Fact Book

Fiscal Year

2001

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

Fact Book

Fiscal Year

2001

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For Administrative Use

National Institutes

of Health

National Heart, Lung,

and Blood Institute

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

Contents

Figures

Chapter 4. Disease Statistics

Chapter 7. Fiscal Year 2001 Budget Overview

Chapter 8. Long-Term Trends

Chapter 9. Research Grants

Chapter 10. Research and Development Contracts

Chapter 13. Research Training and Career Development Programs

Chapter 14. Geographic Distribution of Awards: Fiscal Year 2001

Tables

Chapter 2. Program Overivew

Chapter 4. Disease Statistics

Chapter 7. Fiscal Year 2001 Budget Overview

Chapter 8. Long-Term Trends

Chapter 9. Research Grants

Chapter 10. Research and Development Contracts

Chapter 11. Clinical Trials

Chapter 13. Research Training and Career Development Programs

Chapter 14. Geographic Distribution of Awards: Fiscal Year 2001

1. Directory of Personnel*

Office of the Director	Bldg.	Room	Phone	MSC†,‡
Director, **Claude Lenfant, M.D.**	31	5A52	496-5166	2486
Deputy Director, **Barbara Alving, 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
Special Assistant to the Director, **Lawrence Friedman, M.D.**	31	5A10	496-9899	2490
Associate Director for Administrative Management, **Donald P. Christoferson**	31	5A48	496-2411	2490
Associate Director for Scientific Program Operation, **Carl A. Roth, Ph.D., LL.M.**	31	5A03	496-6331	2482
Associate Director for Prevention, Education, and Control, **Gregory J. Morosco, Ph.D., M.P.H.**	31	4A03	496-5437	2480
Associate Director for International Programs, **Ruth J. Hegyeli, M.D.**	31	4A07	496-5375	2490
Office of Special Concerns Director, **Mishyelle I. Croom**	31	4A28	496-1763	2490
Office of Administrative Management				
Director/Executive Officer, **Donald P. Christoferson**	31	5A48	496-2411	2490
Special Assistant, **Susan Kauble**	31	5A48	496-2411	2490
Administrative Officer, **Valery D. Gheen**	31	5A33	496-5931	2490
Management Policy and Administrative Services Branch				
Chief, **David L. Whitmer**	31	5A33	496-5931	2490
Freedom of Information/Privacy Act				
Coordinator, **Suzanne Freeman**	31	5A33	496-9737	2490
Financial Management Branch				
Chief, **Sandra Gault**	31	5A48	496-4653	2490
Personnel Management Branch				
Chief, **Barry Rubinstein**	31	5A28	496-6477	2484
Extramural Administrative Management Branch				
Chief, **Christinia E. Roark**	RKL2§	7026	435-6373	7921
Intramural Administrative Management Branch				
Chief, **Carrol Hanson**	10	7N220	402-1985	1670
National Center on Sleep Disorders Research				
Director, **Carl E. Hunt, M.D.**	RKL2	10038	435-0199	7920
Administrative Officer, **Stacey Long**	RKL2	7121	435-6373	7921
Women's Health Initiative				
Acting Director, **Jacques E. Rossouw, M.D.**	RKL1**	300	402-2900	7966
Administrative Officer, **Valery D. Gheen**	31	5A33	496-5931	2490

* Current as of October 15, 2001. 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 Home Page under About NHLBI.
† MSC—Mail Stop Code.
‡ Full mailing address formats are located at the end of this chapter.
§ RKL2—Rockledge II Building.
** RKL1—Rockledge I Building.

Office of the Director (continued)	**Bldg.**	**Room**	**Phone**	**MSC**
Office of Prevention, Education, and Control				
Director, **Gregory J. Morosco, Ph.D., M.P.H.**	31	4A03	496-5437	2480
Administrative Officer, **Rebecca E. Tener**	31	5A33	496-5931	2490
Health Communications and Information Science				
Senior Manager, **Terry C. Long**	31	4A03	496-0554	2480
Public Health Program Development				
Senior Manager, **Robinson Fulwood, M.S.P.H.**	31	4A03	496-0554	2480
National High Blood Pressure Education Program				
Coordinator, **Edward J. Roccella, Ph.D., M.P.H.**	31	4A16	496-1051	2480
National Cholesterol Education Program				
Coordinator, **James I. Cleeman, M.D.**	31	4A16	496-1051	2480
National Asthma Education and Prevention Program				
Coordinator, **Diana Schmidt, 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
Administrative Officer, **Rebecca E. Tener**	31	5A33	496-5931	2490
Office of International Programs				
Director, **Ruth 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 Special Issues Program				
Director, **Barbara Liu, S.M.**	31	5A06	496-9899	2482
Office of Legislative and Public Liaison				
Coordinator, **Sandra Lindsay, M.P.H.**	31	5A07	496-9899	2482
Information Resources and Technology Program				
Director, **John J. Filigenzi**	RKL2	8093	435-0119	7932
Office of Technology Transfer and Development				
Director, **Concetta Bartosh, J.D.**	31	1B30	402-5579	2490
Division of Heart and Vascular Diseases				
Director, **Stephen C. Mockrin, Ph.D.**	RKL2	9160	435-0466	7940
Deputy Director, **David M. Robinson, Ph.D.**	RKL2	9158	435-0477	7940
Special Assistant for Clinical Studies,				
Basil Rifkind, M.D.	RKL2	10190	435-0545	7956
Research Training and Special Programs,				
Leader, **Beth Schucker, M.S.**	RKL2	9140	435-0535	7940
Administrative Officer, **Lisa A. Freeny**	RKL2	7110	435-6373	7921
Heart Research Program				
Director, **John L. Fakunding, Ph.D.**	RKL2	9170	435-0494	7940
Arrhythmias, Ischemia, and Sudden Cardiac				
Death Scientific Research Group				
Leader, **Peter M. Spooner, Ph.D.**	RKL2	9192	435-0504	7940

Division of Heart and Vascular Diseases (continued)	**Bldg.**	**Room**	**Phone**	**MSC**
Heart Development, Function, and Failure Scientific Research Group				
Leader, **Gail D. Pearson, M.D. Sc.D.**	RKL2	9200	435-0510	7940
Vascular Research Program				
Director, **Sonia Skarlatos, Ph.D.**	RKL2	10198	435-0545	7956
Atherosclerosis Scientific Research Group				
Leader, **Momtaz Wassef, Ph.D.**	RKL2	10188	435-0558	7956
Hypertension Scientific Research Group				
Leader, **Paul A. Velletri, Ph.D.**	RKL2	10202	435-0560	7956
Clinical and Molecular Medicine Program				
Director, **John Watson, Ph.D.**	RKL2	9166	435-0555	7940
Cardiovascular Medicine Scientific Research Group				
Leader, **Patrice Desvigne-Nickens, M.D.**	RKL2	9178	435-0515	7940
Bioengineering and Genomic Applications Scientific Research Group				
Leader, **Frank D. Altieri, Ph.D.**	RKL2	9144	435-0513	7940
Division of Lung Diseases				
Director, **James P. Kiley, Ph.D.**	RKL2	10122	435-0233	7952
Deputy Director, **Carol E. Vreim, Ph.D.**	RKL2	10120	435-0233	7952
Administrative Officer, **Kathryn Lightbody**	RKL2	7120	435-6373	7921
Airway Biology and Disease Program				
Director, **Gail G. Weinmann, M.D.**	RKL2	10210	435-0202	7952
Senior Scientific Advisor, **Susan P. Banks-Schlegel, Ph.D.**	RKL2	10220	435-0202	7952
Asthma Scientific Research Group				
Leader, **Susan P. Banks-Schlegel, Ph.D.**	RKL2	10220	435-0202	7952
Chronic Obstructive Pulmonary Disease/Environment Scientific Research Group				
Leader, **Thomas Croxton, M.D., Ph.D.**	RKL2	10208	435-0202	7952
Cystic Fibrosis Scientific Research Group				
Leader, **Susan P. Banks-Schlegel, Ph.D.**	RKL2	10220	435-0202	7952
Sleep and Neurobiology Scientific Research Group				
Leader, **Michael J. Twery, Ph.D.**	RKL2	10116	435-0202	7952
Training and Special Programs Scientific Research Group				
Leader, **J. Sri Ram, Ph.D.**	RKL2	10206	435-0202	7952
Lung Biology and Disease Program				
Director, **Dorothy B. Gail, Ph.D.**	RKL2	10100	435-0222	7952
Senior Scientific Advisor, **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
Acute Lung Injury Scientific Research Group				
Leader, **Andrea Harabin, Ph.D.**	RKL2	10012	435-0222	7952
Critical Care Scientific Research Group				
Leader, **Robert A. Musson, Ph.D.**	RKL2	10108	435-0222	7952

Division of Lung Diseases (continued)	**Bldg.**	**Room**	**Phone**	**MSC**
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, **Susan Garfinkel, Ph.D.**	RKL2	10104	435-0222	7952
Training and Special Programs Scientific Research Group				
Leader, **Sandra Hatch, M.D.**	RKL2	10124	435-0222	7952

Division of Blood Diseases and Resources

Acting Director, **Charles Peterson, M.D.**	RKL2	10160	435-0080	7950
Deputy Director, **(Vacant)**	RKL2	10162	435-0080	7950
Senior Program Analyst, **Susan Pucie**	RKL2	10166	435-0584	7950
Administrative Officer, **Kathryn Lightbody**	RKL2	7120	435-6373	7921
Blood Resources Program				
Director, **Liana Harvath, Ph.D.**	RKL2	10170	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, **LeeAnn Jensen, Ph.D.**	RKL2	10140	435-0065	7950
Thrombosis and Hemostasis Scientific Research Group				
Leader, **Pankaj Ganguly, Ph.D.**	RKL2	10176	435-0070	7950
Training and Special Programs				
Leader, **Joyce I. Creamer, M.B.A.**	RKL2	10170	435-0061	7950
Blood Diseases Program				
Director, **Charles Peterson, M.D.**	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, **Charles Peterson, M.D.**	RKL2	10158	435-0050	7950
Training and Special Programs				
Leader, **Ellen Werner, Ph.D.**	RKL2	10182	435-0061	7950

Division of Epidemiology and Clinical Applications

Director, **Peter Savage, M.D.**	RKL2	8104	435-0422	7938
Deputy Director, **Peter Savage, M.D.**	RKL2	8104	435-0422	7938
Acting Nutrition Coordinator, **Catherine Loria, Ph.D.**	RKL2	8150	435-0701	7934
Administrative Officer, **Charlotte Wiltshire**	RKL2	7118	435-6373	7921
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

Division of Epidemiology and Clinical Applications (continued)	**Bldg.**	**Room**	**Phone**	**MSC**
Behavioral Medicine Scientific Research Group				
Leader, **Peter G. Kaufmann, Ph.D.**	RKL2	8118	435-0404	7936
Epidemiology and Biometry Program				
Director, **Teri Manolio, M.D., M.H.S.**	RKL2	8160	435-0707	7934
Analytical Resources Scientific Research Group				
Leader, **Paul D. Sorlie, Ph.D.**	RKL2	8176	435-0707	7934
Genetic Epidemiology Scientific Research Group				
Leader, **Richard Fabsitz, M.A.**	RKL2	8178	435-0444	7934
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			
Jackson Heart Study				
Leader, **Evelyn Walker, M.D.**	350 West Woodrow Wilson Drive Jackson, MS 39213 (601) 982-1133, ext. 22			

Division of Extramural Affairs

Director, **Deborah P. Beebe, Ph.D.**	RKL2	7100	435-0260	7922
Deputy Director, **(Vacant)**	RKL2	7216	435-0266	7924
Administrative Officer, **Veronica M. Wharton**	RKL2	7112	435-6373	7921
Committee Management Officer, **Kathryn M. Valeda**	RKL2	7220	435-0255	7922
Review Branch				
Chief, **(Vacant)**	RKL2	7178	435-0270	7924
Referral Officer, **Anne Clark, Ph.D.**	RKL2	7202	435-0310	7924
Special Assistant, **Louise P. Corman, Ph.D.**	RKL2	7180	435-0270	7924
Cardiology/Pulmonary Scientific Review Group				
Leader, **Diane M. Reid, M.D.**	RKL2	7182	435-0277	7924
Vascular/Blood Scientific Review Group				
Leader, **Jeffrey H. Hurst, Ph.D.**	RKL2	7208	435-0303	7924
Clinical Studies and Training Scientific Review Group				
Leader, **Joyce A. Hunter, Ph.D.**	RKL2	7194	435-0288	7924
Contracts Operations Branch				
Chief, **Robert Best**	RKL2	6100	435-0330	7902
Deputy Chief, **Douglas W. Frye**	RKL2	6106	435-0340	7902
Blood Diseases and Resources Contract Section				
Chief, **Patricia E. Davis**	RKL2	6136	435-0357	7902
Heart, Lung, and Vascular Diseases Contract Section				
Acting Chief, **Pamela Lew**	RKL2	6104	435-0340	7902
Epidemiology and Clinical Applications Section				
Chief, **John C. Taylor**	RKL2	6126	435-0345	7902
Procurement Section				
Chief, **Debra C. Hawkins**	RKL2	6150	435-0366	7902
Grants Operations Branch				
Chief, **Edward M. Donohue**	RKL2	7160	435-0144	7926

