLBI Research Training and Career Development Obligations: Fiscal Years 1987-97



NHLBI Full-Time Training Positions: Fiscal Years 1987-97



* 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 1997

	Number of Awards Obligated	Trainees (Full-Time Training Positions)	Direct Cost	Indirect Cost	Total Cost	Percent of Total NHLBI Training Program Dollars
Fellowship Programs						
Predoctoral Fellowship Award for Minority Students (F31)	15	15	$ 388,262	$ 0	$ 388,262	.8%
Individual NRSA (F32)	210	210	6,281,447	0	6,281,447	12.8
Senior Fellowships NRSA (F33)	5	5	178,500	0	178,500	0.4
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	230	230	6,848,209	0	6,848,209	14.0
Graduate Training Programs						
Institutional NRSA (T32)	179	1,179	35,877,794	2,375,423	38,253,217	78.4
Minority Institutional NRSA (T32)	7	43	850,423	47,858	898,281	1.8
Off-Quarter Professional Student Training NRSA (T34, T35)	13	68	1,125,782	90,022	1,215,804	2.5
Minority Access to Research Careers (MARC) (T36)	0	0	5,000	0	5,000	0.0
Short-Term Training for Minority Students (T35M)	34	75	1,492,639	119,330	1,611,969	3.3
Subtotal, Training Grants	233	1,365	39,351,638	2,632,633	41,984,271*	86.0
Total, Training Programs	**463**	**1,595**	**$46,199,847**	**$2,632,633**	**$48,832,480***	**100.0%**

* Excludes assessment of $1,004,000.

History of Training Obligations by Activity: Fiscal Years 1987-97

(Dollars in Thousands)

	Fiscal Year										
	1987	1988	1989*	1990	1991*	1992	1993	1994	1995	1996	1997
Fellowship Programs											
Predoctoral Fellowship Award for Minority Students (F31)	$ —	$ —	$ —	$ —	$ —	$ 55	$ 97	$ 199	$ 304	$ 551	$ 388
Individual NRSA (F32)	4,599	5,350	5,271	5,654	5,554	6,041	5,867	6,853	6,651	6,483	6,281
Senior Fellowships NRSA (F33)	121	6	95	129	205	141	141	141	99	233	179
Minority Access to Research Careers Fellowships NRSA (F34)	26	53	13	—	—	—	—	—	—	—	—
Intramural NRSA (F35)	138	147	30	91	133	146	70	69	49	—	—
Subtotal, Fellowships	4,884	5,556	5,409	5,874	5,892	6,383	6,175	7,262	7,103	7,267	6,848
Graduate Training Programs											
Institutional NRSA (T32)	32,483	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]
Minority Institutional NRSA (T32)	283	288	348	398	432	684	35	735	982	679	898
Minority Summer Hypertension NRSA (T35, T34)	320	126	80	—	—	—	—	—	—	—	—
Minority Summer Pulmonary NRSA (T34, T35)	2	24	—	—	—	—	—	—	—	—	—
Off-Quarter Professional Student Training NRSA (T34, T35)	1,069	1,068	1,386	957	1,150	1,106	1,744	1,132	951	1,001	1,216
Minority Access to Research Careers (MARC) (T36)	7	14	10	19	19	22	15	5	5	5	5
Short-Term Training for Minority Students (T35M)	—	—	—	—	339	717	573	1,616	1,760	1,834	1,612
Subtotal, Training Grants	34,164	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]
Total, Training Programs	**$39,048**	**$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]**

* 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.

Full-Time Training Positions* by Activity: Fiscal Years 1987-97

(Number of Positions)

	Fiscal Year										
	1987	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**
Fellowship Programs											
Predoctoral Fellowship Award for Minority Students (F31)	—	—	—	—	—	3	4	7	13	21	15
Individual NRSA (F32)	182	210	184	206	191	209	200	229	222	220	210
Senior Fellowships NRSA (F33)	5	1	3	5	6	4	4	4	4	7	5
Minority Access to Research Careers (MARC) Fellowships NRSA (F34)	1	2	—	—	—	—	—	—	—	—	—
Intramural NRSA (F35)	5	5	1	3	4	5	3	2	2	—	—
Subtotal, Fellowships	193	218	188	214	201	221	211	242	241	248	230
Graduate Training Programs											
Institutional NRSA (T32)	1,304	1,278	1,257	1,205	1,218	1,240	1,124	1,237	1,201	1,216	1,179
Minority Institutional NRSA (T32)	16	18	30	21	19	24	1	30	47	30	43
Minority Summer Hypertension NRSA (T34, T35)	23	6	5	—	—	—	—	—	—	—	—
Minority Summer Pulmonary NRSA (T34, T35)	3	3	—	—	—	—	—	—	—	—	—
Off-Quarter Professional Student Training NRSA (T34, T35)	127	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	1,473	1,437	1,440	1,305	1,366	1,419	1,346	1,469	1,449	1,437	1,365
Total, Training Programs	**1,666**	**1,655**	**1,628**	**1,519**	**1,567**	**1,640**	**1,557**	**1,711**	**1,690**	**1,685**	**1,595**

* Recommended positions.

NHLBI Research Career Programs: Fiscal Years 1987-97

(Number of Awards)

Program	Fiscal Year 1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Mentored Research Development Award for Minority Faculty (K01)	—	—	—	—	—	—	—	—	—	—	5
Minority Institution Faculty Mentored Research Scientist Award (K01)	—	—	—	—	—	—	—	—	—	—	1
Research Scientist Development Award (K02)	—	—	—	—	—	—	—	—	—	3	8
Research Career Development Award (K04)	103	103	92	74	65	50	40	34	30	25	18
Research Career Award (K06)	11	11	11	9	8	7	6	3	3	3	3
Preventive Cardiology Academic Award (K07)	25	20	22	22	23	18	14	11	7	—	—
Pulmonary Academic Award (K07)	4	—	—	—	—	—	—	—	—	—	—
Preventive Pulmonary Academic Award (K07)	5	8	12	16	20	14	11	8	4	—	—
Transfusion Medicine Academic Award (K07)	25	23	20	18	18	14	12	9	5	2	—
Systemic Pulmonary and Vascular Diseases Academic Award (K07)	—	—	—	—	2	6	11	11	15	11	9
Asthma Academic Award (K07)	—	—	—	—	—	—	3	6	9	9	9
Tuberculosis Academic Award (K07)	—	—	—	—	—	—	6	12	15	19	23
Sleep Academic Award (K07)	—	—	—	—	—	—	—	—	—	8	12
Pulmonary Faculty Development Award (K08)	—	—	—	—	—	—	—	—	—	—	—
Clinical Investigator Award (K08)	157	146	135	141	137	152	180	208	222	254	267
Physician Scientist Award (K11)	59	74	77	90	82	79	60	46	22	12	—
Minority School Faculty Development Award (K14)	18	21	22	22	18	18	15	12	11	15	9
Research Development Award for Minority Faculty (K14)	—	—	—	—	—	—	—	13	28	36	34
Total	**407**	**406**	**391**	**392**	**373**	**358**	**358**	**373**	**371**	**397**	**398**

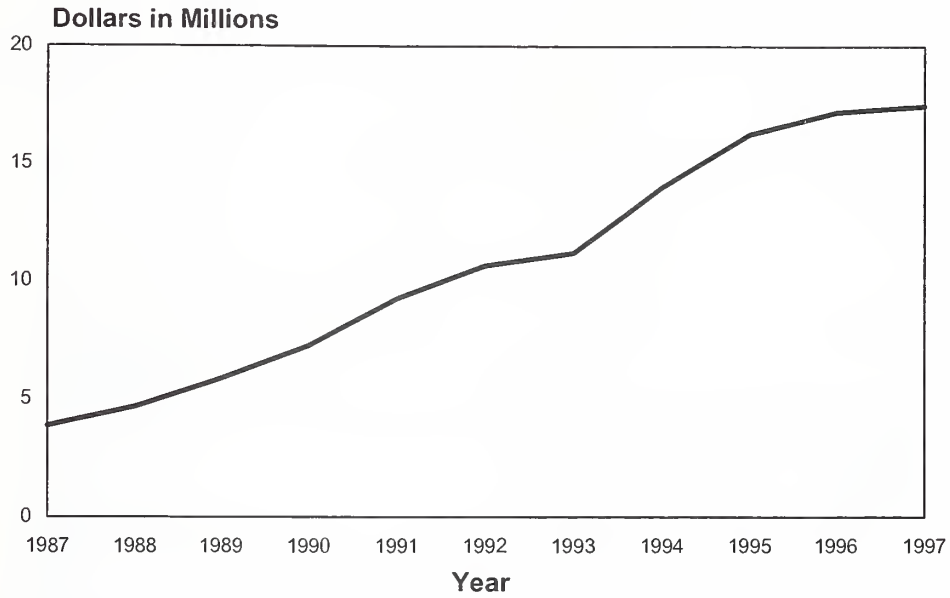
NHLBI Research Career Programs Obligations: Fiscal Years 1987-97

(Dollars in Thousands)

Program	Fiscal Year 1987	1988	1989	1990	1991*	1992	1993	1994	1995	1996	1997
Mentored Research Development Award for Minority Faculty (K01)	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ 460
Minority Institution Faculty Mentored Research Scientist Award (K01)	—	—	—	—	—	—	—	—	—	—	106
Research Scientist Development Award (K02)	—	—	—	—	—	—	—	—	—	207	545
Research Career Development Award (K04)	5,377	5,376	4,859	4,609	4,279	3,221	2,595	2,224	2,006	1,693	1,226
Research Career Award (K06)	363	364	331	303	270	239	194	102	104	105	103
Preventive Cardiology Academic Award (K07)	2,805	2,303	2,618	2,526	2,921	2,376	1,801	1,397	957	—	—
Pulmonary Academic Award (K07)	309	—	—	—	—	—	—	—	—	—	—
Preventive Pulmonary Academic Award (K07)	422	663	984	1,301	1,851	1,332	1,040	726	309	—	—
Transfusion Medicine Academic Award (K07)	1,953	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
Asthma Academic Award (K07)	—	—	—	—	—	—	233	502	749	740	764
Tuberculosis Academic Award (K07)	—	—	—	—	—	—	454	906	1,155	1,496	1,831
Sleep Academic Award (K07)	—	—	—	—	—	—	—	—	—	699	1,027
Pulmonary Faculty Development Award (K08)	—	—	—	—	—	—	—	—	—	—	—
Clinical Investigator Award (K08)	9,766	8,913	8,445	8,860	10,370	11,733	14,125	16,635	18,090	21,093	22,238
Physician Scientist Award (K11)	4,074	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)	1,012	1,256	1,280	1,334	1,226	1,265	1,081	893	810	1,158	729
Research Development Award for Minority Faculty (K14)	—	—	—	—	—	—	—	1,289	2,812	3,607	3,468
Total	**$26,081**	**$25,937**	**$25,564**	**$26,899**	**$29,468**	**$29,110**	**$29,608**	**$31,398**	**$31,675**	**$33,862**	**$33,912**

* 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 1987-97



NHLBI Minority Biomedical Research Training, Career Development, and Research Supplements Program Obligations: Fiscal Years 1987-97

(Dollars in Thousands)

Program	Fiscal Year 1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Minority Biomedical Research Support (MBRS)	$2,241	$2,416	$2,368	$2,418	$2,561	$2,672	$2,540	$2,433	$2,313	$2,503	$2,722
Minority Access to Research Careers (MARC)	33	67	23	19	—	—	—	—	—	5	5
Minority Hypertension Research Development Summer Program	320	126	80	—	—	—	—	—	—	—	—
Minority Pulmonary Research Development Summer Program	2	25	—	—	—	—	—	—	—	—	—
Minority Institutional Research Training Program	283	288	348	398	567	684	608	735	982	679	898
Minority School Faculty Development Award	1,012	1,256	1,280	1,334	1,226	1,265	1,081	893	810	1,158	729
Research Development Award for Minority Faculty	—	—	—	—	—	—	—	1,289	2,812	3,607	3,468
Minority Research Supplements Programs	—	485	1,763	3,059	4,596	5,367	6,273	6,754	7,264	6,714	7,021
Reentry Supplements	—	—	—	—	—	—	—	—	—	140	89
MARC Summer Research Training Program	—	—	25	34	32	20	48	31	28	32	17
Short-Term Training for Minority Students	—	—	—	—	339	717	573	1,616	1,760	1,834	1,612
Minority Predoctoral Fellowship	—	—	—	—	—	55	114	199	304	551	388
Mentored Research Development Award for Minority Faculty	—	—	—	—	—	—	—	—	—	—	460
Minority Institution Faculty Mentored Research Scientist Award	—	—	—	—	—	—	—	—	—	—	106
Total Minority Programs	**$3,891**	**$4,663**	**$5,887**	**$7,262**	**$9,321**	**$10,780**	**$11,237**	**$13,950**	**$16,273**	**$17,223**	**$17,515**

NHLBI Research Supplements Program for Underrepresented Minorities by Award Type: Fiscal Years 1987-97

(Number of Awards)

Award Type	Fiscal Year 1986-87	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Investigator	—	12	33	50	54	45	51	46	49	42	38
Postdoctoral	—	—	—	—	9	25	29	31	39	49	47
Graduate	—	—	6	16	24	37	45	55	42	37	36
Undergraduate	—	—	4	11	16	22	20	35	27	12	23
High School	—	—	—	—	2	1	5	15	10	8	9
Reentry Supplements	—	—	—	—	—	—	—	—	—	2	2
Total	**—**	**12**	**43**	**77**	**105**	**130**	**150**	**182**	**167**	**150**	**155**

NHLBI Research Supplements Program Obligations for Underrepresented Minorities by Award Type: Fiscal Years 1987-97

(Dollars in Thousands)

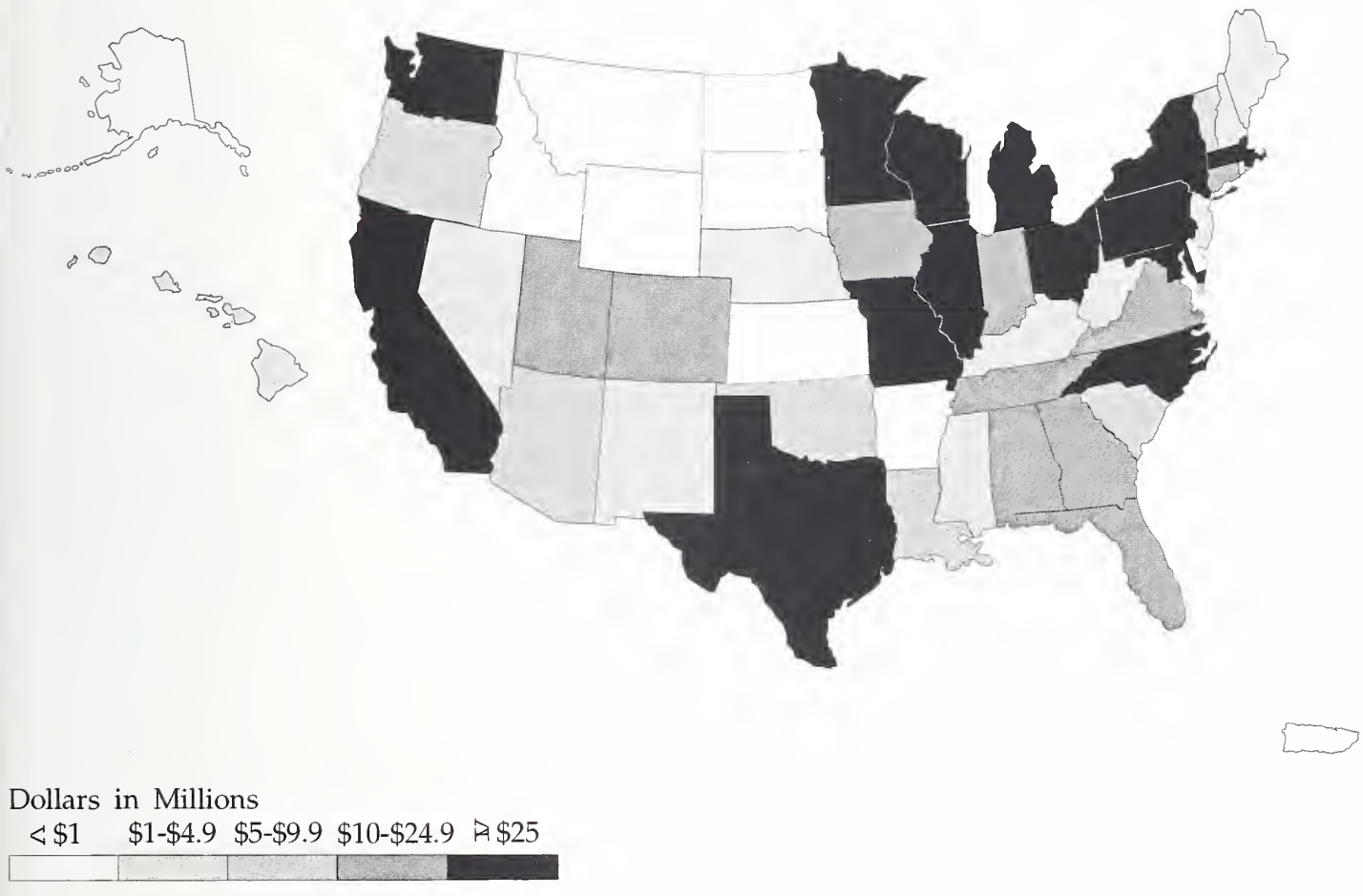
Award Type	Fiscal Year 1985-87	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Investigator	$ —	$485	$1,626	$2,749	$3,449	$2,959	$3,270	$2,894	$3,319	$2,552	$2,412
Postdoctoral*	—	—	—	—	478	1,392	1,574	1,882	2,153	2,899	3,172
Graduate†	—	—	99	255	501	843	1,263	1,585	1,402	1,116	1,181
Undergraduate†	—	—	19	55	162	171	150	332	351	120	273
High School*	—	—	—	—	6	3	16	61	40	27	32
Reentry Supplements	—	—	—	—	—	—	—	—	—	140	152
Total	$ —	$485	$1,744	$3,059	$4,596	$5,368	$6,273	$6,754	$7,265	$6,854	$7,221

* Implemented in FY 1991.

† Implemented in FY 1989.