Division of Extramural Affairs (continued)	**Bldg.**	**Room**	**Phone**	**MSC**
Deputy Chief, **Jane R. Davis**	RKL2	7174	435-0166	7926
Heart and Vascular Diseases Grant Management Section				
Chief, **David Reiter**	RKL2	7172	435-0177	7926
Lung Diseases Section				
Chief, **Raymond L. Zimmerman**	RKL2	7156	435-0171	7926
Blood Diseases and Resources Section				
Chief, **Suzanne A. White**	RKL2	7158	435-0170	7926

Division of Intramural Research

Clinical Research Program				
Director, **Elizabeth G. Nabel, M.D.**	10	8C103	496-1518	1754
Office of Clinical Affairs				
Associate Director, **Maria Staggnito**	10	8C104	496-2295	1754
Office of Education				
Chief, **Herbert Geller, Ph.D.**	10	8C213	435-6719	1754
Intramural Administrative Management Branch				
Chief, **Carroll Hanson**	10	7N220	402-1985	1670
Cardiovascular Branch				
Chief, **Toren Finkel, M.D., Ph.D.**	10	7B15	451-8012	1650
Clinical Cardiology Section				
Chief, **Richard O. Cannon, M.D.**	10	7B15	496-9899	1650
Vascular Biology Section				
Chief, **Elizabeth G. Nabel, M.D.**	50	4523	594-9209	8016
Molecular Biology Section				
Chief, **Toren Finkel, M.D., Ph.D.**	10	6N240	402-4081	1622
Experimental Atherosclerosis Section				
Chief, **Howard S. Kruth, M.D.**	10	5N113	496-4826	1422
Hematology Branch				
Chief, **Neal S. Young, M.D.**	10	7C103	496-5093	1652
Molecular Disease Branch				
Chief, **H. Bryan Brewer, M.D.**	10	7N117	496-5095	1666
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
Pulmonary/Critical Care Medicine Branch				
Chief, **Joel Moss, M.D., Ph.D.**	10	6D03	496-1597	1590
Deputy Chief, **Martha Vaughan, M.D.**	10	5N307	496-4554	1434
Biochemical Physiology Section				
Chief, **Vincent Manganiello, M.D., Ph.D.**	10	5N307	496-1770	1434
Clinical Studies Section				
Chief, **Joel Moss, M.D., Ph.D.**	10	6D03	496-1597	1590
Metabolic Regulation Section				
Chief, **Martha Vaughan, M.D.**	10	5N307	496-4554	1434
Molecular Mechanism Section				
Chief, **Joel Moss, M.D., Ph.D.**	10	6D03	496-1597	1590
Pulmonary and Cardiac Assist Devices Section				
Chief, **Theodor Kolobow, M.D.**	10	5D17	496-2057	1590

Division of Intramural Research (continued)	**Bldg.**	**Room**	**Phone**	**MSC**
Cardiothoracic Surgery Branch				
Chief, **(Vacant)**	10	8C103	496-1518	1754
Laboratory of Animal Medicine and Surgery				
Chief, **Robert F. Hoyt, Jr., D.V.M.**	14E	106B	496-9673	5570
Laboratory Research Program				
Director, **Robert S. Balaban, Ph.D.**	10	7N214	496-2116	1670
Intramural Administrative Management Branch				
Chief, **Carroll Hanson**	10	7N220	402-1985	1670
Laboratory of Biochemical Genetics				
Chief, **Marshall Nirenberg, Ph.D.**	36	1C06	496-5208	4036
Molecular Biology Section				
Chief, **Marshall Nirenberg, Ph.D.**	36	1C27	496-5208	4036
Laboratory of Biochemistry				
Chief, **P. Boon Chock, Ph.D.**	50	2134	496-2073	8012
Enzymes Section				
Chief, **Earl R. Stadtman, Ph.D.**	50	2140	496-4096	8012
Intermediary Metabolism and Bioenergetics Section				
Chief, **Thressa C. Stadtman, Ph.D.**	50	2120	496-3002	8012
Protein Chemistry Section				
Chief, **R. Ann Ginsburg, Ph.D.**	50	2339	496-1278	8012
Metabolic Regulation Section				
Chief, **P. Boon Chock, Ph.D.**	50	2134	496-2073	8012
Protein Function in Disease Section				
Chief, **Rodney L. Levine, M.D., Ph.D.**	50	2351	496-2310	8012
Laboratory of Biophysical Chemistry				
Chief, **Henry M. Fales, Ph.D.**	50	3305	496-2135	8014
Chemical Structure Section				
Chief, **Henry M. Fales, Ph.D.**	50	3305	496-2135	8014
Computational Biophysics Section				
Chief, **Bernard Brooks, Ph.D.**	50	3306	496-0148	8014
Optical Spectroscopy Section				
Chief, **Jay R. Knutson, Ph.D.**	10	5D10	496-2557	1412
Structural Biophysics Section				
Chief, **James A. Ferretti, Ph.D.**	50	3517	496-3341	8014
Laboratory of Cardiac Energetics				
Chief, **Robert S. Balaban, Ph.D.**	10	B1D416	496-3658	1061
Laboratory of Cell Biology				
Chief, **Edward D. Korn, Ph.D.**	50	2517	496-1616	8017
Cellular Physiology Section				
Chief, **Evan Eisenberg, M.D., Ph.D.**	50	2525	496-2846	8017
Cellular Biochemistry and Ultrastructure Section				
Chief, **Edward D. Korn, Ph.D.**	50	2517	496-1616	8017
Cell Differentiation Section				
Chief, **Mathew Daniels, Ph.D.**	50	3318	496-2898	8017
Macromolecules Section				
Chief, **Alan Peterkofsky, Ph.D.**	50	2316	496-2408	8017
Molecular Cell Biology Section				
Chief, **John A. Hammer, III, Ph.D.**	50	2306	496-8960	8017
Laboratory of Cell Signaling				
Chief, **Sue Goo Rhee, Ph.D.**	50	3523	496-9646	8015

Division of Intramural Research (continued)	**Bldg.**	**Room**	**Phone**	**MSC**
Laboratory of Developmental Biology				
Chief, **Cecilia Lo, Ph.D.**	50	4537	451-8041	8019
Laboratory of Kidney and Electrolyte Metabolism				
Chief, **Maurice B. Burg, M.D.**	10	6N260	496-3187	1598
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	6N260	496-3064	1598
Transport Physiology Section				
Chief, **Kenneth R. Spring, Ph.D.**	10	6N309	496-3236	1598
Laboratory of Lymphocyte Biology				
Chief, **Barbara E. Bierer, M.D.**	10	6C208	496-6786	1586
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
Molecular Physiology Section				
Chief, **Neal Epstein, M.D.**	10	8N112	496-2102	1760
Muscle Molecular Biology Section				
Chief, **Robert S. Adelstein, M.D.**	10	8N202	496-1865	1762
Laboratory of Molecular Immunology				
Chief, **Warren J. Leonard, M.D.**	10	7N252	496-0098	1674
Intracellular Signaling Section				
Chief, **Michael A. Beaven, Ph.D.**	10	8N114	496-6188	1760
Lymphocyte Activation Section				
Chief, **Warren J. Leonard, M.D.**	10	7N252	496-0098	1674
Molecular and Cellular Toxicology Section				
Chief, **Lance R. Pohl, Ph.D.**	10	8N115	496-4841	1760
Core Facilities				
Pathology Section				
Chief, **(Vacant)**	10	2N240	402-0908	1518
Light Microscopy Core Facility				
Facility Head, **Christian Combs, Ph.D.**	10	5D19	594-6739	1061
Transgenic Core Facility				
Facility Head, **Cheng Liu, Ph.D.**	14F	113	435-5034	5570
Electron Microscopy Core Facility				
Facility Head, **Yuhui Xu, Ph.D.**	50	3314	402-2795	8017
Bioinformatics Core Facility				
Facility Head, **Eric Billings, Ph.D.**	50	3310	496-6520	8017
Flow Cytometry Core Facility				
Facility Head, **Philip McCoy, Ph.D.**	10	4A07	451-8824	1754

NIH Mailing Address Formats

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

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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†

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

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

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

* Retain the letters MSC before adding the mail stop code number.
† Replace the letters MSC with the mail stop code number.

2. Program Overview

In 1948, the National Heart Institute was established through the National Heart Act with a mission to support research and training in the prevention, diagnosis, and treatment of cardiovascular diseases (CVD). Twenty-four years later, through section 413 of the National Heart, Blood Vessel, Lung, and Blood Act (P.L. 92-423), Congress mandated the Institute to expand and coordinate its activities in an accelerated attack against heart, blood vessel, lung, and blood diseases. The renamed National Heart, Lung, and Blood Institute (NHLBI) expanded its scientific areas of interest and intensified its efforts related to research on diseases within its purview. Over the years, these areas of interest have grown to encompass genetic research, sleep disorders, and the Women's Health Initiative (WHI).

The mission of the NHLBI is to provide leadership for a national program in diseases of the heart, blood vessels, lung, and blood; sleep disorders; and blood resources management. The Institute:

- Plans, conducts, fosters, and supports an integrated and coordinated program of basic research, clinical investigations and trials, observational studies, and demonstration and education projects related to the causes, prevention, diagnosis, and treatment of heart, blood vessel, lung, and blood diseases, and sleep disorders conducted in its own laboratories and by other scientific institutions and individuals supported by research grants and contracts.
- Plans and directs research in development, trial, and evaluation of interventions and devices related to the prevention of diseases and the treatment and rehabilitation of patients suffering from such diseases and disorders.
- Conducts research on the clinical use of blood and all aspects of the management of blood resources.
- Supports career training and development of new and established researchers in fundamental sciences and clinical disciplines to enable them to conduct basic and clinical research related to heart, blood vessel, lung, and blood diseases; sleep disorders; and blood resources through individual and institutional research training awards and career development awards.
- Coordinates relevant activities with other research institutes and all Federal health programs in the above areas, including the causes of stroke.
- Conducts educational activities, including development and dissemination of materials for health professionals and the public in the above areas, with emphasis on prevention.
- Maintains continuing relationships with institutions and professional associations, and with international, national, state, and local officials, as well as voluntary agencies and organizations working in the above areas.
- Oversees management of the WHI.

Each year, the NHLBI assesses progress in the scientific areas for which it is responsible and updates its goals and objectives. As new opportunities are identified, the Institute expands and revises its areas of interest. Throughout the process, the approach used by the Institute is an orderly sequence of research activities that includes:

- Acquisition of knowledge
- Evaluation of knowledge
- Application of knowledge
- Dissemination of knowledge.

The programs of the NHLBI, as shown on page 12, are implemented through five extramural units: the Division of Heart and Vascular Diseases (DHVD), the Division of Lung Diseases (DLD), the Division of Blood Diseases and Resources (DBDR), the Division of Epidemiology and Clinical Applications (DECA), and the National Center on Sleep Disorders Research (NCSDR); and one intramural unit, the Division of Intramural Research (DIR). Although

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

Heart and Vascular Diseases

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

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

Clinical and Molecular Medicine
Cardiovascular Medicine
Bioengineering
Genomic Applications

Lung Diseases

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

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

Blood Diseases and Resources

Blood Diseases
Sickle Cell Disease (SCD)
Thalassemia
Cellular Hematology
Stem Cell Research

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
Analytical Resources
Genetic Epidemiology

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

Women's Health Initiative

Intramural Research
Cardiovascular
Cardiothoracic Surgery
Hematology
Molecular Disease
Pulmonary/Critical Care Medicine
Animal Medicine and Surgery
Biochemical Genetics
Biochemistry
Biophysical Chemistry
Cardiac Energetics
Cell Biology
Cell Signaling
Developmental Biology
Kidney and Electrolyte Metabolism
Lymphocyte Biology
Molecular Immunology

the NHLBI has primary responsibility for the WHI, it is run by a consortium that includes the National Cancer Institute (NCI), the National Institute on Aging (NIA), and the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS). The Divisions and the Center pursue their own scientific missions but cooperate in areas of common interest. The extramural Divisions and the NCSDR use a variety of funding mechanisms, such as research grants, program project grants, Small Business Innovation Research grants, Small Business Technology Transfer grants, Specialized Centers of Research (SCORs), comprehensive center grants, contracts, and research training programs. Descriptions of the Division and Center programs, as well as the WHI, follow.