13. Geographic Distribution of Awards: Fiscal Year 1997

Geographic Distribution of Awards by State: Fiscal Year 1997



Geographic Distribution of Awards by State or Country: Fiscal Year 1997

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
Alabama								
Alabama State University	0	$ 72,078	0	$ 72,078	0	$ 0	0	$ 0
Atherotech, Inc.	1	201,280	1	201,280	0	0	0	0
Auburn University at Auburn	1	35,300	0	0	1	35,300	0	0
Avanti Polar Lipids	1	99,462	1	99,462	0	0	0	0
Computational Fluid Dynamics Research Corporation	1	384,420	1	384,420	0	0	0	0
Elgavish Paramagnetics	1	99,279	1	99,279	0	0	0	0
Tuskegee University	1	58,086	1	58,086	0	0	0	0
University of Alabama at Birmingham	72	16,368,203	59	14,007,076	9	1,084,763	4	1,276,364
University of South Alabama	12	3,242,175	12	3,242,175	0	0	0	0
Total, Alabama	**90**	**20,560,283**	**76**	**18,163,856**	**10**	**1,120,063**	**4**	**1,276,364**
Arizona								
Gila River Indian Community Council	1	440,744	1	440,744	0	0	0	0
Materials and Electrochemical Research	1	370,370	1	370,370	0	0	0	0
Mayo Clinic Arizona	1	2,492	0	0	1	2,492	0	0
Northern Arizona University	0	34,787	0	34,787	0	0	0	0
University of Arizona	21	5,083,968	18	4,722,933	3	361,035	0	0
Total, Arizona	**24**	**5,932,361**	**20**	**5,568,834**	**4**	**363,527**	**0**	**0**
Arkansas								
University of Arkansas Medical Sciences, Little Rock	3	512,410	3	512,410	0	0	0	0
Total, Arkansas	**3**	**512,410**	**3**	**512,410**	**0**	**0**	**0**	**0**
California								
Anatomix	1	93,575	1	93,575	0	0	0	0
Aradigm Corporation	1	99,750	1	99,750	0	0	0	
Beckman Research Institute	1	263,228	1	263,228	0	0	0	0
Burnham Institute	2	347,073	1	315,873	1	31,200	0	0
California Institute of Technology	2	240,439	1	216,019	1	24,420	0	0
California Pacific Medical Center-Pacific Campus	0	113,423	0	113,423	0	0	0	0
California State University, Los Angeles	0	91,828	0	91,828	0	0	0	0
Cedars-Sinai Medical Center	9	1,541,828	8	1,448,652	0	0	1	93,176
Cerus Corporation	2	669,211	2	669,211	0	0	0	0
Charles R. Drew University of Medicine and Science	1	207,195	0	0	1	207,195	0	0
Children's Hospital Medical Center Northern California, Oakland	3	638,979	2	590,390	1	48,589	0	0
Children's Hospital of Los Angeles	4	1,728,374	4	1,728,374	0	0	0	0

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
California (continued)								
Children's Hospital of Orange County	1	16,262	0	0	0	0	1	16,262
City of Hope National Medical Center	1	569,317	1	569,317	0	0	0	0
Clonetics Corporation	1	146,300	1	146,300	0	0	0	0
Gen-Probe, Inc.	1	3,505,313	0	0	0	0	1	3,505,313
Genetronics, Inc.	1	99,909	1	99,909	0	0	0	0
Harbor-UCLA Research and Educational Institute	6	99,461	6	99,461	0	0	0	0
Health Promotion Services, Inc.	1	494,507	1	494,507	0	0	0	0
Institute of Critical Care Medicine	1	184,460	1	184,460	0	0	0	0
Invitrogen Corporation	1	99,778	1	99,778	0	0	0	0
Irwin Memorial Blood Centers	1	291,042	0	0	0	0	1	291,042
J. David Gladstone Institutes	6	4,380,240	6	4,380,240	0	0	0	0
J.F. Clauser and Associates	0	0	0	0	0	0	0	0
Kaiser Foundation Hospitals	1	400,241	1	400,241	0	0	0	0
Kaiser Foundation Research Institute	6	3,063,343	6	3,063,343	0	0	0	0
Konigsberg Instruments	1	205,609	1	205,609	0	0	0	0
La Jolla Institute for Allergy and Immunology	1	29,900	0	0	1	29,900	0	0
Life Measurement Instrument	1	95,760	1	95,760	0	0	0	0
Loma Linda University	3	505,384	3	505,384	0	0	0	0
Medicalworks	1	269,720	1	269,720	0	0	0	0
Medinox, Inc.	1	66,696	1	66,696	0	0	0	0
Nimbus, Inc.	3	2,006,212	2	737,201	0	0	1	1,269,011
Northern California Institute of Research and Education	6	1,010,022	6	1,010,022	0	0	0	0
Pacific Biometrics	1	98,451	1	98,451	0	0	0	0
Palo Alto Institute for Research and Education	1	151,341	1	151,341	0	0	0	0
Palo Alto Medical Foundation Research Institute	2	352,675	2	352,675	0	0	0	0
Polymer Technology Group, Inc.	1	78,520	1	78,520	0	0	0	0
Precision Haemostatics, Inc.	1	100,000	1	100,000	0	0	0	0
Prizm Pharmaceuticals, Inc.	1	100,000	1	100,000	0	0	0	0
Public Health Foundation Enterprises	1	324,300	1	324,300	0	0	0	0
Salk Institute for Biological Studies	3	622,057	2	596,637	1	25,420	0	0
San Diego State University	10	4,590,973	10	4,590,973	0	0	0	0
SCIOS, Inc.	3	560,537	3	560,537	0	0	0	0
Scripps Research Institute	44	16,054,602	36	15,385,889	8	668,713	0	0
Somagenics	1	99,453	1	99,453	0	0	0	0
SRI International	1	841,797	1	841,797	0	0	0	0
Stanford University	43	13,204,074	30	10,096,910	11	820,354	2	2,286,810

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
California (continued)								
University of California, Lawrence Berkeley Laboratory	10	4,775,735	10	4,775,735	0	0	0	0
University of California, Berkeley	4	957,999	3	770,454	1	187,545	0	0
University of California, Davis	28	7,315,862	27	6,369,188	0	0	1	946,674
University of California, Irvine	9	1,793,269	8	1,768,977	1	24,292	0	0
University of California, Los Angeles	46	18,663,948	43	15,206,381	0	0	3	3,457,567
University of California, Riverside	2	488,514	2	488,514	0	0	0	0
University of California, San Diego	71	26,998,341	54	24,518,703	14	1,895,403	3	584,235
University of California, San Francisco	82	29,121,694	70	26,976,016	9	1,352,730	3	792,948
University of California, Santa Barbara	4	277,147	2	214,047	2	63,100	0	0
University of California, Santa Cruz	0	5,000	0	0	0	5,000	0	0
University of Southern California	23	9,077,223	21	8,549,740	1	28,600	1	498,883
Veterans Medical Research Foundation, San Diego	2	315,135	2	315,135	0	0	0	0
Total, California	**465**	**161,443,026**	**394**	**142,288,644**	**53**	**5,412,461**	**18**	**13,741,921**
Colorado								
Analase LLC	1	99,792	1	99,792	0	0	0	0
Children's Hospital, Denver	1	72,304	1	72,304	0	0	0	0
Colorado State University	1	193,475	0	163,575	1	29,900	0	0
Denver City-County Health and Hospitals Department	0	121,328	0	121,328	0	0	0	0
Displaytech, Inc.	1	357,278	1	357,278	0	0	0	0
Eleanor Roosevelt Institute for Cancer Research	1	350,808	1	350,808	0	0	0	0
Keystone Center	1	10,000	1	10,000	0	0	0	0
National Jewish Medicine and Research Center	25	11,057,182	20	9,702,980	2	218,076	3	1,136,126
Picolight, Inc.	1	99,939	1	99,939	0	0	0	0
University of Colorado at Boulder	7	968,987	4	762,882	3	206,105	0	0
University of Colorado Health Sciences Center	33	9,462,499	28	8,334,243	4	858,641	1	269,615
Total, Colorado	**72**	**22,793,592**	**58**	**20,075,129**	**10**	**1,312,722**	**4**	**1,405,741**
Connecticut								
Alexion Pharmaceuticals, Inc.	1	93,760	1	93,760	0	0	0	0
Electro Energy, Inc.	1	100,000	1	100,000	0	0	0	0