Division of Heart and Vascular Diseases

An estimated 61.8 million people in the United States have CVD, 37 million of whom are less than 65 years of age. Hypertension affects 50 million. Approximately 13 million have coronary heart disease (CHD), almost 4.8 million have congestive heart failure (CHF), and 4.6 million have cerebrovascular disease. About 8 million with CVD are limited in activity. In 1999, 40 percent of all deaths (959,000) in the United States were attributed to CVD; 54 percent occurred in women. The economic cost of CVD to the Nation in 2002 is projected to be $329 billion, of which $199 billion will be for health-related expenditures and $130 billion will be due to lost productivity.

The DHVD plans and directs a coordinated research program on the causes of heart and vascular diseases and on their prevention, diagnosis, and treatment. Emphasis is placed on fundamental biomedical research. Multidisciplinary programs are supported to advance basic knowledge of disease and to generate the most effective methods of clinical management and prevention. Clini-

cal trials are an important part of the research program; they provide an opportunity to test and apply promising preventive or therapeutic measures.

The Division consists of three major programs:

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

and the Research Training and Special Programs group.

The Heart Research Program supports basic and clinical research in cardiac diseases, from embryonic life through adulthood. Areas of interest include:

- Heart development
- Cardiac function and failure
- Ischemic heart disease
- Cardiac arrhythmias and sudden cardiac death.

Studies are conducted on the normal functional and structural development of the heart and major blood vessels, as well as on the genetic, molecular, environmental, and mechanical etiology of congenital cardiovascular malformations. Scientists are seeking knowledge that will lead to improved techniques for diagnosing and treating congenital cardiovascular malformations and acquired pediatric heart disease. A new endeavor in pediatric heart disease research will involve the use of clinical research networks designed to promote efficient evaluation of novel treatment methods and management strategies.

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

Scientists engaged in research on ischemic heart disease are investigating the etiology and pathophysiology of the disease and its consequences. Studies include myocardial infarction (MI), angina pectoris, coronary thrombosis, coronary blood flow, and myocardial revascularization and reperfusion. Researchers are seeking ways to improve the diagnosis and treatment of myocardial ischemia. Of particular importance are programs directed at understanding the pathophysiology of ischemic heart disease in blacks.

Projects related to cardiac arrhythmia research are focused on elucidating the mechanisms involved in control of cardiac electrical activity, especially as it relates to sudden cardiac death. Scientists are seeking to understand how cardiac membrane biophysics, ion pumps and channels, and transport and gap junction proteins contribute to electrogenesis. They are also examining the impact of genetic influences—including examination of mutations underlying arrhythmic diseases—on arrhythmogenesis and sudden cardiac death. Of special importance are studies directed at understanding electrical remodeling and genetic defects in long QT syndrome (arrhythmic disease) and other arrhythmic disorders. Finding pharmacologic agents that are effective in regulating cardiac rhythm and rate is also a major research priority.

The Vascular Biology Research Program supports research in:

- Atherosclerosis
- Hypertension
- Biology and pathophysiology of blood vessels
- Gene therapy for prevention and treatment of vascular diseases.

Research in atherosclerosis encompasses its etiology, pathogenesis, diagnosis, prevention, and treatment. Targeted areas include characterization of atherosclerotic plaque prone to rupture, pathogenesis of abdominal aortic aneurysms, the roles of the immune system and homocysteinemia in atherosclerosis, mechanisms of accelerated atherosclerosis in diabetes mellitus, mechanisms of atherosclerosis in various vascular beds, and research on atherosclerotic lesions using human tissues. Additional areas of interest include thrombosis of the arterial and cerebral vasculature, interrelationships between atherosclerosis and hypertension, standardization of lipid measurements, development of animal models of diabetes complications, and development of accurate databases on the nutrient content of foods consumed by the U.S. population.

Hypertension research focuses on regulatory mechanisms associated with blood pressure control in order to identify causative factors of essential hypertension as well as rare forms of high blood pressure. Scientists are studying mechanisms by which high blood pressure increases the risk of, or occurs concomitantly with, other diseases, such as kidney failure, stroke, diabetes, atherosclerosis, preeclampsia, and left ventricular hypertrophy. Investigations of the molecular genetics of hypertension are under way.

Basic and clinical studies on arteriogenesis (formation of new arteries), angiogenesis (formation of new blood vessels), and the biology and pathophysiology of blood vessel structure and function in the cerebral, coronary, and peripheral vascular beds are designed to increase understanding of how oxygen, nutrient, and fluid exchange occurs within vessels; how vascular inflammatory response originates and contributes to CVD; how blood flow within the tissues is autoregulated; how new vessels are formed; and how vascular remodeling is orchestrated. Scientists are investigating ways to control the inflammatory response in blood vessels, manipulate mechanisms that regulate blood flow, and stimulate the formation of new blood vessels (especially after an ischemic event in the brain, heart, or a limb).

Gene transfer is being used to deliver growth factors to the myocardium to promote development of new blood vessels. Clinical trials are under way to test the safety and efficacy of this approach in humans. Ultimately, these studies should offer insight into developing new therapeutic agents for ischemic disease.

The Clinical and Molecular Medicine Program (CMMP) supports basic, applied, clinical, and engineering research in:

- Cardiovascular medicine
- Bioengineering
- Genomic applications.

Researchers in cardiovascular medicine are focusing their efforts mainly on studies of patients who already have CVD, but they are also engaged in studies of the role of lipid interventions, nutrition, exercise, and hormone therapy in preventing heart disease. Current projects encompass development of new treatment strategies for acute and chronic ischemic heart disease, cardiomyopathies of different etiologies (e.g., ischemic, valvular, genetic, metabolic, and HIV-related), congenital malformations, peripheral vascular disease, restenosis after revascularization procedures, and cardiovascular dysfunction in long-term pediatric cancer survivors. Examples of therapies and approaches include hormone replacement, dietary and medical management of dyslipidemia, quantitative measurement of atherosclerosis, diagnosis and management of arrhythmias, and cardiovascular applications of radiotherapy. Studies also seek to understand the disparities associated with minority and women's cardiovascular health.

Bioengineering applies engineering theory to the advancement of knowledge at the genetic, molecular, cellular, tissue, and organ levels, and to the development of new biologic materials, processes, devices, and systems. Research on the treatment of advanced heart failure is leading to the development of innovative ventricular assist systems and the artificial heart as a bridge to cardiac transplant or myocardial recovery, and eventually, to permanent circulatory support. A broad program of tissue engineering research at the basic and functional level, using biomimetic culture conditions and in vivo approaches, has been initiated to address the clinical need for functional tissue regeneration, repair, and replacement. Additional areas being supported include imaging techniques for CVD diagnosis and treatment in a diverse program of x-ray, magnetic resonance, positron emission, ultrasound, and nuclear medicine research projects, and molecular, cellular, and functional imaging methods.

Genomic applications covers the research and development of resources related to genetics, genomics, proteomics and gene transfer, as well as their application, for cardiovascular, pulmonary, and hematological diseases. The NHLBI Mammalian Genotyping Service, the NIH Single Nucleotide Polymorphism Discovery Program, the Rat Genome Program, the Rat Genome Database, and the Programs for Genomic Applications and Proteomics are individual programs being supported by the CMMP. Additional areas of focus include gene mapping studies to identify the genetic variation that underlies common CVDs, functional genomics, bioinformatics and biocomputing, and microarray development.

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 accounted for 231,000

deaths in 1999 and were a contributing factor to more than 300,000 additional deaths. More than 20 million persons have chronic bronchitis, emphysema, asthma, or other obstructive or interstitial lung diseases. In 1999, pulmonary diseases accounted for 28 percent of all hospitalizations of children younger than 15 years of age in the United States. The projected economic cost to the Nation in 2002 is about $116 billion, of which $65 billion will be for health-related expenditures and $50 billion will be for lost productivity.

The DLD plans and directs a coordinated research program on the causes and progression of lung diseases and on their prevention, diagnosis, and treatment. It focuses its efforts on understanding the biology and function of the respiratory system, increasing knowledge of the fundamental mechanisms associated with specific pulmonary disorders, and applying the findings to develop new treatment strategies for patients. Demonstration and education projects to transfer basic research and clinical findings to health care professionals and patients as well as training and career development programs for individuals interested in furthering their professional abilities in lung diseases research are also important activities. A variety of funding mechanisms, including research grants, contracts, cooperative agreements, SCORs, career development awards, fellowships, and research training grants are used to support these activities.

The DLD has two major programs:

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

The Airway Biology and Disease Program supports basic and clinical studies related to:

- Asthma
- Cystic fibrosis (CF)
- COPD and environmental lung diseases
- Neurobiology and sleep.

Scientists in asthma research are using several approaches to elucidate the etiology and pathophysiology of the disease. One strategy involves identifying susceptibility genes that influence its development, progression, and response to treatment in different racial groups. Another strategy focuses on cellular and molecular mechanisms associated with the development, exacerbation, and persistence of asthma and the impact of the environment on these mechanisms. Determining how the pathophysiology of severe asthma differs from that of mild-to-moderate asthma is also an area of interest.

Clinical networks are being used to improve asthma management in adults and children. They provide an effective means for rapid assessment of new treatments and ensure that research findings are quickly disseminated to health care professionals.

Scientists participating in CF research are investigating the origins and control of inflammatory and immune responses in the CF lung, examining loss of CF transmembrane conductance regulation on development of CF, determining the modifying effects of other genes on its manifestation, and delineating genetic and metabolic defects underlying pulmonary complication associated with CF. Developing new genetic, pharmacologic, and nonpharmacologic (e.g., gene transfer) treatments is also an area of focus.

Research in COPD, which includes chronic bronchitis and emphysema, is concerned with understanding the underlying causes of the disorder and improving disease treatment and management. Investigators are examining the role of inflammation in the pathogenesis of COPD; seeking to identify and characterize biomarkers of COPD presence, severity, and exacerbation; evaluating treatment strategies—lung volume reduction surgery, long-term smoking cessation intervention, and retinoic acid therapy; and applying gene therapy to correct the defective gene or to introduce the functional gene for alpha-1 antitrypsin in deficient individuals with familial emphysema.

Scientists in sleep research are directing their efforts toward understanding the neurobiology of breathing control during sleep and sleep apnea, examining the health consequences of sleep disordered breathing, and developing treatment for sleep apnea.

The Lung Biology and Disease Program is involved in research related to:

- Lung cell and vascular biology
- Developmental biology and pediatric lung disease
- Critical care and acute lung injury
- AIDs and TB
- Immunology and fibrosis.

The molecular and cellular biology of alveolar epithelial and endothelial cells and the lung surfactant system

are important areas of interest for scientists in lung cell and vascular biology research. Researchers are examining regulation of the pulmonary vasculature, including cell growth and signaling, and effects of different substances on pulmonary circulation, in order to understand lung cell function following injury. They are also seeking to identify novel genes related to lung function and to develop new methods to deliver drugs via lung epithelial cells. Additional research focuses on the etiology and pathogenesis of pulmonary hypertension.

Scientists involved in research related to developmental biology and pediatric lung disease are investigating normal lung development and factors that contribute to abnormal lung development. They are studying prenatal and postnatal infections and reactive inflammation on the subsequent course of lung development and during fragile stages of lung maturation in infancy and early childhood. The purpose of the studies is to gain information on the development of immunity in the lung as a factor in both immediate lung development and long-term lung function. In addition, these scientists are trying to identify genes and molecules that regulate the formation of lung alveoli in order to design new treatments for lung diseases in children and adults. Clinical trials are underway to evaluate the safety and efficacy of nitric oxide in preventing and treating chronic lung disease in newborn infants.

The Program supports multidisciplinary approaches to improving our understanding of the etiology and pathophysiology of acute lung injury and the molecular and cellular pathogenesis of acute respiratory distress syndrome (ARDS). In addition, it maintains an ARDS network to evaluate the efficacy of different therapeutic strategies, such as pulmonary artery catheterization versus central venous catheterization and anti-inflammatory agents, including corticosteroids, in patients with the disorder and those at risk.

AIDS researchers are seeking to develop animal models of HIV-related lung disease that will allow them to study the basic pathogenetic mechanisms involved in lung disorders, with the ultimate goal of providing information that will lead to new treatment strategies. Pneumocystis pneumonia, lymphoid interstitial lung diseases, and TB are among the prominent complications found in HIV patients. Clinical studies include various racial groups as well as a pediatric population.

Other Program interests include investigations related to interstitial diseases (e.g., multicenter studies of etiology, environmental risk factors, and genetics of sarcoidosis); a multicenter study of inherited genes that increase susceptibility to pulmonary fibrosis; and a multicenter clinical trial of cyclophosphamide in the treatment for pulmonary fibrosis in scleroderma patients. Examination of the causes of noninfectious pneumonia associated with bone marrow transplantation, elucidation of cellular and molecular mechanisms of primary pulmonary hypertension and of lymphangioleiomyomatosis (LAM), and creation of a molecular profile of bronchopulmonary dysplasia that will advance understanding of the condition and lead to effective clinical interventions are also priority areas.

Division of Blood Diseases and Resources

Blood diseases, including both acute and chronic disorders, resulted in 268,000 deaths in 1999; 258,000 of them were due to thrombotic disorders, and 10,000 were due to diseases of the red blood cells and bleeding disorders. In 2002, thrombotic disorders and other blood diseases will cost an estimated $87 billion, of which $54 billion will be for health expenditures and $33 billion for lost productivity.

The DBDR has a dual role within the Institute. It develops, administers, and coordinates programs both to reduce the morbidity and mortality caused by blood diseases and to lead to their primary prevention. Diseases addressed include sickle cell anemia, hemophilia, Cooley's anemia (also known as thalassemia), and disorders of hemostasis and thrombosis. The Division also has responsibility for ensuring the adequacy and safety of the Nation's blood supply. A full range of activities, including studies of the 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. Education and demonstration activities are supported to ensure that the research knowledge gained is translated and disseminated to physicians, health care professionals, patients, and the public. The Division uses a variety of funding mechanisms, including research grants, contracts, cooperative agreements,

centers, career development awards, fellowships, and research training grants to support its mission.

The Division consists of two programs:

- Blood Diseases Program
- Blood Resources Program.

The Blood Diseases Program focuses its research and training on hematology and hematologic diseases, including:

- Thalassemia
- Sickle cell disease
- Cellular hematology
- Stem cell research.

Research in thalassemia and SCD encompasses the etiology and pathophysiology of the disorders as well as patient treatment and management. Scientists are focusing their efforts on the regulation of hemoglobin synthesis, iron chelation, development of drugs that increase fetal hemoglobin production, gene therapy, stem cell transplantation, and animal models.

Clinical projects in SCD are concerned with the natural history of the disorder, stroke prevention, and long-term effects of hydroxyurea therapy in adults. A Phase III clinical trial of hydroxyurea is under way to determine if the therapy is effective in preventing chronic end organ damage in children with SCD.

A thalassemia clinical network has been established to evaluate new treatment strategies and ensure that research findings on optimal management of the disease are rapidly disseminated to practitioners and health care professionals.

Research in cellular hematology emphasizes the basic structural and functional relationships of red blood cells and white blood cells. Areas of interest in the red cell include not only basic and clinical studies of hemoglobin but also the role of receptors, adhesion and interaction with coagulation factors, platelets, and white cells in the initiation and propagation of disease. White blood cell research focuses on lymphogenesis, the ontogeny of various white blood cell populations, and the generation of stem cells and their progeny, as well as the role of white blood cells in acute and chronic illness relevant to the Institute.

Stem cell research is directed toward the development of an effective treatment involving gene therapy to cure SCD. Scientists are focusing on new, less toxic conditioning regimens and other factors that could have a positive impact on engraftment.

The Blood Resources Program plans and directs research and training in:

- Thrombosis and hemostasis
- Bone marrow transplantation
- Transfusion medicine.

Research in thrombosis and hemostasis is directed toward understanding the pathogenesis of both arterial and venous thrombosis. Scientists are seeking to gain knowledge that will lead to improved diagnosis, prevention, and treatment of thrombosis in MI and stroke. One of the goals is to find additional platelet inhibitors, anticoagulants, and fibrinolytic agents that will improve specificity and reduce side effects when used in treatment.

Finding an effective treatment for hemophilia is another major priority. Researchers are using different approaches to study gene therapy for the disorder. Three Phase I clinical trials to test the safety of these procedures are underway. Bleeding disorders related to defects in coagulation proteins or abnormal platelet function, such as the immune thrombocytopenias, are also being investigated.

Bone marrow transplantation research focuses on basic and clinical studies in allogeneic blood and marrow transplantation, including graft versus host disease (GVHD), use of unrelated donors, tolerance induction, and clinical trials using cord blood and T-cell depleted grafts. Major concerns involve overcoming HLA matching barriers so that more patients will have access to potential donors, and modifying toxic pretransplant regimens that are used to eradicate a patient's blood cell system and enhance engraftment. Additional areas of interest include graft engineering; ex vivo expansion of stem and progenitor cells for clinical use; and diagnosis, prevention of pathogenesis, and treatment of major complications from transplantation.

Research in transfusion medicine includes studies of transmission of disease through transfusion, development of methods to inactivate viruses in donated blood, improvement of blood donor screening procedures, and studies of emerging diseases that may be transmitted by

blood transfusions. Scientists are involved in basic and clinical investigations related to transfusion immunobiology, focusing on GVHD, graft versus leukemia effect, and dendritic cell therapies.

Division of Epidemiology and Clinical Applications

The DECA plans, directs, and evaluates research on the causes, prevention, diagnosis, and treatment of cardiovascular, lung, and blood disease, as well as on the need for technological development in the acquisition and application of research findings in these areas. It supports epidemiologic studies, clinical trials, demonstration and education research, disease prevention and health promotion research, and basic and applied research in behavioral medicine. A variety of funding mechanisms is used, including research grants, contracts, cooperative agreements, career development awards, fellowships, and research training grants.

The Division has two major programs:

- Clinical Applications and Prevention Program
- Epidemiology and Biometry Program

and includes the Office of Biostatistics Research.

The Clinical Applications and Prevention Program is divided into three major areas:

- Prevention
- Clinical trials
- Behavioral medicine.

Research in the prevention of cardiovascular, lung, and blood diseases encompasses activities such as clinical trials, community intervention studies, prevention trials, nutrition studies, health education research, and behavioral medicine studies. The Program supports a number of multicenter prevention and education trials to test the efficacy and effectiveness of, and demonstrate the capability of, prevention strategies designed to reduce cardiovascular risk factors. Major studies include determining the effectiveness of school- and home-based interventions to reduce development of CVD risk factors in children, especially those from minority populations; examining the effects of dietary patterns, sodium intake, and other lifestyle factors on blood pressure; and comparing the efficacy of various treatments to prevent major cardiovascular events in adults with diabetes. Studies on increasing the implementation of interventions known to be effective are of particular interest.

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

Research in behavioral medicine focuses on biopsychologic and sociocultural factors involved in heart, lung, and blood diseases. Study participants encompass individuals at all levels of health and from all ages and racial groups. Areas of interest include central nervous system regulation of the cardiovascular system; identification of psychosocial factors (social support, depression, and hostility) affecting disease etiology, treatment, and rehabilitation; and effects of psychosocial and behavioral interventions on risk factors (smoking, adverse diet, physical inactivity), disease outcomes, and quality of life.

The Epidemiology and Biometry Program supports and conducts research using:

- Field studies and clinical epidemiology
- Genetic epidemiology
- Analytical resources.

Investigators are conducting long-term epidemiological studies of heart and vascular, lung, and blood diseases in defined populations in the United States and other countries. These studies focus on the development and progression of CVD risk factors in children and young adults, the development and progression of atherosclerosis measured noninvasively or at autopsy in middle-aged or older adults, and the development and progression of overt cardiovascular and pulmonary disease in older adults. Areas of emphasis include genetic and environmental influences on CVD and its risk factors; trends in incidence, prevalence, and mortality from CVD, stroke, peripheral vascular disease, congestive heart failure, and cardiomyopathy; and relationships

between insulin, insulin resistance, and overt diabetes and CVD and its risk factors. Another area of interest is the incidence of and mortality from cardiovascular, lung, and blood diseases. Research strategies apply family, longitudinal, demographic, and vital statistics to study the natural history, etiology, and epidemiology of those diseases.

Genetic epidemiology has become an increasingly important component of the DECA Research Program. Several long-term studies of twins, multiple generations, Native Americans, and blacks focus on related individuals to determine the role of genes in the development of CVD risk factors and CVD. Other long-term studies are storing DNA and testing candidate genes from unrelated individuals. In addition to examining associations between CHD risk factors and development of atherosclerosis, heart failure, cardiomyopathy, and stroke in adults and the elderly, investigators will seek to identify and characterize genes related to CHD and atherosclerosis and to determine how they interact with environmental factors in the development of disease. A new study was initiated to identify genetic factors influencing coronary and aortic calcification and individual variability in the inflammatory response.

The Program also focuses on understanding the relationships between insulin, insulin resistance, overt diabetes, and CVD and its risk factors. Scientists are attempting to find and characterize genes linked to risk factors that are associated with the insulin resistance syndrome and diabetes. Research strategies include family and longitudinal studies in racially diverse populations.

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

National Center on Sleep Disorders Research

An estimated 70 million people in the United States suffer from sleep problems, and nearly 60 percent of them have a chronic disorder. About 30 million U.S. adults have frequent or chronic insomnia, approximately 12 million have sleep apnea, and an estimated 250,000 have narcolepsy. Additionally, approximately 100,000 accidents and 1,500 traffic fatalities a year are sleep-related. More than 50 percent of Americans over age 65 have sleep difficulties. As the over-65 population grows, sleep problems will affect an even greater proportion of the U.S. population. Each year, sleep disorders, sleep deprivation, and excessive daytime sleepiness add $16 billion to the national health care bill.

The NCSDR plans, directs, and supports a program of basic, clinical, and applied research, health education, research training, and prevention-related research in sleep, chronobiology, and sleep disorders. It oversees developments in its program areas; assesses the national needs for research on causes, diagnosis, treatment, and prevention of sleep disorders and sleepiness; and coordinates sleep research activities across the Federal Government and with professional, voluntary, and private organizations. The Center promotes information-sharing among these groups and encourages their cooperation to plan and implement relevant interdisciplinary programs.

The neurobiology of sleep and sleep apnea and the cardiovascular effects of sleep-related breathing disorders continue to be major areas of emphasis for the NCSDR. In FY 2001, new programs were announced on sleep disorders in children and on the interrelationship of sleep to heart, lung, and blood diseases in children and adults. Workshops focusing on the role of bioinformatics in sleep disorders research and on the neurobiology of insomnia were also held to identify gaps in knowledge and to prioritize opportunities for new research.

Multidisciplinary research training programs in sleep biology and sleep disorders are being supported to ensure that highly trained scientists are available to address important gaps in the current biomedical and biological understanding of sleep, including those outlined in the NIH Director's Sleep Disorders Research Plan. Among them is the Sleep Academic Award Program, designed to develop comprehensive curricula on sleep and sleep disorders for enhanced learning by medical students, resident and practicing physicians, and other health care professionals. In collaboration with the American Academy for Sleep Medicine, the Sleep Academic Award Program developed a Web page that includes more than 50 curricular resources for basic science and clinical educators in the health sciences.

The NCSDR continues to work closely with the NHLBI Office of Prevention, Education, and Control (OPEC) on sleep disorder education for physicians and the general public. Reaching children and adolescents with messages about sleep and sleep disorders is a major priority. In 2001, the Center, with OPEC and Paws, Inc. (the creative studio behind Garfield), launched a major 5-year public health initiative directed to children 7 to 11 years of age, their parents, teachers, and pediatricians. This Star Sleeper Campaign uses Garfield as the "spokescat" for healthy sleep. A major theme is "sleep well; do well." In addition to distribution of media resources, partnerships are being developed with elementary schools and the American Academy of Pediatrics to implement this community outreach educational program.

The NCSDR Web site has been revised to make it more user-friendly, to include more comprehensive sleep-related information, and to provide NCSDR publications for researchers, health professionals, patients, and the general public.

Women's Health Initiative

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

The WHI is a 15-year project consisting of three major components: a randomized, controlled, clinical trial of promising but unproven approaches to prevention; an observation study to identify predictors of disease; and a study of community approaches to developing healthful behaviors. The clinical trial and the observational study, involving more than 161,000 women, ages 50 to 79, will seek to answer questions about the benefits and risks of hormone replacement therapy (HRT) and about the effects of changes in dietary patterns and calcium/vitamin D supplements in disease prevention. The HRT component of the trial will study the effects of HRT on heart disease, osteoporosis-related bone fractures, and breast and endometrial cancer. The trial will enable scientists to assess both the benefits and risks of the therapy. The dietary modification component will examine the effects of a low-fat and high fruit, vegetable, and grain diet on heart disease, breast cancer, and colorectal cancer in postmenopausal women. The calcium/vitamin D component will test whether these supplements reduce the risk of colorectal cancer and the frequency of hip and other bone fractures in postmenopausal women.