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
Connecticut (continued)								
Genaissance Pharmaceuticals, Inc.	1	394,591	1	394,591	0	0	0	0
Hartford Hospital	1	364,278	0	0	0	0	1	364,278
John B. Pierce Laboratory, Inc.	6	1,218,676	6	1,218,676	0	0	0	0
Symbiotech, Inc.	1	396,331	1	396,331	0	0	0	0
University of Connecticut Health Center	5	1,075,684	5	1,075,684	0	0	0	0
University of Connecticut, Storrs	1	116,692	1	116,692	0	0	0	0
U.S. Nanocorp, Inc.	1	97,737	1	97,737	0	0	0	0
Yale University	55	14,481,549	45	11,892,170	9	955,598	1	1,633,781
Total, Connecticut	**73**	**18,339,298**	**62**	**15,385,641**	**9**	**955,598**	**2**	**1,998,059**
Delaware								
Compact Membrane Systems, Inc.	2	758,352	2	758,352	0	0	0	0
University of Delaware	1	162,701	1	162,701	0	0	0	0
Total, Delaware	**3**	**921,053**	**3**	**921,053**	**0**	**0**	**0**	**0**
District of Columbia								
American National Red Cross	16	4,666,696	15	4,501,057	1	165,639	0	0
Children's National Medical Center	1	306,297	1	306,297	0	0	0	0
Children's Research Institute	1	467,268	1	467,268	0	0	0	0
George Washington University	3	3,776,940	1	248,507	0	0	2	3,528,433
Georgetown University	20	4,362,255	16	3,953,244	1	25,420	3	383,591
Howard University	3	1,118,754	2	1,007,875	1	110,879	0	0
Medlantic Research Institute	2	1,607,461	1	1,180,481	0	0	1	426,980
Millennium Health	1	100,000	1	100,000	0	0	0	0
Ogilvy Adams and Rinehart	1	1,216,345	0	0	0	0	1	1,216,345
Total, District of Columbia	**48**	**17,622,016**	**38**	**11,764,729**	**3**	**301,938**	**7**	**5,555,349**
Florida								
Bethune-Cookman College	0	159,255	0	159,255	0	0	0	0
Better Control Medical Computers	1	99,997	1	99,997	0	0	0	0
Florida Agricultural and Mechanical University	0	261,649	0	255,842	0	5,807	0	0
Morphogenesis, Inc.	1	98,770	1	98,770	0	0	0	0
Mt. Sinai Medical Center, Miami Beach	2	1,508,726	2	1,508,726	0	0	0	0
Nanoptics, Inc.	1	99,511	1	99,511	0	0	0	0
Schwartz Electro-Optics, Inc.	1	407,796	1	407,796	0	0	0	0
University of Florida	21	5,150,817	19	5,045,939	2	104,878	0	0
University of Miami	12	2,297,446	11	2,037,509	1	259,937	0	0
University of Miami, Coral Gables	4	2,420,312	2	1,847,184	1	221,121	1	352,007
University of South Florida	3	398,997	3	398,997	0	0	0	0
Venn Nova, Inc.	1	98,520	1	98,520	0	0	0	0
Total, Florida	**47**	**13,001,796**	**42**	**12,058,046**	**4**	**591,743**	**1**	**352,007**

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
Georgia								
Cryolife, Inc.	2	343,755	2	343,755	0	0	0	0
Emory University	38	9,221,818	32	8,771,227	6	450,591	0	0
Georgia Institute of Technology	3	534,418	3	534,418	0	0	0	0
Georgia Southern University	1	32,500	0	0	1	32,500	0	0
Georgia State University	1	192,100	1	192,100	0	0	0	0
Medical College of Georgia	14	5,918,517	13	5,905,021	1	13,496	0	0
Morehouse School of Medicine	1	424,267	1	424,267	0	0	0	0
Savannah State College	1	62,713	1	62,713	0	0	0	0
Simutech	1	99,700	1	99,700	0	0	0	0
University of Georgia	2	391,114	2	391,114	0	0	0	0
Total, Georgia	**64**	**17,220,902**	**56**	**16,724,315**	**8**	**496,587**	**0**	**0**
Hawaii								
Kuakini Medical Center	2	633,432	1	379,432	0	0	1	254,000
University of Hawaii at Manoa	3	713,735	3	713,735	0	0	0	0
Total, Hawaii	**5**	**1,347,167**	**4**	**1,093,167**	**0**	**0**	**1**	**254,000**
Illinois								
American Dental Association Health Foundation	1	234,410	1	234,410	0	0	0	0
Critical Concepts, Inc.	1	99,999	1	99,999	0	0	0	0
Finch University of Health Science/Chicago Medical School	2	574,079	2	574,079	0	0	0	0
Humana Hospital-Michael Reese	3	455,932	2	425,032	1	30,900	0	0
Loyola University Medical Center	22	4,109,876	20	4,045,976	2	63,900	0	0
Magnetic Resonance Microsensors Corporation	1	401,492	1	401,492	0	0	0	0
Northwestern University, Evanston	17	3,984,032	17	3,984,032	0	0	0	0
Northwestern University, Chicago	6	1,475,846	6	1,475,846	0	0	0	0
Rush-Presbyterian-St. Luke's Medical Center	6	1,592,987	5	1,115,272	0	0	1	477,715
Southern Illinois University School of Medicine	3	389,893	3	389,893	0	0	0	0
Thermogen, Inc.	1	368,288	1	368,288	0	0	0	0
University of Chicago	36	12,571,579	31	11,296,616	5	1,274,963	0	0
University of Illinois at Chicago	31	6,943,833	26	6,288,145	5	655,688	0	0
University of Illinois at Urbana-Champaign	6	1,304,639	6	1,304,639	0	0	0	0
Total, Illinois	**136**	**34,506,885**	**122**	**32,003,719**	**13**	**2,025,451**	**1**	**477,715**
Indiana								
Indiana University/Purdue University at Indianapolis	46	12,909,451	41	12,484,938	4	415,931	1	8,582

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
Indiana (continued)								
Indiana University at Bloomington	3	713,866	3	713,866	0	0	0	0
Methodist Research Institute	1	23,140	0	0	1	23,140	0	0
Micronix	1	308,695	1	308,695	0	0	0	0
Purdue University, West Lafayette	5	608,491	4	578,891	1	29,600	0	0
University of Notre Dame	2	673,227	2	673,227	0	0	0	0
Total, Indiana	**58**	**15,236,870**	**51**	**14,759,617**	**6**	**468,671**	**1**	**8,582**
Iowa								
Maharishi University of Management	2	709,123	2	709,123	0	0	0	0
University of Iowa	55	18,070,581	43	16,389,142	11	1,418,756	1	262,683
Total, Iowa	**57**	**18,779,704**	**45**	**17,098,265**	**11**	**1,418,756**	**1**	**262,683**
Kansas								
Kansas State University	5	507,552	4	475,352	1	32,200	0	0
University of Kansas Medical Center	2	328,705	2	328,705	0	0	0	0
Total, Kansas	**7**	**836,257**	**6**	**804,057**	**1**	**32,200**	**0**	**0**
Kentucky								
University of Kentucky	18	3,648,476	17	3,465,810	0	0	1	182,666
University of Louisville	7	1,062,983	6	1,045,438	1	17,545	0	0
Total, Kentucky	**25**	**4,711,459**	**23**	**4,511,248**	**1**	**17,545**	**1**	**182,666**
Louisiana								
Louisiana State University Medical Center, New Orleans	9	1,444,271	9	1,444,271	0	0	0	0
Louisiana State University Medical Center, Shreveport	4	585,916	4	585,916	0	0	0	0
Pennington Biomedical Research Center	3	359,014	2	323,714	1	35,300	0	0
Tulane University of Louisiana	19	3,859,036	16	3,763,057	3	95,979	0	0
Total, Louisiana	**35**	**6,248,237**	**31**	**6,116,958**	**4**	**131,279**	**0**	**0**
Maine								
Jackson Laboratory	7	1,658,006	7	1,658,006	0	0	0	0
Maine Medical Center	1	29,600	0	0	1	29,600	0	0
Sea Run Holdings, Inc.	1	97,788	1	97,788	0	0	0	0
Sensor Research and Development Corporation	1	393,304	1	393,304	0	0	0	0
University of New England	1	181,323	1	181,323	0	0	0	0
Total, Maine	**11**	**2,360,021**	**10**	**2,330,421**	**1**	**29,600**	**0**	**0**
Maryland								
American Type Culture Collection	1	152,761	0	0	0	0	1	152,761
Biotech Research Laboratories (BTRL)	1	379,320	1	379,320	0	0	0	0

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
Maryland (continued)								
Cardiologic Systems, Inc.	1	100,000	1	100,000	0	0	0	0
Clinical Trials and Surveys Corporation	1	141,015	0	0	0	0	1	141,015
Compact Disc, Inc.	1	463,165	1	463,165	0	0	0	0
Defense Research Technologies, Inc.	1	359,924	1	359,924	0	0	0	0
DVP, Inc.	1	361,512	1	361,512	0	0	0	0
Emmes Corporation	2	500,085	0	0	0	0	2	500,085
Federation of American Societies for Experimental Biology	1	18,000	1	18,000	0	0	0	0
Henry M. Jackson Foundation for the Advancement of Military Medicine	3	1,064,845	3	1,064,845	0	0	0	0
Infrared Fiber Systems, Inc.	1	99,938	1	99,938	0	0	0	0
Institute for Genomic Research	1	517,256	1	517,256	0	0	0	0
Johns Hopkins University	116	37,964,121	93	29,179,975	15	2,459,371	8	6,324,775
Maryland Biotechnology Institute	1	298,750	1	298,750	0	0	0	0
Maryland Medical Research Institute	3	1,643,696	2	1,171,581	0	0	1	472,115
Ogden Bioservices Corporation	1	872,270	0	0	0	0	1	872,270
Peace Technology, Inc.	1	1,393,160	0	0	0	0	1	1,393,160
Prospect Associates, Ltd.	1	469,300	0	0	0	0	1	469,300
Quality Biological, Inc.	1	367,492	1	367,492	0	0	0	0
ROW Sciences, Inc.	1	4,256,706	0	0	0	0	1	4,256,706
Sinai Hospital of Baltimore	1	78,678	1	78,678	0	0	0	0
U.S. PHS Public Advisory Groups	2	2,615,000	2	2,615,000	0	0	0	0
University of Maryland Baltimore Professional School	30	7,940,712	25	7,470,224	3	147,674	2	322,814
Westat, Inc.	2	2,227,332	1	432,232	0	0	1	1,795,100
Total, Maryland	**175**	**64,285,038**	**137**	**44,977,892**	**18**	**2,607,045**	**20**	**16,700,101**
Massachusetts								
Abiomed, Inc.	4	1,719,803	3	552,729	0	0	1	1,167,074
Beth Israel Deaconess Medical Center	43	12,516,300	38	11,855,970	4	310,232	1	350,098
Biopure Corporation	1	99,762	1	99,762	0	0	0	0
Boston Biomedical Research Institute	4	1,043,365	4	1,043,365	0	0	0	0
Boston Biotechnology Corporation	1	29,900	0	0	1	29,900	0	
Boston Health and Hospitals Department	1	97,237	1	97,237	0	0	0	0
Boston Medical Center	7	4,328,366	7	4,328,366	0	0	0	0
Boston University	55	19,859,641	47	18,146,179	8	1,713,462	0	0
Boston University Medical Center Hospital	4	884,482	4	884,482	0	0	0	0
Brandeis University	3	868,156	3	868,156	0	0	0	0

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
Massachusetts (continued)								
Brigham and Women's Hospital	101	35,978,805	81	33,332,332	18	2,107,145	2	539,328
Cardiotech International, Inc. .	2	652,898	2	652,898	0	0	0	0
Center for Blood Research	11	8,297,700	9	8,232,800	2	64,900	0	0
Children's Hospital, Boston...	37	9,876,498	30	9,295,486	7	581,012	0	0
Covalent Associates, Inc.	1	100,000	1	100,000	0	0	0	0
Cypress Bioscience, Inc.	1	325,727	1	325,727	0	0	0	0
Dana-Farber Cancer Institute..	14	2,515,374	13	2,498,619	0	0	1	16,755
E. Benson Hood Laboratories, Inc.	1	381,232	1	381,232	0	0	0	0
Egan Design Services	1	99,979	1	99,979	0	0	0	0
Engineering Partnership, Ltd..	1	379,821	1	379,821	0	0	0	0
Foster-Miller, Inc.	1	413,270	1	413,270	0	0	0	0
Giner, Inc.	1	373,694	1	373,694	0	0	0	0
Gwathmey, Inc.	0	15,470	0	15,470	0	0	0	0
Harvard University.....	43	12,094,033	34	10,771,551	9	1,322,482	0	0
Implant Sciences Corporation .	1	99,915	1	99,915	0	0	0	0
Innovative Chemical and Environmental Technology ..	1	365,233	1	365,233	0	0	0	0
Intraimmune Therapies, Inc. ..	1	99,994	1	99,994	0	0	0	0
ION Optics, Inc.	1	99,948	1	99,948	0	0	0	0
Mallory Institute of Pathology.	1	307,846	1	307,846	0	0	0	0
Massachusetts General Hospital	55	13,753,436	48	12,087,095	6	309,027	1	1,357,314
Massachusetts Institute of Technology	8	3,911,004	6	3,855,984	2	55,020	0	0
Mosaic Technologies, Inc.	1	66,750	1	66,750	0	0	0	0
New England Medical Center	22	5,815,417	19	5,361,454	3	453,963	0	0
New England Research Institutes, Inc.....	7	2,937,776	6	2,560,164	0	0	1	377,612
Northeastern University.....	1	182,962	1	182,962	0	0	0	0
One Cell Systems, Inc.	1	429,042	1	429,042	0	0	0	0
Pharm-Eco Laboratories.....	1	99,953	1	99,953	0	0	0	0
Polestar Technologies, Inc. ...	1	99,830	1	99,830	0	0	0	0
Radiation Monitoring Devices, Inc.	1	371,575	1	371,575	0	0	0	0
Rare Earth Medical, Inc.	1	380,475	1	380,475	0	0	0	0
Science Research Laboratory, Inc.	1	99,981	1	99,981	0	0	0	0
St. Elizabeth's Medical Center of Boston.....	8	1,517,874	8	1,517,874	0	0	0	0
T Cell Sciences, Inc.	2	473,215	2	473,215	0	0	0	0
Thermal Technologies, Inc.	1	99,971	1	99,971	0	0	0	0
Tufts University, Boston	9	1,973,359	7	1,899,177	2	74,182	0	0
University of Massachusetts, Lowell	1	166,997	1	166,997	0	0	0	0
University of Massachusetts Medical School	15	6,696,313	14	6,584,028	1	112,285	0	0
Visus Pharmaceuticals, Inc.	1	97,723	1	97,723	0	0	0	0
Warren E. Collins, Inc.	2	298,229	2	298,229	0	0	0	0
Whalen Biomedical, Inc.	1	1,794,807	0	0	0	0	1	1,794,807

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
Massachusetts (continued)								
Whitehead Institute for Biomedical Research	1	394,174	1	394,174	0	0	0	0
Worcester Polytechnic Institute	1	100,656	1	100,656	0	0	0	0
Total, Massachusetts	**485**	**155,685,968**	**414**	**142,949,370**	**63**	**7,133,610**	**8**	**5,602,988**
Michigan								
Case Western Reserve University, Henry Ford Health Science Center	8	3,122,400	7	2,955,532	0	0	1	166,868
Michigan Critical Care Consultants, Inc.	2	518,171	2	518,171	0	0	0	0
Michigan State University	7	1,288,487	7	1,288,487	0	0	0	0
Parke Davis Pharmaceutical Research Division	1	111,927	1	111,927	0	0	0	0
Sentec Corporation	0	169,166	0	169,166	0	0	0	0
Thromgen, Inc.	1	367,995	1	367,995	0	0	0	0
University of Michigan at Ann Arbor	86	24,338,802	73	22,387,754	10	935,517	3	1,015,531
Wayne State University	18	3,542,226	17	3,516,312	1	25,914	0	0
Western Michigan University	1	129,172	1	129,172	0	0	0	0
Total, Michigan	**124**	**33,588,346**	**109**	**31,444,516**	**11**	**961,431**	**4**	**1,182,399**
Minnesota								
BSI Corporation	3	874,750	3	874,750	0	0	0	0
Data Sciences International, Inc.	1	492,089	1	492,089	0	0	0	0
Mayo Foundation	31	6,586,610	25	6,197,306	5	318,294	1	71,010
St. Olaf College	1	134,930	1	134,930	0	0	0	0
University of Minnesota, Twin Cities	62	20,365,643	53	17,197,455	5	655,116	4	2,513,072
Total, Minnesota	**98**	**28,454,022**	**83**	**24,896,530**	**10**	**973,410**	**5**	**2,584,082**
Mississippi								
Jackson State University	1	156,433	0	0	1	156,433	0	0
University of Mississippi Medical Center	12	3,521,847	8	2,366,098	3	85,220	1	1,070,529
Total, Mississippi	**13**	**3,678,280**	**8**	**2,366,098**	**4**	**241,653**	**1**	**1,070,529**
Missouri								
Barnes-Jewish Hospital	14	13,714,353	12	3,649,153	2	65,200	0	0
Children's Mercy Hospital, Kansas City	1	195,928	1	195,928	0	0	0	0
Reliable Biopharmaceutical Corporation	1	319,826	1	319,826	0	0	0	0
St. Louis University	19	3,465,126	18	3,384,528	0	0	1	80,598
University of Missouri, Columbia	21	4,249,705	18	4,036,090	3	213,615	0	0
University of Missouri, Kansas City	3	397,229	3	397,229	0	0	0	0
Washington University	91	24,583,167	75	21,051,101	13	1,770,320	3	1,761,746
Total, Missouri	**150**	**36,925,334**	**128**	**33,033,855**	**18**	**2,049,135**	**4**	**1,842,344**

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
Montana								
McLaughlin Research Institute for Biomedical Sciences	1	355,593	1	355,593	0	0	0	0
Montana State University, Bozeman	0	14,914	0	14,914	0	0	0	0
Yellowstone Environmental Science	1	401,298	1	401,298	0	0	0	0
Total, Montana	**2**	**771,805**	**2**	**771,805**	**0**	**0**	**0**	**0**
Nebraska								
Creighton University	2	141,127	1	102,256	1	38,871	0	0
University of Nebraska, Lincoln	1	208,910	1	208,910	0	0	0	0
University of Nebraska Medical Center	10	1,797,021	10	1,797,021	0	0	0	0
Total, Nebraska	**13**	**2,147,058**	**12**	**2,108,187**	**1**	**38,871**	**0**	**0**
Nevada								
Sierra Biomedical Research Corporation	2	636,933	2	636,933	0	0	0	0
University of Nevada at Reno	7	1,540,445	7	1,540,445	0	0	0	0
Total, Nevada	**9**	**2,177,378**	**9**	**2,177,378**	**0**	**0**	**0**	**0**
New Hampshire								
Creare, Inc.	5	484,771	5	484,771	0	0	0	0
Dartmouth College	14	2,711,460	11	2,495,723	3	215,737	0	0
Diatide, Inc.	1	250,261	1	250,261	0	0	0	0
Optix, Inc.	1	284,648	1	284,648	0	0	0	0
Total, New Hampshire	**21**	**3,731,140**	**18**	**3,515,403**	**3**	**215,737**	**0**	**0**
New Jersey								
Continuum Dynamics, Inc.	1	99,373	1	99,373	0	0	0	0
Princeton University	2	297,882	1	269,282	1	28,600	0	0
Rutgers State University, Newark	0	72,004	0	72,004	0	0	0	0
University of Medicine and Dentistry of New Jersey-R.W. Johnson Medical School	8	1,469,889	7	1,444,469	1	25,420	0	0
University of Medicine and Dentistry of New Jersey-School of Osteopathic Medicine	2	285,917	2	285,917	0	0	0	0
University of Medicine and Dentistry of New Jersey	11	1,998,616	10	1,979,226	0	0	1	19,390
Veritas Medical Technologies, Inc.	1	100,000	1	100,000	0	0	0	0
Total, New Jersey	**25**	**4,323,681**	**22**	**4,250,271**	**2**	**54,020**	**1**	**19,390**
New Mexico								
Lovelace Respiratory Research Institute	1	117,445	1	117,445	0	0	0	0
New Mexico Highlands University	0	99,172	0	99,172	0	0	0	0