Women who were ineligible or unwilling to participate in the clinical trial were encouraged to enroll in a concurrent long-term observational study to delineate new risk factors and biological markers for diseases, allow comparison with the clinical trial cohort findings, evaluate temporal relationships between risk factors and disease outcomes, and improve estimates of known predictors of disease by sociodemographic factors. The medical histories and health habits of approximately 100,000 women will be tracked. Recruitment for the observation study was completed in December 1998, and participants will be followed for 8 to 12 years.

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

The community prevention study component will focus on community-based strategies to enhance adoption of healthful behaviors, with a particular emphasis on women of diverse races, ethnic groups, and socioeconomic strata. The goal of this effort is to develop carefully evaluated model programs that can be implemented in a wide range of communities throughout the United States. Areas of interest include reduction of CVD among black women; peer support among black women; environmental factors and physical activity in women; osteoporosis prevention, education, and outreach; diabetes care in minority women; methods to enhance physical activity in women; and women's attitudes regarding surgical menopause and HRT.

Division of Intramural Research

The NHLBI DIR conducts clinical research on normal and pathophysiological functioning of the cardiac, pulmonary, blood, and vascular systems, and basic research on normal and abnormal cellular behavior at the molecular level. In FY 2001, the clinical and laboratory research programs were modified to consolidate some of the research effort. In the Clinical Research Program, the Cardiology and Vascular Biology Laboratories were combined to form the Cardiovascular Branch. In the Laboratory Research Program, the Laboratory of Devel-

opmental Biology was created, and the Laboratory of Molecular Biology was abolished.

Research foci of the 16 laboratories and branches and the core facilities range from structural organic chemistry to cardiology. Major areas of interest include mechanisms of gene regulation, gene transfer, and gene therapy; molecular basis of lipoprotein dysfunctions and atherogenic process; molecular basis of vascular diseases; molecular basis of diseases of alveolar structures of the lung and design of new therapeutic modalities; cellular and molecular events underlying ischemic heart disease and myocardial hypertrophy; biochemical events associated with aging and certain pathologic processes; molecular, structural, and developmental aspects of muscle and nonmuscle contractile systems; biochemistry and physiology of calcium channels; molecular and cellular processes for conversion of metabolic energy into useful work; molecular basis of transmembrane signaling and signal transduction pathways; pathophysiology of renal function at cellular and molecular levels; biochemistry of trace nutrients; enzyme kinetics, metabolic regulation, and protein chemistry; and cellular and molecular basis of toxicity induced by drugs and other foreign compounds.

The DIR is located on the 300-acre NIH campus in Bethesda. It has a staff of 723, including about 359 doctoral-level scientists, 65 of whom are in tenured or tenure-track positions; 1 Nobel Laureate; and 6 members of the National Academy of Sciences. Approximately 150 guest workers contribute importantly to the research. This combined staff occupies a total space of about 115,000 square feet and has the use of 53 beds in the Clinical Center of the NIH.

Office of Prevention, Education, and Control

The NHLBI OPEC coordinates the translation and dissemination of research findings and scientific consensus to health professionals, patients, and the public, so that information can be adapted for and integrated into health care practice and individual health behavior. To accomplish its mission, OPEC established health education programs and initiatives that address high blood pressure, high blood cholesterol, asthma, early warning signs of heart attack, obesity, and sleep disorders. The programs use two strategies: one focuses on individuals at high risk; the other focuses on the general public. The four largest programs have coordinating committees consisting of national medical, public health, and voluntary organizations and other Federal agencies. These committees help to plan, implement, and evaluate program efforts in professional, patient, and public education.

The National High Blood Pressure Education Program (NHBPEP) was initiated in 1972 to reduce death and disability related to high blood pressure through professional, patient, and public education programs. Special attention is directed to reducing health disparities among hypertensives. The program—a cooperative effort among the NHLBI, professional and voluntary health agencies, and State health departments—is a model for national health education programs that continues to be adopted by other national and international groups.

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

The program continues its mission of translating research results to improve medical care outcomes and the public's health. It is committed to raising public awareness of the importance of adopting a heart-healthy lifestyle. Research has identified steps that individuals can take to control their blood pressure and to lower their risk of heart disease. For example, certain dietary habits can decrease blood pressure and can prevent it from rising. The DASH diet—rich in fruits and vegetables, low in saturated and total fat and cholesterol, and containing low-fat dairy products—has been shown to be beneficial for individuals who have high blood pressure and for those who wish to prevent high blood pressure. Combined with reduction in salt intake, the diet can further reduce blood pressure.

In 2001, the NHBPEP unveiled new resources to help consumers control their blood pressure. "Lowering High Blood Pressure," a redesigned Web page that provides the latest research findings and relevant information on blood pressure control, can be accessed from the Institute's home page. In addition to tips on healthy eating, the site provides information on other behaviors that contribute to blood pressure control, such as maintaining a healthy weight, engaging in regular physical activity,

and abstaining from excessive amounts of alcohol. Information on medications and preeclampsia and on continuing education programs for clinicians is also available.

The NHBPEP participated in two NHLBI-sponsored workshops in FY 2001. One workshop focused on examining emerging issues related to blood pressure measurement devices, for example, the removal of mercury devices from hospital and clinics and the need to adjust blood pressure cuff size as the patient population becomes heavier. The other workshop examined research needs associated with hypertension and pregnancy.

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. From 1983 to 1995, the percentage of the public who had their cholesterol checked rose from 35 to 75 percent, showing that an additional 70 to 80 million Americans were aware of their cholesterol levels in 1995 than in 1983. Moreover, in 1995, physicians reported initiating diet and drug treatment at much lower cholesterol levels than in 1983. Major elements of the NCEP guidelines for detection and treatment have become established practice.

NHANES III (1988-1994) data demonstrate that the NCEP's dual strategy—one emphasizing the need for detection and treatment for individuals whose high blood cholesterol places them at increased risk for CHD and the other encouraging heart-healthy eating patterns to lower average cholesterol levels for the general public—has had a substantial effect on measured blood cholesterol levels of U.S. adults. Since 1978, the intake of saturated fat, total fat, and cholesterol among the general public decreased significantly, resulting in an impressive decline in average blood cholesterol levels. The prevalence of high blood cholesterol in the U.S. population has also fallen significantly. Cholesterol levels in adolescents likewise have declined.

In 2001, the NCEP issued new "Adult Treatment Panel III (ATP III) Guidelines" on prevention and management of high cholesterol in adults. The "ATP III Guidelines" stress the need for aggressive cholesterol lowering in individuals at high risk for coronary heart disease and provides an effective set of lifestyle changes for treating high blood cholesterol. To educate and encourage professionals, patients, and the public about the need to lower blood cholesterol, the NCEP updated its "Live Healthier, Live Longer" Web page with information that will help individuals follow the new "ATP III Guidelines." The NCEP also added the 2001 National Cholesterol Education Month Kit to its site.

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, prevent disruptions of daily routine, limit hospitalizations, and reduce deaths caused by uncontrolled asthma.

The dissemination and implementation of national guidelines on the diagnosis and management of asthma are major priorities. The NAEPP has created partnerships with local asthma coalitions to stimulate grassroots programs, particularly in underserved, high-risk communities that are disproportionately affected by asthma. By adopting this approach, the NHLBI can bring treatment interventions into multiple settings, including physicians' offices, community clinics, schools, homes, child care centers, and other local organizations.

In FY 2001, in response to a congressional directive, the NHLBI through the NAEPP Coordinating Committee and the Federal Liaison Group on Asthma prepared a report that identifies all Federal programs supporting asthma-related activities, outlines a Federal plan for responding to asthma, and makes recommendations to Congress on ways to strengthen and improve the coordination of asthma-related activities of the Federal Government.

The National Heart Attack Alert Program (NHAAP) was initiated in June 1991 to reduce morbidity and mortality from MI, including out-of-hospital cardiac arrest, through education of health 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. Available treatments, if administered soon after heart attack symptoms start, can reduce the number of people who die from a heart attack and can minimize heart muscle damage in heart attack survivors. Since its inception, a major focus of the program has been to educate health care providers in emergency

departments and emergency medical services systems about the importance of reducing the interval between a heart attack and treatment. Progress has been made in decreasing the time from patient arrival to onset of treatment—from 60 minutes in 1990 to 34 minutes in 1999.

In 2001, the NHAAP, in partnership with the American Heart Association, the American Red Cross, and the National Council on Aging, launched a major campaign to urge physicians and health care providers to educate their patients about heart attack risk, warning signs, and survival. As part of the campaign to increase awareness of the need to act fast when someone may be having a heart attack, the NHLBI established its "Act in Time to Heart Attack Signs" Web page with educational materials for health professionals, patients, and the public.

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

The OEI continues to disseminate various products based on the "Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: Evidence Report" to health professionals. It introduced new tools—a practical guide to help health care providers manage the treatment of their overweight and obese patients, an online interactive menu planner, and consumer tips on behavioral change for weight management for health care providers and the public to combat overweight and obesity. These tools can be found on the NHLBI's "Aim for a Health Weight" Web site.

In FY 2001, the NHLBI Hearts N' Parks project was expanded to include approximately 50 at-risk communities in 10 States with high prevalence of CVD. The goal is to create model community-based programs to increase the number of children, adults, and seniors practicing heart-healthy behaviors in order to reduce obesity, improve nutritional status, and increase physical activity.

The NHLBI Women's Heart Health Education Initiative was launched this year in response to the Women's Health Research and Prevention Amendments, Public Law 105-304, which requires the Institute Director "to expand, intensify, and coordinate research and related activities, including information and educational programs with respect to heart attack, stroke, and other cardiovascular diseases in women." The Institute held a strategy development workshop, "Women's Heart Health: Developing a National Health Education Action Plan," to plan an agenda for the new health education effort. As a result of the recommendations of the workshop, the Institute awarded a 3-year contract for planning and implementing a comprehensive public awareness and professional education program on women's heart health.

As a key part of the NHLBI's response to the Healthy People (HP) 2010 Objectives for the Nation, the Institute initiated a new funding mechanism to support the establishment and conduct of CVD educational outreach programs in high-risk communities. The program—Enhanced Dissemination and Utilization Center (EDUC)—is dedicated to the elimination of cardiovascular health disparities in underserved populations. In FY 2001, the Institute awarded EDUCs to high-risk health service areas in Arkansas, North Carolina, Texas, Virginia, and West Virginia to conduct educational projects to prevent and control CVD risk factors and to promote heart-healthy behavior.

The NHLBI Ad Hoc Committee on Minority Populations was established in 1975 to facilitate communication between minority communities and the NHBPEP. Its role has since expanded as the Institute developed new educational and prevention programs. The Committee includes health professionals from diverse cultural backgrounds with broad-based expertise in a variety of areas. Representing blacks, Hispanics, American Indians, Alaska Natives, Asian Americans, and Pacific Islanders, the Committee provides important input on NHLBI's minority initiatives.

A major goal of the Institute is to eliminate health disparities and to increase the quality and years of healthy life of all Americans. Through partnerships with groups that have special ties and access to targeted populations, the NHLBI is extending its outreach and educational activities to underserved communities. The Baltimore City Cardiovascular Health Partnership was formed to promote cardiovascular health in black communities. The project has a two-pronged strategy that consists of a population-wide public education campaign and a targeted subgroup outreach and educational approach to build and reinforce positive cardiovascular health lifestyle skills and behaviors. The respective population

targets are blacks residing in Baltimore City and blacks living in the Baltimore City public housing development.

A second project, Salud para su Corazón (Health for Your Heart), is a community-driven cardiovascular health program to promote heart health in Latino communities. Trained local lay health workers (promotores) take an active role in delivering heart health messages. Now in its seventh year, the project is making a difference in Latino families in underserved communities of Texas, Illinois, New Mexico, Rhode Island, and California.

A third project, the NHLBI-Indian Health Service (IHS) Partnership To Strengthen the Heartbeat of American Indian (AI) and Alaska Native (AN) Communities, was created to educate three tribal communities—Ponca Tribe of Oklahoma, Bristol Bay Area in Western Alaska, and Laguna Pueblo in New Mexico—about cardiovascular health and to reduce their risk for CVD. Significant tribal input was sought during the planning processes, and the subsequent cardiovascular health action plan has been tailored specifically for them. Recently selected tribal heart health teams will begin to implement the cardiovascular health education and outreach activities in the first quarter of FY 2002.