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
New Mexico (continued)								
New Mexico State University, Las Cruces	0	132,663	0	132,663	0	0	0	0
University of New Mexico, Albuquerque	13	3,728,752	8	3,142,797	4	175,580	1	410,375
Total, New Mexico	**14**	**4,078,032**	**9**	**3,492,077**	**4**	**175,580**	**1**	**410,375**
New York								
Aaron Diamond AIDS Research Center	1	330,000	1	330,000	0	0	0	0
Albany Medical College of Union University	7	1,009,455	5	687,938	2	321,517	0	0
American Health Foundation	1	726,678	1	726,678	0	0	0	0
Anatole J. Sipin Company, Inc.	1	266,815	1	266,815	0	0	0	0
Central New York Research Corporation	1	214,606	1	214,606	0	0	0	0
Circulatory Technology, Inc.	1	472,332	1	472,332	0	0	0	0
City College of New York	1	298,728	1	298,728	0	0	0	0
Columbia Laboratories	1	99,370	1	99,370	0	0	0	0
Columbia University, New York	59	23,670,685	53	23,090,369	5	503,615	1	76,701
Conversion Energy Enterprises	1	97,590	1	97,590	0	0	0	0
Cornell University, Ithaca	3	660,301	2	640,865	1	19,436	0	0
Cornell University Medical Center	39	15,874,936	35	15,412,072	4	462,864	0	0
Health Science Center at Brooklyn	4	929,564	4	929,564	0	0	0	0
Health Science Center at Syracuse	5	2,143,778	5	2,143,778	0	0	0	0
Herbert H. Lehman College	0	88,938	0	88,938	0	0	0	0
Hunter College	0	17,616	0	17,616	0	0	0	0
Hypres, Inc.	1	431,957	1	431,957	0	0	0	0
Institute for Basic Research in Developmental Disabilities	1	237,844	1	237,844	0	0	0	0
Interfaith Medical Center, Brooklyn	1	205,085	0	0	0	0	1	205,085
Lifelink Monitoring, Inc.	1	100,000	1	100,000	0	0	0	0
Masonic Medical Research Laboratory, Inc.	1	448,331	1	448,331	0	0	0	0
Montefiore Medical Center, Bronx	3	2,473,128	3	2,473,128	0	0	0	0
Mount Sinai School of Medicine of CUNY	19	5,758,377	14	4,886,995	3	300,436	2	570,946
Narrows Institute for Biomedical Research, Inc.	1	146,041	1	146,041	0	0	0	0
New York Academy of Sciences	1	15,000	1	15,000	0	0	0	0
New York Blood Center	6	2,256,335	6	2,256,335	0	0	0	0
New York Medical College	17	6,353,841	17	6,353,841	0	0	0	0
New York University Medical Center	18	4,288,648	16	4,064,586	2	224,062	0	0
North Shore University Hospital	2	383,575	2	383,575	0	0	0	0

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
New York (continued)								
Public Health Research Institute of the City of New York	2	573,709	2	573,709	0	0	0	0
Queens College	1	226,475	1	226,475	0	0	0	0
Rockefeller University	6	3,492,313	6	3,492,313	0	0	0	0
Roswell Park Cancer Institute	3	746,081	3	746,081	0	0	0	0
Sloan-Kettering Institute for Cancer Research	8	1,910,717	7	1,825,685	0	0	1	85,032
St. Luke's-Roosevelt Institute for Health Sciences	5	1,584,394	5	1,584,394	0	0	0	0
State University of New York at Stony Brook	16	3,288,493	16	3,288,493	0	0	0	0
State University of New York at Albany	1	179,734	1	179,734	0	0	0	0
State University of New York at Buffalo	10	1,929,253	9	1,846,460	1	82,793	0	0
Syracuse University at Syracuse	1	467,950	1	467,950	0	0	0	0
Trudeau Institute, Inc.	1	333,164	1	333,164	0	0	0	0
University of Rochester	30	10,172,857	28	9,858,243	2	314,614	0	0
Winthrop-University Hospital	1	81,700	1	81,700	0	0	0	0
Yeshiva University	19	8,286,924	16	7,947,774	3	339,150	0	0
Total, New York	**301**	**103,273,318**	**273**	**99,767,067**	**23**	**2,568,487**	**5**	**937,764**
North Carolina								
Biotherm, Inc.	1	208,616	1	208,616	0	0	0	0
Data Spectrum Corporation	1	99,500	1	99,500	0	0	0	0
Duke University	105	31,388,020	89	26,464,789	10	1,016,279	6	3,906,952
East Carolina University	3	440,555	3	440,555	0	0	0	0
Epigenesis Pharmaceuticals, Inc.	1	99,992	1	99,992	0	0	0	0
Gene Tec Corporation	1	99,993	1	99,993	0	0	0	0
Magnetic Imaging Technologies, Inc.	1	99,896	1	99,896	0	0	0	0
Molichem-Magellan	1	71,500	1	71,500	0	0	0	0
North Carolina Agricultural and Technological State University	0	129,520	0	129,520	0	0	0	0
North Carolina State University at Raleigh	5	713,100	3	651,000	2	62,100	0	0
University of North Carolina at Chapel Hill	67	27,439,654	55	19,489,098	7	1,076,739	5	6,873,817
Wake Forest University	40	15,475,814	34	13,092,662	3	503,165	3	1,879,987
Total, North Carolina	**226**	**76,266,160**	**190**	**60,947,121**	**22**	**2,658,283**	**14**	**12,660,756**
North Dakota								
University of North Dakota	0	75,360	0	75,360	0	0	0	0
Total, North Dakota	**0**	**75,360**	**0**	**75,360**	**0**	**0**	**0**	**0**
Ohio								
Anatrace, Inc.	1	396,968	1	396,968	0	0	0	0
Case Western Reserve University	61	17,561,271	52	16,542,301	8	979,726	1	39,244
Children's Hospital, Columbus	1	81,039	1	81,039	0	0	0	0

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
Ohio (continued)								
Children's Hospital Medical Center, Cincinnati	24	6,862,629	22	6,662,190	2	200,439	0	0
Cleveland Clinic Foundation	36	9,289,716	31	7,877,988	2	61,100	3	1,350,628
Enable Medical Corporation	2	200,000	2	200,000	0	0	0	0
Inotek Corporation	2	192,921	2	192,921	0	0	0	0
Isolab, Inc.	1	213,108	1	213,108	0	0	0	0
Medical College of Ohio at Toledo	3	676,640	3	676,640	0	0	0	0
Nextech Materials, Ltd.	1	97,986	1	97,986	0	0	0	0
Northeastern Ohio University College of Medicine	4	378,241	3	347,041	1	31,200	0	0
Ohio State University	22	4,724,239	19	4,505,221	1	28,600	2	190,418
Technology Solutions Group, Ltd.	1	99,797	1	99,797	0	0	0	0
University of Akron	1	258,129	1	258,129	0	0	0	0
University of Cincinnati	43	12,847,632	36	12,253,327	6	545,088	1	49,217
University of Toledo	1	261,046	1	261,046	0	0	0	0
Wright State University	6	843,082	5	784,775	1	58,307	0	0
Total, Ohio	**210**	**54,984,444**	**182**	**51,450,477**	**21**	**1,904,460**	**7**	**1,629,507**
Oklahoma								
Oklahoma Medical Research Foundation	4	1,894,693	4	1,894,693	0	0	0	0
University of Oklahoma Health Sciences Center	14	5,143,083	12	4,966,819	2	176,264	0	0
University of Oklahoma, Norman	1	96,498	1	96,498	0	0	0	0
Total, Oklahoma	**19**	**7,134,274**	**17**	**6,958,010**	**2**	**176,264**	**0**	**0**
Oregon								
Electrical Geodesics, Inc.	1	95,030	1	95,030	0	0	0	0
Oregon Center for Applied Science	2	731,514	2	731,514	0	0	0	0
Oregon Graduate Institute of Science and Technology	1	178,855	1	178,855	0	0	0	0
Oregon Health Sciences University	23	5,273,084	19	4,709,452	4	563,632	0	0
Oregon Medical Systems, Inc.	1	99,941	1	99,941	0	0	0	0
Oregon Regional Primate Research Center	2	503,699	2	503,699	0	0	0	0
Oregon Research Institute	1	430,503	1	430,503	0	0	0	0
Oregon State University	3	813,305	3	813,305	0	0	0	0
University of Oregon	2	522,028	2	522,028	0	0	0	0
Total, Oregon	**36**	**8,647,959**	**32**	**8,084,327**	**4**	**563,632**	**0**	**0**
Pennsylvania								
Allegheny University of Health Sciences	21	4,932,090	19	4,701,513	2	230,577	0	0
Allegheny-Singer Research Institute	1	28,146	0	0	0	0	1	28,146
C and L Instruments, Inc.	1	307,876	1	307,876	0	0	0	0
Carnegie-Mellon University	6	1,452,854	5	1,427,434	1	25,420	0	0

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
Pennsylvania (continued)								
Children's Hospital of Philadelphia	20	9,587,596	17	9,453,955	3	133,641	0	0
Children's Hospital of Pittsburgh	3	600,606	3	600,606	0	0	0	0
Drexel University	2	341,344	2	341,344	0	0	0	0
Fox Chase Cancer Center	2	316,934	2	316,934	0	0	0	0
Geisinger Foundation	1	384,242	0	0	0	0	1	384,242
Graduate Hospital, Philadelphia	4	867,368	4	867,368	0	0	0	0
Institute for Cancer Research	2	454,804	2	454,804	0	0	0	0
KDL Medical Technologies, Inc.	1	348,325	1	348,325	0	0	0	0
Magee-Women's Hospital	2	389,409	2	389,409	0	0	0	0
NIM, Inc.	1	351,483	1	351,483	0	0	0	0
Pennsylvania State University, Hershey Medical Center	22	5,627,915	20	4,834,948	0	19,065	2	773,902
Pennsylvania State University, University Park	10	1,664,799	9	1,640,507	1	24,292	0	0
Philadelphia College of Pharmacy and Science	1	88,150	1	88,150	0	0	0	0
QDOT Corporation	1	99,996	1	99,996	0	0	0	0
Temple University	17	4,142,304	13	3,692,666	3	370,703	1	78,935
Thomas Jefferson University	18	4,227,077	15	3,890,104	3	336,973	0	0
Transicoil, Inc.	1	1,620,966	0	0	0	0	1	1,620,966
University City Science Center	2	393,812	2	393,812	0	0	0	0
University of Pennsylvania	99	27,960,554	85	25,472,450	11	1,848,060	3	640,044
University of Pittsburgh at Pittsburgh	53	13,785,417	42	11,529,515	7	957,029	1	1,298,873
Weis Center for Research-Geisinger Clinic	3	424,758	2	419,403	1	5,355	0	0
Wistar Institute of Anatomy and Biology	2	339,751	2	339,751	0	0	0	0
Total, Pennsylvania	**296**	**80,738,576**	**251**	**71,962,353**	**32**	**3,951,115**	**13**	**4,825,108**
Rhode Island								
Brown University	2	190,719	1	150,547	1	40,172	0	0
Gordon Research Conferences	4	48,730	4	48,730	0	0	0	0
Memorial Hospital of Rhode Island	3	751,376	2	721,554	1	29,822	0	0
Miriam Hospital	2	318,877	1	290,026	0	0	1	28,851
Rhode Island Hospital, Providence	4	1,031,133	4	1,031,133	0	0	0	0
Total, Rhode Island	**15**	**2,340,835**	**12**	**2,241,990**	**2**	**69,994**	**1**	**28,851**
South Carolina								
Clemson University	1	174,344	1	174,344	0	0	0	0
Medical University of South Carolina	26	6,957,432	22	6,347,173	3	425,116	1	185,143

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
South Carolina (continued)								
Richland Memorial Hospital, Columbia	1	245,011	1	245,011	0	0	0	0
University of South Carolina at Columbia	4	1,365,924	4	1,365,924	0	0	0	0
Total, South Carolina	**32**	**8,742,711**	**28**	**8,132,452**	**3**	**425,116**	**1**	**185,143**
South Dakota								
U.S. PHS Aberdeen Area Indian Health Service	1	634,843	1	634,843	0	0	0	0
University of South Dakota	2	198,496	2	198,496	0	0	0	0
Total, South Dakota	**3**	**833,339**	**3**	**833,339**	**0**	**0**	**0**	**0**
Tennessee								
East Tennessee State University	4	742,367	4	742,367	0	0	0	0
Meharry Medical College	15	2,284,261	9	1,815,095	6	469,166	0	0
Oak Ridge Associated Universities	1	276,569	1	276,569	0	0	0	0
St. Jude Children's Research Hospital	4	1,671,772	1	1,671,772	0	0	0	0
University of Memphis	5	1,522,882	4	1,498,462	1	24,420	0	0
University of Tennessee at Memphis	16	2,992,155	12	2,505,328	3	276,760	1	210,067
University of Tennessee at Knoxville	1	35,300	0	0	1	35,300	0	0
Vanderbilt University	62	14,246,201	51	12,525,327	10	1,479,469	1	241,405
Total, Tennessee	**108**	**23,771,507**	**85**	**21,034,920**	**21**	**2,285,115**	**2**	**451,472**
Texas								
Baylor College of Medicine	49	15,656,218	39	14,243,786	7	614,849	3	797,583
Biochemix, Inc.	1	100,000	1	100,000	0	0	0	0
Biomedical Development Corporation	1	100,000	1	100,000	0	0	0	0
Cooper Institute for Aerobics Research	2	1,137,445	1	635,863	0	0	1	501,582
Genemedicine, Inc.	1	100,000	1	100,000	0	0	0	0
Indus Instruments	1	362,928	1	362,928	0	0	0	0
Microbiomed Corporation	1	99,997	1	99,997	0	0	0	0
Microfab Technologies, Inc.	1	99,433	1	99,433	0	0	0	0
Prairie View Agriculture and Mechanical University	0	155,671	0	155,671	0	0	0	0
Proportional Technologies, Inc.	2	321,546	2	321,546	0	0	0	0
Rice University	6	1,161,370	5	1,130,170	1	31,200	0	0
Southwest Foundation for Biomedical Research	8	8,453,753	7	6,707,686	0	0	1	1,746,067
Texas A&M University Health Science Center	5	860,955	5	860,955	0	0	0	0
Texas Engineering Experiment Station	6	715,897	6	715,897	0	0	0	0
Texas Heart Institute	1	243,569	1	243,569	0	0	0	0
Texas Southern University	1	164,403	1	164,403	0	0	0	0

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
Texas (continued)								
Texas Technical University Health Sciences Center	3	293,645	3	293,645	0	0	0	0
U.S. Air Force Armstrong Laboratory	1	162,536	1	162,536	0	0	0	0
University of North Texas Health Science Center	7	934,148	6	887,853	1	46,295	0	0
University of Texas at Austin	3	550,974	3	550,974	0	0	0	0
University of Texas at Dallas	1	235,321	1	235,321	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	3	233,970	3	233,970	0	0	0	0
University of Texas Health Science Center, Houston	22	22,407,792	17	5,338,984	2	132,931	3	16,935,877
University of Texas Health Science Center, San Antonio	19	3,217,074	14	3,020,790	5	196,284	0	0
University of Texas M.D. Anderson Cancer Center	2	428,904	2	428,904	0	0	0	0
University of Texas Medical Branch at Galveston	17	3,259,048	16	3,219,626	0	0	1	39,422
University of Texas at San Antonio	1	77,895	1	77,895	0	0	0	0
University of Texas Southwest Medical Center at Dallas	35	14,430,089	33	14,057,690	2	372,399	0	0
Total, Texas	**201**	**75,978,077**	**173**	**54,550,092**	**19**	**1,407,454**	**9**	**20,020,531**
Utah								
Brigham Young University	2	360,919	2	360,919	0	0	0	0
Latter Day Saints Hospital	2	569,682	1	214,691	0	0	1	354,991
Medquest Products, Inc.	1	99,773	1	99,773	0	0	0	0
University of Utah	57	14,307,325	51	13,926,842	6	380,483	0	0
Total, Utah	**62**	**15,337,699**	**55**	**14,602,225**	**6**	**380,483**	**1**	**354,991**
Vermont								
University of Vermont and State Agricultural College	22	6,021,203	19	5,505,961	2	203,863	1	311,379
Total, Vermont	**22**	**6,021,203**	**19**	**5,505,961**	**2**	**203,863**	**1**	**311,379**
Virginia								
American Laboratory Supplies, Inc.	1	99,900	1	99,900	0	0	0	0
American Research Corporation of Virginia	1	304,123	1	304,123	0	0	0	0
Commonwealth Biotechnologies, Inc.	1	238,039	1	238,039	0	0	0	0
Eastern Virginia Medical School of the Medical College of Hampton Roads	4	637,931	4	637,931	0	0	0	0
Hampton University	0	10,800	0	0	0	10,800	0	0
Image Medical Communications	1	99,695	1	99,695	0	0	0	0
Planning Systems, Inc.	1	99,008	1	99,008	0	0	0	0
University of Virginia, Charlottesville	39	7,919,919	28	6,987,486	11	932,433	0	0