A fourth project is directed to Asian Americans and Pacific Islanders, a diverse and heterogeneous group with varying levels of CVD risk factors, acculturation, and socioeconomic status and with different cultures, languages, immigration history, and community norms related to health and well-being. The NHLBI is conducting ethnic-specific health assessments among Filipino, Vietnamese, Cambodian, Hmong, and Samoan groups to obtain information on their knowledge of and attitudes toward heart disease and its risk factors, as well as the need for heart disease prevention messages. Before developing culturally and linguistically appropriate health messages and tools for this heterogeneous group, the Institute must determine ethnicity-specific perceptions of heart health and barriers to adopting heart-healthy behavior among the various groups. The assessments will be used to develop appropriate steps to be taken to promote heart-healthy behaviors.

International Activities

In addition to having national programs, the Institute is also a world leader in research and policy development in heart, lung, and blood diseases and blood resources. Through its international programs, the NHLBI is contributing to and tapping into the rapidly developing global knowledge base in medicine, science, and technology related to its mission. The Institute's international activities are conducted through multiple mechanisms, including government-to-government and institute-to-institute agreements, joint research projects, joint symposia and workshops, joint documents and publications, scientist exchanges, grants, contracts, and fellowships. In addition, the Institute is providing training to international research fellows from approximately 35 countries in its laboratories.

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

The NHLBI continues to contribute to worldwide health plans by working closely with international organizations. In August 2000, the Institute director began a 5-year term as president of the World Hypertension League (WHL). The director and members of the NHLBI staff serve as consultants to the Pan American Health Organization (PAHO), the Global Initiative on Asthma, the Initiative on Global Obstructive Lung Disease, and the World Health Organization (WHO). The Institute serves as a WHO Collaborating Center for Cardiovascular Research and Training for the Americas.

At the regional level, the NHLBI is addressing the pandemic of CVD in North, Central, and South America and the Caribbean through support of the Pan American Hypertension Initiative (PAHI), a public/private partnership initiated by the NHLBI and the PAHO in collaboration with seven international scientific organizations—the World Heart Federation, the Inter-American Heart Foundation, the Inter-American Society of Cardiology, the Inter-American Society of Hypertension, the Pan American Network of CARMEN Programs, the Latin American Society of Nephrology and Hypertension, and the WHL. The initiative seeks to reduce morbidity and mortality from CVD by controlling hypertension, a major risk factor for the disease, in an estimated 40 million people who already have the condition and by preventing it in millions more at risk because of their unhealthy lifestyles. Significant reductions in the sequelae of heart attacks, stroke, heart failure, and premature deaths are expected to result from the PAHI.

The major international activities that occurred in FY 2001 included the 20th Anniversary Meeting of Cooperation in Cardiovascular and Cardiopulmonary Epidemiology between the NHLBI and research institutes in North and South China; the United States-Russia Cardiac Arrhythmia Symposium between the NHLBI and the Cardiovascular Research Institute in Moscow, Russia; and the United States-Japan Symposium on Genetic Epidemiology between the NHLBI and the National Cardiovascular Center in Osaka, Japan.

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

3. Important Events

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

October 16, 1968. Dr. Marshall W. Nirenberg is awarded a Nobel Prize in physiology 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 anniversaries.

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

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

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

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

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

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

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

September 1982. The results of the Multiple Risk Factor Intervention Trial are released. They support 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. In NHLBI-NIH Clinical Center interagency agreement for studies on the transmission of human immunodeficiency virus (HIV) from humans to chimpanzees leads to the first definitive evidence that the transmission is by blood transfusion.

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

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

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

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

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

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

September 1987. The NHLBI commemorates the centennial of the NIH and the 40th anniversary of the Institute's inception. Two publications prepared for the Institute's anniversary, *Forty Years of Achievement in*

Heart, Lung, and Blood Research and *A Salute to the Past: A History of the National Heart, Lung, and Blood Institute,* document significant Institute contributions to research and summarize recollections about the Institute's 40-year history.

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

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

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

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

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

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

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

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

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

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

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

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

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

June 11, 1991. The NHLBI initiates a National Heart Attack Alert Program (NHAAP) to reduce premature morbidity and mortality from acute MI and sudden death. The Program emphasizes rapid disease identification and treatment.

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

August 1991. Results of the Studies of Left Ventricular Dysfunction (SOLVD) are released. They demonstrate that use of the 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.

June 10, 1993. The NIH Revitalization Act of 1993 (P.L. 103-43) establishes the National Center on Sleep Disorders Research within the NHLBI.

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

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

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

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

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

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

May 21, 1996. The NHLBI announces results from the Framingham Heart Study that conclude earlier and more aggressive treatment of hypertension is vital to preventing congestive heart failure. Lifestyle changes, such as weight loss, a healthy eating plan, and physical activity, are crucial for reducing blood lipids in those treated for Stage I hypertension.

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

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

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

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

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

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

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

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

October 1, 1997. The Women's Health Initiative, initiated in 1991, is transferred to the NHLBI.

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

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

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

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

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

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

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

March 1999. The Acute Respiratory Distress Syndrome (ARDS) Network Study of Ventilator Management in ARDS is stopped early so that critical care specialists can be alerted to the results. The study demonstrated that approximately 25 percent fewer deaths occurred among intensive care patients with ARDS receiving small, rather than large, breaths of air from a mechanical ventilator.

March 22, 1999. The NAEPP holds its 10th anniversary meeting and celebration to recognize a decade of progress and a continued commitment to the future.

August 1999. Results of the Early Revascularization for Cardiogenic Shock are released. They show improved survival at 6 months in patients treated with balloon angioplasty or coronary bypass surgery compared with patients who receive intensive medical care to stabilize their condition.

September 27-29, 1999. The NHLBI sponsors the National Conference on Cardiovascular Disease Prevention: Meeting the Healthy People 2010 Objectives for Cardiovascular Health.

November 2, 1999. The NAEPP convenes a Workshop on Strengthening Asthma Coalitions: Thinking Globally, Acting Locally to gather information from coalition representatives on ways the NAEPP could support their efforts.

November 2-3, 1999. The NHLBI sponsors a Workshop on Research Training and Career Development.

March 8, 2000. A part of the Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT) is terminated early because one of the tested drugs, an alpha-adrenergic blocker, was found to be less effective than the more traditional diuretic in reducing some forms of CVD.

March 29, 2000. The NHLBI launches the Web-based Healthy People 2010 Gateway to provide information and resources on cardiovascular health, asthma, sleep, and minority populations.

April 25, 2000. The NHLBI sponsors a special expert meeting, Scientific Frontiers in Cardiothoracic Surgery, to discuss the future of cardiothoracic research.

September 2000. NHLBI-supported investigators identify a gene for primary pulmonary hypertension.

January 2001. Results of the DASH-Sodium Trial are released. They show that dietary sodium reduction substantially lowers blood pressure in persons with high blood pressure; the greatest effect occurs when sodium reduction is combined with the DASH diet.

February 2001. The NHLBI launches a sleep education program for children, using star sleeper Garfield the Cat.

March 26-27, 2001. A strategy development workshop, "Women's Heart Health: Developing a National Health Education Action Plan," is held to develop an agenda for the NHLBI's new heart health education effort directed at women.

April 2001. The NHLBI releases the international guidelines for diagnosis, management, and prevention of COPD.

April 2001. NHLBI-supported investigators identify genes that regulate human cholesterol levels.

May 2001. The NHLBI releases the NCEP's new Adult Treatment Panel III (ATP III) guidelines for the detection, evaluation, and treatment of high blood cholesterol in adults.

July 2001. A self-contained artificial heart is implanted in a patient for the first time.

August 2001. Early results from the National Emphysema Treatment Trial identify characteristics of patients at high risk for death following lung volume reduction surgery.

August 2001. Scientists from the NHLBI SCOR program at Yale University identify two genes responsible for pseudohypoaldosteronism type II, a rare Mendelian form of high blood pressure. These genes encode for protein kinases involved in a previously unknown pathway and may provide new targets for therapy.

November 2001. Results of the Randomized Evaluation of Mechanical Assistance for the Treatment of Chronic Heart Failure Trial demonstrate that using a wearable left ventricular assist device can prolong survival and improve quality of life in severely ill patients who are not candidates for heart transplantation.

4. Disease Statistics

Cardiovascular, lung, and blood diseases constitute a large morbidity, mortality, and economic burden on individuals, families, and the Nation. Common forms are atherosclerosis, hypertension, COPD, and blood-clotting disorders—embolisms and thromboses. The most serious atherosclerotic diseases are CHD, as manifested by heart attack and angina pectoris, and cerebrovascular disease, as manifested by stroke.

In 1999, cardiovascular, lung, and blood diseases accounted for 1,187,000 deaths and 50 percent of all deaths in the United States (p. 37). The projected economic cost in 2002 for these diseases is expected to be $456 billion, 23 percent of the total economic costs of illness, injuries, and death (p. 52). Of all diseases, heart disease is the leading cause of death, cerebrovascular disease is third (behind cancer), and COPD (including asthma) ranks fourth (p. 40). Cardiovascular and lung diseases account for three of the five leading causes of death (p. 40) and four of the five leading causes of infant death (p. 46). Hypertension, heart disease, asthma, and chronic bronchitis are especially prevalent and account for substantial morbidity in Americans (p. 48). Increases in prevalence have been greatest for asthma and congestive heart failure (CHF).

The purpose of the biomedical research conducted by the NHLBI is to contribute to the prevention and treatment of cardiovascular, lung, and blood diseases. National disease statistics show that by mid-century, morbidity and mortality from these diseases had reached record high levels. Since then, however, substantial improvements have been achieved, especially over the past 30 years, as shown by the significant decline in mortality rates. Because many of these diseases begin early in life, their early detection and control can reduce the risk of disability and can delay death. Although important advances have been made in the treatment and control of cardiovascular, lung, and blood diseases, these diseases continue to be a major burden on the Nation.

Cardiovascular Diseases

- In 1999, CVD caused 959,000 deaths—40 percent of all deaths (p. 37).
- Heart disease is the leading cause of death; the main form, CHD, caused 529,000 deaths in 1999 (pp. 38, 40).
- The annual number of deaths from CVD increased substantially between 1900 and 1970 (p. 39). 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 1968. By 1995, the rate achieved was similar to the rate in 1936 (p. 39).
- Cerebrovascular disease, the third leading cause of death, accounted for 167,000 deaths in 1999 (pp. 38, 40).
- Heart disease is second only to all cancers combined in years of potential life lost (p. 40).
- Among minority groups, heart disease ranks first, and stroke ranks fifth or higher as the leading causes of death (p. 40).
- The 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. 39, 41).
- The rapid increase in deaths due to CHF between 1968 and 1999 is a major exception to the mortality decline in CVD (p. 41).
- Between 1985 and 1999, death rates for heart disease and stroke declined for men and women in all racial/ethnic groups (p. 42).
- Because of the rapid decline in mortality from CHD since the peak in 1968, there were 778,000 fewer deaths from CHD in 1999 than would have occurred if there had been no decline (p. 43).

- Substantial improvements have been made in the treatment of CVD. Since 1975, case-fatality rates from hospitalized AMI, stroke, cardiac dysrhythmia, and CHF patients declined appreciably (p. 43).
- The decline in CHD mortality began earlier in the United States than in most countries and outpaced that in most countries (only selected countries are shown) (p. 44).
- Between 1990 and 2000, the percent decline in death rates for CHD was greatest among white males and least among black females (p. 45).
- In 1999, an estimated 61.8 million persons in the United States had some form of CVD; 50 million had hypertension, and almost 13 million had CHD (p. 48).
- Since the 1960s, there has been a substantial reduction in the prevalence of CVD risk factors: hypertension, smoking, and high cholesterol, but not overweight (p. 49).
- A 1988–94 national survey showed that many more people with hypertension (systolic BP > 160 mmHg or diastolic BP > 95 mmHg or on antihypertensive medication) were aware of their condition and had it treated and controlled compared with individuals with hypertenson in previous years (p. 50).
- A 1991–94 national survey showed only 27 percent of hypertensive patients (systolic BP > 140 mmHg or diastolic BP > 90 mmHg or on antihypertensive medication) had their condition under control (p. 50).
- Hospitalization rates for CHF increased between 1971 and 1999 (p. 51).
- The estimate of economic cost of CVD is expected to be $329 billion in 2002:
  - $199 billion in direct health expenditures
  - $31 billion in indirect cost of morbidity
  - $99 billion in indirect cost of mortality (p. 52).