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
Virginia (continued)								
Virginia Commonwealth University	10	1,399,446	8	1,338,646	2	60,800	0	0
Total, Virginia	**58**	**10,808,861**	**45**	**9,804,828**	**13**	**1,004,033**	**0**	**0**
Washington								
A.S.T.H.M.A., Inc.	1	785,705	0	0	0	0	1	785,705
Barlow Scientific	2	392,011	2	392,011	0	0	0	0
Center for Health Studies	2	623,693	2	623,693	0	0	0	0
EKOS, LLC	1	99,130	1	99,130	0	0	0	0
Fred Hutchinson Cancer Research Center	10	4,550,872	9	4,532,012	0	0	1	18,860
Icogen	2	465,892	2	465,892	0	0	0	0
Neorx Corporation	1	95,839	1	95,839	0	0	0	0
Seattle-King County Public Health Department	1	410,223	1	410,223	0	0	0	0
Spencer Technologies	1	99,908	1	99,908	0	0	0	0
Statistics and Epidemiology Research Corporation	1	6,329,829	0	0	0	0	1	6,329,829
University of Washington	101	34,589,894	84	30,944,249	13	1,417,673	4	2,227,972
Washington State University	1	181,856	1	181,856	0	0	0	0
Total, Washington	**124**	**48,624,852**	**104**	**37,844,813**	**13**	**1,417,673**	**7**	**9,362,366**
West Virginia								
Marshall University	2	163,634	2	163,634	0	0	0	0
West Virginia University	6	920,737	6	920,737	0	0	0	0
Total, West Virginia	**8**	**1,084,371**	**8**	**1,084,371**	**0**	**0**	**0**	**0**
Wisconsin								
Advanced Medical Devices, Inc.	2	461,083	2	461,083	0	0	0	0
Blood Center of Southeastern Wisconsin	10	3,609,455	9	3,499,541	1	109,914	0	0
Marquette University	1	172,618	1	172,618	0	0	0	0
Marshfield Clinic	1	2,216,981	0	0	0	0	1	2,216,981
Medical College of Wisconsin	38	10,490,822	34	10,151,537	4	339,285	0	0
University of Wisconsin, Madison	47	11,749,826	43	11,316,805	3	238,676	1	194,345
Total, Wisconsin	**99**	**28,700,785**	**89**	**25,601,584**	**8**	**687,875**	**2**	**2,411,326**
Puerto Rico								
U.S. Department of Veterans Affairs Medical Center	1	58,378	1	58,378	0	0	0	0
University of Puerto Rico Medical Sciences	0	167,097	0	167,097	0	0	0	0
University of Puerto Rico, Rio Piedras	0	262,715	0	262,715	0	0	0	0
Total, Puerto Rico	**1**	**488,190**	**1**	**488,190**	**0**	**0**	**0**	**0**
Total, United States	**4,173**	**$1,256,071,940**	**3,562**	**$1,099,132,971**	**463**	**$48,832,480**	**148**	**$108,106,489**

Institution	Totals		Research Grants		Research Training and Development		Contracts	
	No.	Dol.	No.	Dol.	No.	Dol.	No.	Dol.
Canada								
Clinical Research Institute of Montreal	1	250,000	1	250,000	0	0	0	0
Hospital for Sick Children, Toronto	2	363,343	1	165,180	0	0	1	198,163
Laval University	1	663,536	1	663,536	0	0	0	0
McGill University	1	175,000	1	175,000	0	0	0	0
Montreal Heart Institute	1	110,069	1	110,069	0	0	0	0
University of Manitoba	1	124,662	1	124,662	0	0	0	0
University of Toronto	1	121,583	1	121,583	0	0	0	0
Total, Canada	**8**	**1,808,193**	**7**	**1,610,030**	**0**	**0**	**1**	**198,163**
United Kingdom								
University College, London	1	136,774	1	136,774	0	0	0	0
University of Warwick	1	100,000	1	100,000	0	0	0	0
Total, United Kingdom	**2**	**236,774**	**2**	**236,774**	**0**	**0**	**0**	**0**
Total, Other	**10**	**$2,044,967**	**9**	**$1,846,804**	**0**	**$0**	**1**	**$198,163**
Grand Total	4,183	$1,258,116,907	3,571	$1,100,979,775	463	$48,832,480	149	$108,304,652

Appendices

Types of Research Activity

List of Abbreviations

Index

Types of Research Activity

Research Projects

Research Project Grants (R01): To support discrete and specific projects to be performed by one or several investigators in areas of the investigator's particular interests and competencies.

Research Projects (Cooperative Agreements) (U01): To support discrete, circumscribed projects in areas of an investigator's specific interest and competency involving substantial programmatic participation by the NHLBI during performance of the activity.

Research Program Projects (P01): To support broadly based, multidisciplinary, often long-term research projects that have specific major objectives or basic themes directed toward a well-defined research program goal. Usually, a relatively large, organized group of researchers conducts individual subprojects, the results of which help achieve objectives of the program project.

Small Research Grants (R03): To provide limited support for extended analyses of research data generated by clinical trials, population research, and demonstration and education studies.

Academic Research Enhancement Awards (AREA) (R15): To support small-scale research projects conducted by faculty in primarily baccalaureate degree-granting domestic institutions. Awards are for up to $75,000 for direct costs (plus applicable indirect costs) for periods not to exceed 36 months.

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 based on 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 mulipurpose 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.

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)

Predoctoral Individual NRSA (F31): To provide predoctoral individuals with supervised research training in areas related to heart, lung, and blood diseases, blood resources, and sleep disorders leading toward the research degree (e.g., Ph.D.)

Postdoctoral Individual NRSA (F32): To provide postdoctoral research training to individuals to broaden their scientific background and extend their potential for research in areas related to heart, lung, and blood diseases and blood resources.

NRSA for Senior Fellows (F33): To provide experienced scientists with an opportunity to make major changes in the direction of their research careers, to broaden their scientific background, to acquire new research capabilities, to enlarge their command of an allied research field, or to take time from regular professional responsibilities for the purpose of broadening their research capabilities.

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

ICD	International Classification of Diseases; also, implantable cardiac defibrillator
IVAS	Innovative Ventricular Assist System
JNC V	The Fifth Report of the Joint National Committee on the Detection, Evaluation, and Treatment of High Blood Pressure
LRC	Lipid Research Clinics
MARC	Minority Access to Research Careers
MBRS	Minority Biomedical Research Support
MERIT	Method to Extend Research in Time
MI	myocardial infarction
MSH	Multicenter Study of Hydroxyurea in Sickle Cell Anemia
NAEPP	National Asthma Education and Prevention Program
NASA	National Aeronautics and Space Administration
NCEP	National Cholesterol Education Program
NCHS	National Center for Health Statistics
NCSDR	National Center on Sleep Disorders Research
NETT	National Emphysema Treatment Trial
NHAAP	National Heart Attack Alert Program
NHANES	National Health and Nutrition Examination Survey
NHBPEP	National High Blood Pressure Education Program
NHI	National Heart Institute
NHIS	National Health Interview Survey
NHLBAC	National Heart, Lung, and Blood Advisory Council
NHLBI	National Heart, Lung, and Blood Institute (formerly NHI and NHLI)
NHLI	National Heart and Lung Institute
NICHD	National Institute of Child Health and Human Development
NIDDK	National Institute of Diabetes and Digestive and Kidney Diseases
NIH	National Institutes of Health
NRSA	National Research Service Award
NSF	National Sleep Foundation
OD	Office of the Director
OEI	Obesity Education Initiative
OPEC	Office of Prevention, Education, and Control
ORMH	Office of Research on Minority Health
PA	Program Announcement
PATHWAYS	Obesity Prevention in American Indians
PEACE	Prevention of Events with Angiotensin Converting Enzyme Inhibitor Therapy
PEPI	Postmenopausal Estrogen/ Progestin Interventions
PHS	Public Health Service
R&D	research and development
REACT	Rapid Early Action for Coronary Treatment
REDS	Retrovirus Epidemiology Donor Study
RFA	Request for Applications
RFP	Request for Proposals
RMS	research management and support
RPG	research project grants
SBIR	Small Business Innovation Research
SCOR	Specialized Center(s) of Research
SEP	Special Emphasis Panel
SIDS	sudden infant death syndrome

STOP	Stroke Prevention in Sickle Cell Anemia
STTR	Small Business Technology Transfer
TB	tuberculosis
TOHP	Trials of Hypertension Prevention
VATS	Viral Activation Transfusion Study
WACS	Women's Antioxidant and Cardiovascular Study
WAVE	Women's Angiographic Vitamin and Estrogen Trial
WISE	Women's Ischemia Syndrome Evaluation
WHO	World Health Organization

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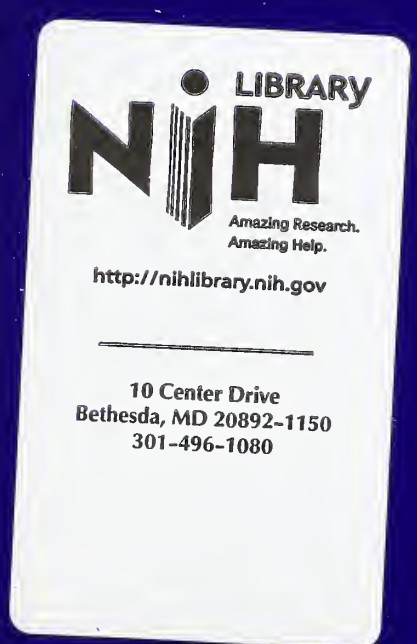

Discrimination Prohibited: Under provisions of applicable public laws enacted by Congress since 1964, no person in the United States shall, on the grounds of race, color, national origin, handicap, or age, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity (or, on the basis of sex, with respect to any education program or activity) receiving Federal financial assistance. In addition, Executive Order 11141 prohibits discrimination on the basis of age by contractors and subcontractors in the performance of Federal contracts, and Executive Order 11246 states that no federally funded contractor may discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. Therefore, the Heart, Lung, and Blood Institute must be operated in compliance with these laws and Executive Orders.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
National Institutes of Health