Lung Diseases

- Lung diseases, excluding lung cancer, caused an estimated 231,000 deaths in 1999 (p. 37).
- COPD caused 119,000 deaths in 1999 and is the fourth leading cause of death (pp. 38, 40).
- Between 1990 and 2000, death rates for COPD increased substantially in women and decreased slightly in men; mortality for asthma increased in black women but decreased in white women and in men (p. 45).
- Between 1980 and 2000, infant death rates for various lung diseases declined markedly (p. 45).
- Of the five leading causes of infant mortality, four are lung diseases or have a lung disease component (p. 46). Between 1989 and 1999, changes in mortality for the causes were:
  - Congenital anomalies (-24 percent)
  - Disorders of short gestation (+3 percent)
  - Sudden infant death syndrome (SIDS) (-54 percent)
  - Respiratory distress syndrome (RDS) (-70 percent).
- Lung diseases accounted for 20 percent of all deaths under 1 year of age in 1999 (p. 46).
- Trends in COPD mortality in the United States are increasing rapidly in women and are flat for men. The death rate for women in the United States is increasing significantly compared with the rates in several other countries (p. 47).
- Asthma is a common chronic condition, particularly in children (pp. 48, 49, 51).
- Asthma and emphysema are leading chronic conditions causing limitation of activity (not shown). Asthma is the fourth leading chronic condition causing bed disability days.
- The economic cost of lung diseases is expected to be $116 billion in 2002—$65 billion in direct health expenditures and $51 billion in indirect cost of morbidity and mortality (p. 52).

Blood Diseases

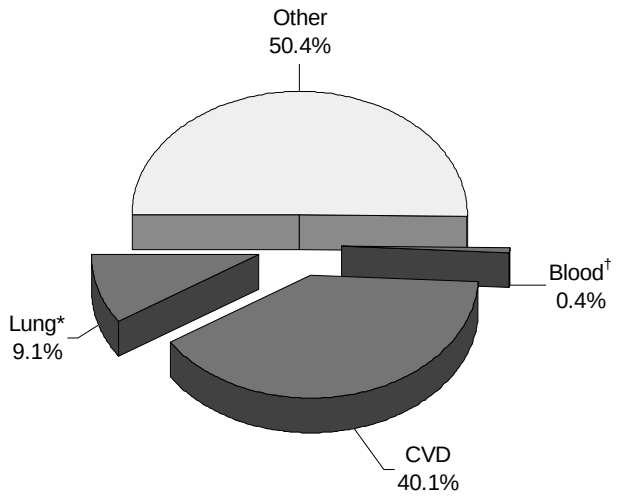
- An estimated 268,000 deaths, 11 percent of all deaths, were attributed to blood diseases in 1999. These include the following:
  - 258,000 due to blood-clotting disorders
  - 10,000 to diseases of the red blood cell and bleeding disorders (p. 38).
- A large proportion of deaths from acute MI and cerebrovascular disease involve blood-clotting problems (p. 38). Mortality trends are downward (p. 37).
- In 2002, blood-clotting disorders are expected to cost the nation's economy $77 billion, and other blood diseases will cost $10 billion (p. 52).
- The mean age at death for persons with sickle cell anemia increased from about 28 years in 1979 to 35.9 years in 1999 (not shown).
- Each year, an estimated 14 million units of blood are collected from 8 million donors and transfused to about 4.5 million patients (not shown).

Deaths From All Causes and Deaths From Cardiovascular, Lung, and Blood Diseases, U.S., 1979 and 1999

Cause of Death	1979 Number of Deaths	1979 Percent of Total	1999 Number of Deaths	1999 Percent of Total
All Causes	1,914,000	100	2,391,000	100
All Cardiovascular, Lung, and Blood Diseases	1,105,000	58	1,187,000	50
Cardiovascular Diseases	970,000	51	959,000	40
Blood	345,000*	18	268,000†	11
Lung	140,000‡	7	231,000‡	10
All Other Causes	809,000	42	1,204,000	50

* Includes 339,000 CVD deaths involving blood clotting.
† Includes 258,000 CVD deaths involving blood-clotting disease.
‡ Includes 11,000 CVD deaths due to pulmonary heart disease in 1979 and 13,000 in 1999.
Source: Vital Statistics of the United States, National Center for Health Statistics (NCHS).

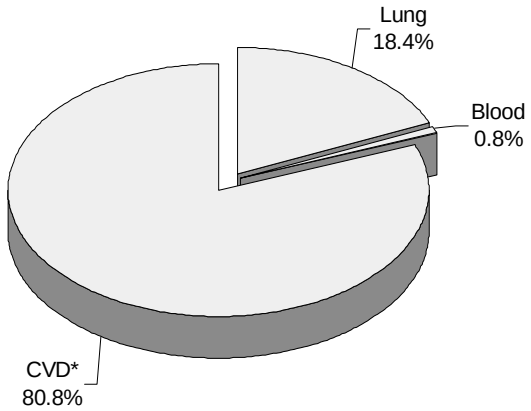
Deaths by Major Causes, U.S., 1999



Total Cardiovascular, Lung, and Blood Diseases 49.6%

* Excludes deaths from pulmonary heart disease.
† Excludes deaths from blood-clotting disorders and pulmonary embolism (10.4%).

Deaths From Cardiovascular, Lung, and Blood Diseases, U.S., 1999



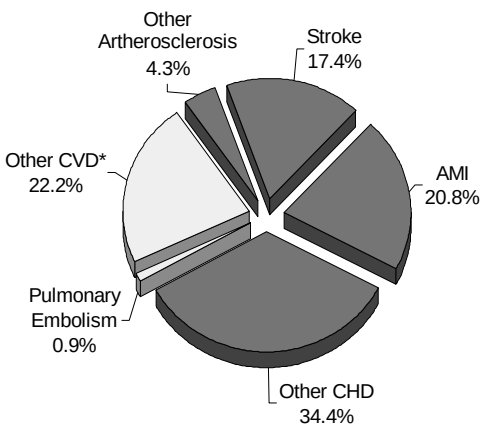
* CVD involving blood clotting (21.7%).
Note: Numbers may not add to total due to rounding.

Deaths From Specific Cardiovascular, Lung, and Blood Diseases, U.S., 1999

Cause of Death	Deaths (Thousands)		
	Cardiovascular	Lung	Blood
Acute Myocardial Infarction	199	—	138*
Other Coronary Heart Disease	330	—	—
Cerebrovascular Diseases (Stroke)	167	—	108*
Other Atherosclerosis	41	—	3*
Pulmonary Embolism	9	9*	9*
Other Cardiovascular Diseases	213	4*	—
Bleeding and Red Blood Cell Diseases	—	—	10
Chronic Obstructive Pulmonary Disease	—	119	—
Asthma	—	5	—
Other Airway Diseases	—	1	—
Pneumonia	—	62	—
Neonatal Pulmonary Disorders	—	6	—
Interstitial Lung Diseases	—	5	—
Lung Diseases Due to External Agents	—	16	—
Other Lung Diseases	—	4	—
Total	**959**	**231**	**268**

* Deaths from clotting or pulmonary disorders are included also as cardiovascular deaths.
Note: Total, excluding overlap, is 1,187,000.
Source: Estimated by the NHLBI from Vital Statistics of the United States, NCHS.

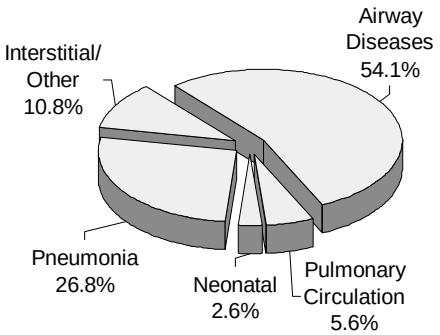
Deaths From Cardiovascular Diseases, U.S., 1999



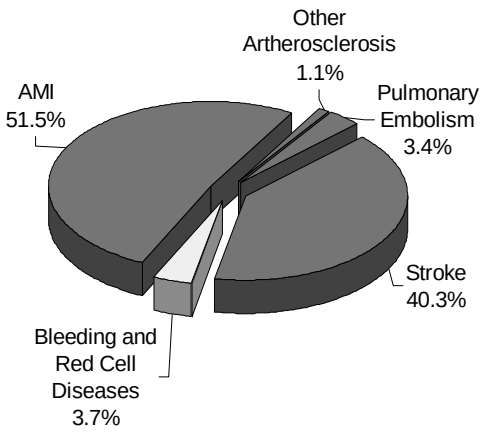
Atherosclerosis-Related Disease 76.9%

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

Deaths From Lung Diseases, U.S., 1999



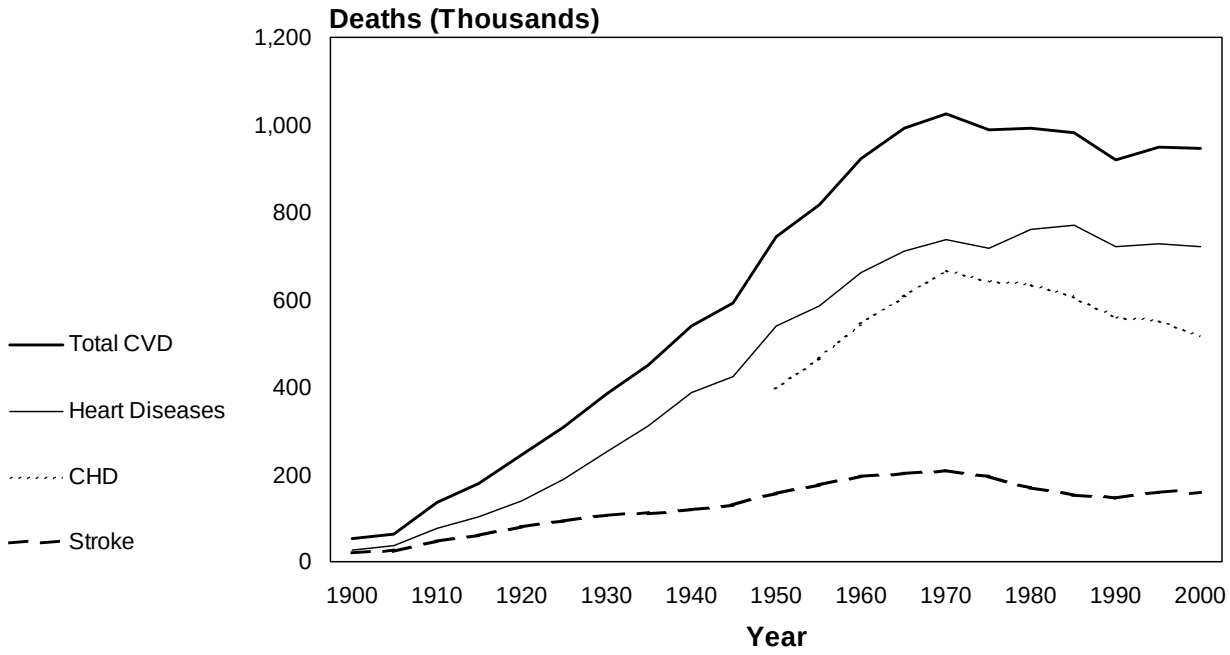
Deaths From Blood Diseases, U.S., 1999



Blood-Clotting Disorders 96.3%

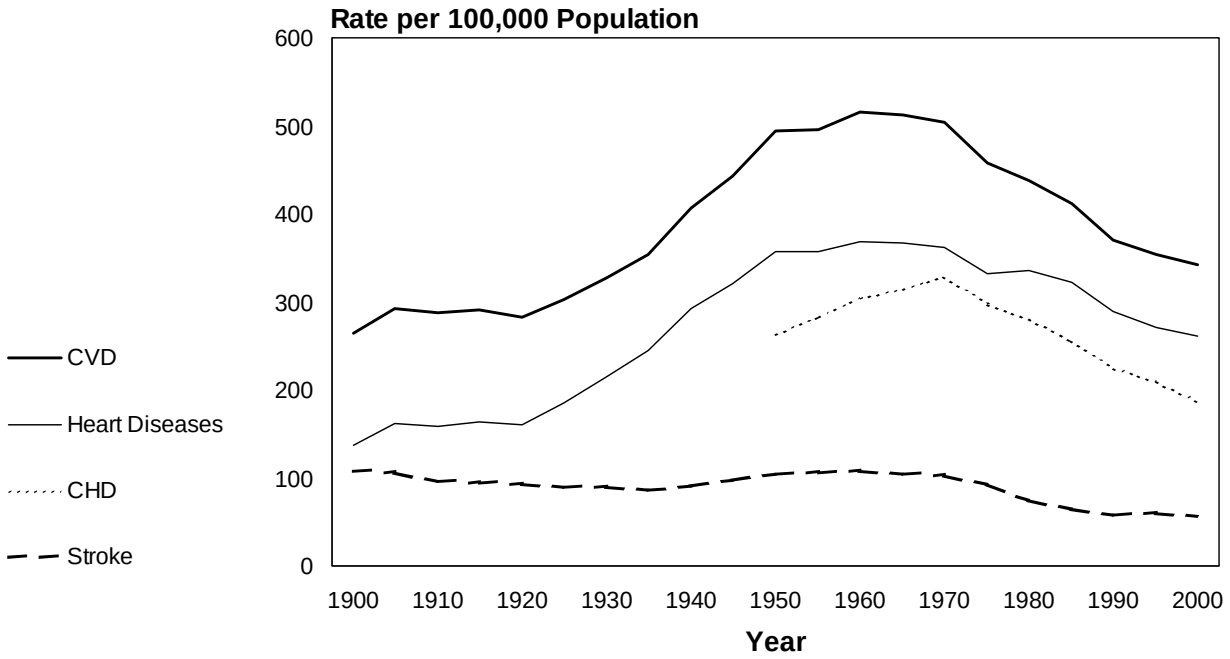
Note: Numbers may not add to total due to rounding.
Source: Estimated by the NHLBI from Vital Statistics of the United States, NCHS.

Deaths From Cardiovascular Diseases, U.S., 1900-2000



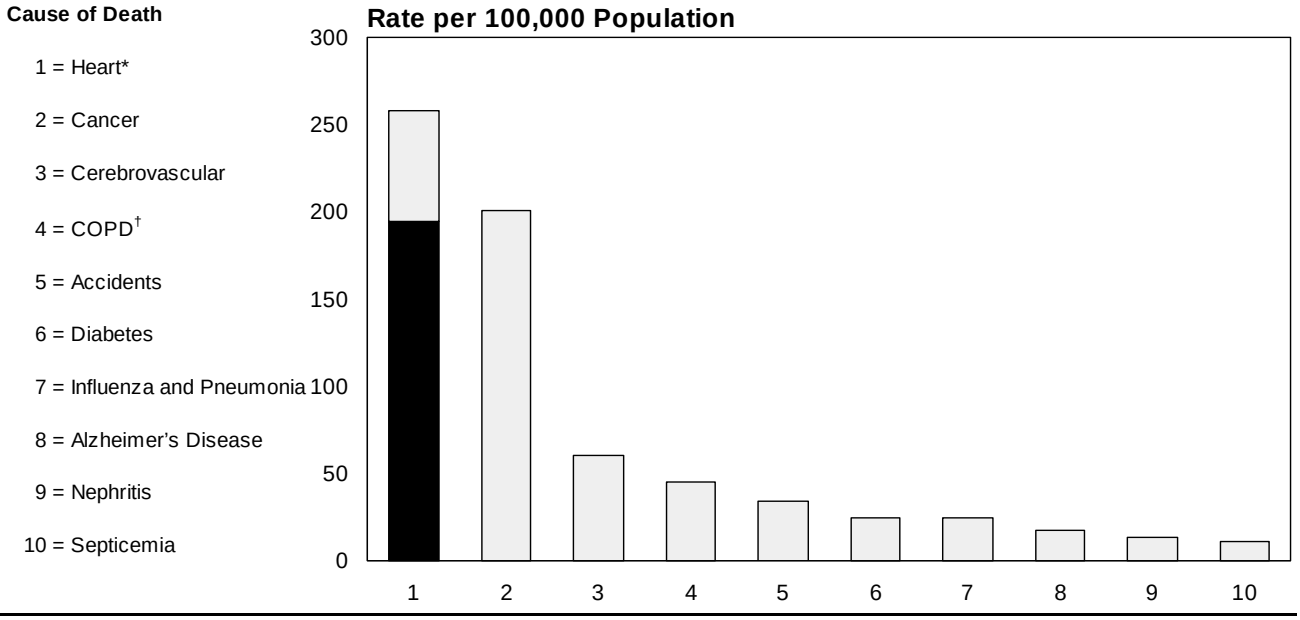
Source: Vital Statistics of the United States, NCHS.

Death Rates* for Cardiovascular Diseases, U.S., 1900-2000



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

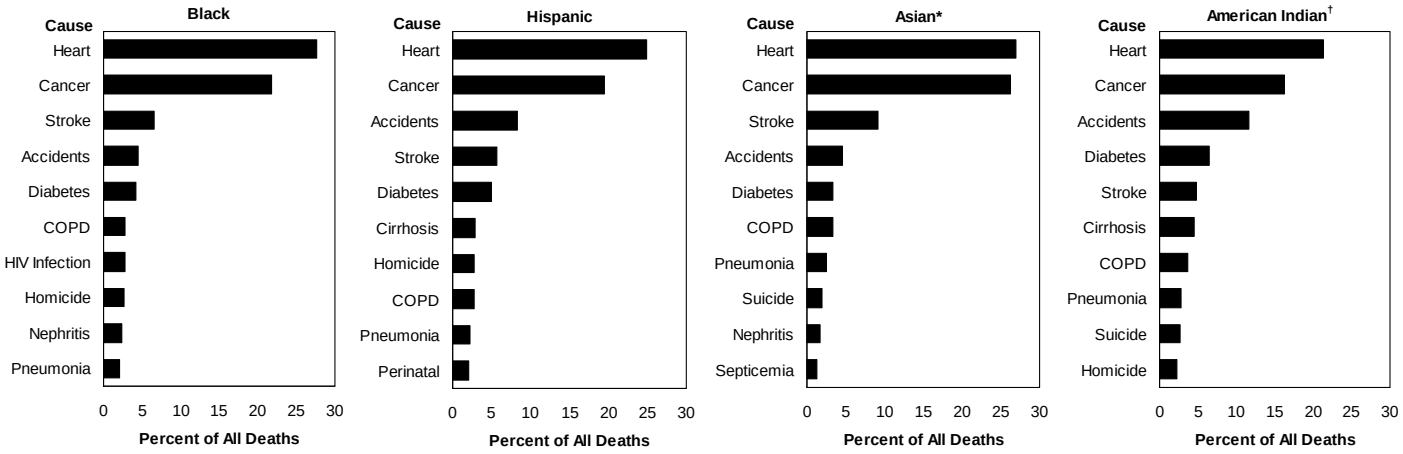
Ten Leading Causes of Death: Death Rates, U.S., 2000



	1	2	3	4	5	6	7	8	9	10
Years of potential life lost (millions)‡	3.3	4.4	0.6	0.5	2.7	0.5	0.2	<0.1	0.2	0.2

* Includes 194.2 deaths per 100,000 population from CHD.
† COPD and allied conditions (including asthma); the term in the ICD/10 is "chronic lower respiratory diseases."
‡ Based on the average remaining years of life up to age 75 years.
Source: Vital Statistics of the United States, NCHS (preliminary).

Ten Leading Causes of Death Among Minority Groups, U.S., 1999



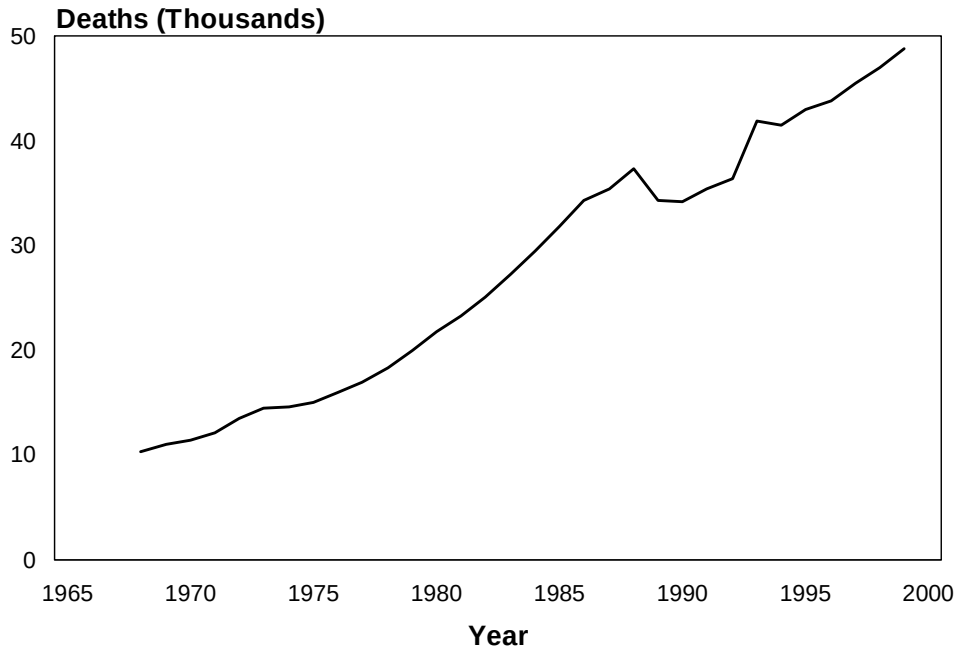
* Includes deaths among individuals of Asian extraction and Asian-Pacific Islanders.
† Includes deaths among Aleuts and Eskimos.
Source: Vital Statistics of the United States, NCHS.

Death Rates* for Cardiovascular and Noncardiovascular Diseases, U.S., 1980 and 2000

Cause of Death	Rate* 1980	Rate* 2000†	Rate Change	Percent Change
All Causes	1,039	872	-167	-16
Cardiovascular Diseases	544	341	-203	-37
Coronary Heart Disease	345	187	-158	-46
Stroke	96	57	-39	-41
Other	103	97	-6	-6
Noncardiovascular Diseases	495	531	36	7

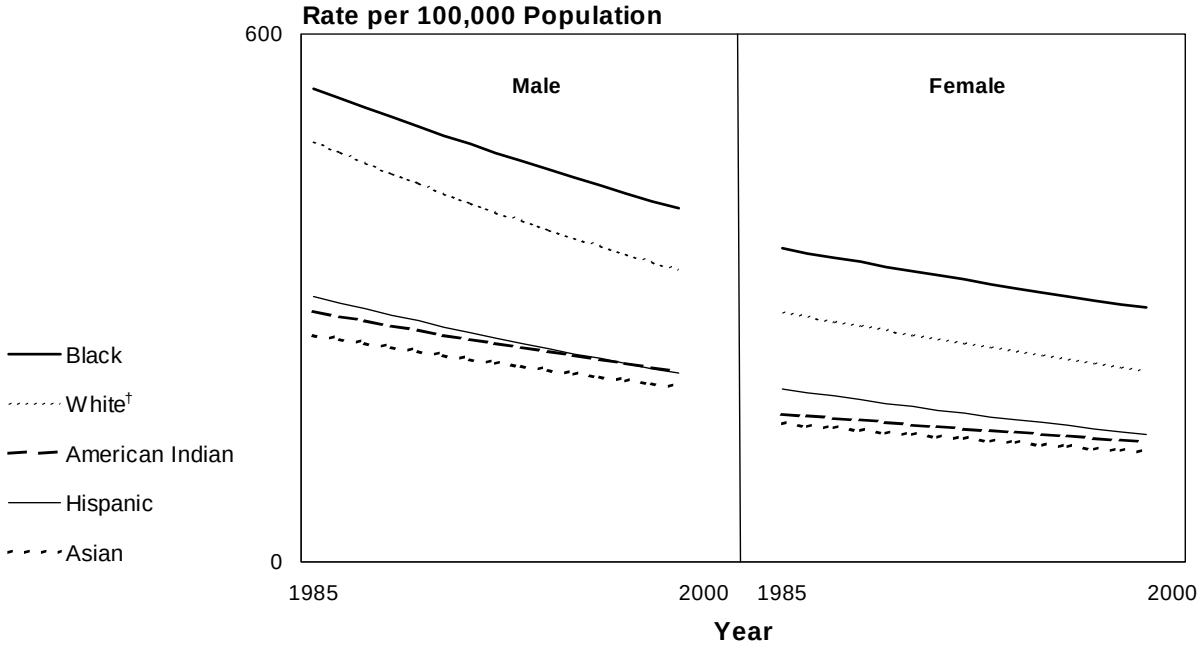
* Age-adjusted; rate per 100,000 population.
† Data for 2000 are preliminary or estimated by the NHLBI.
Note: Numbers may not add to totals due to rounding.
Source: Vital Statistics of the United States, NCHS.

Deaths From Congestive Heart Failure, U.S., 1968-99



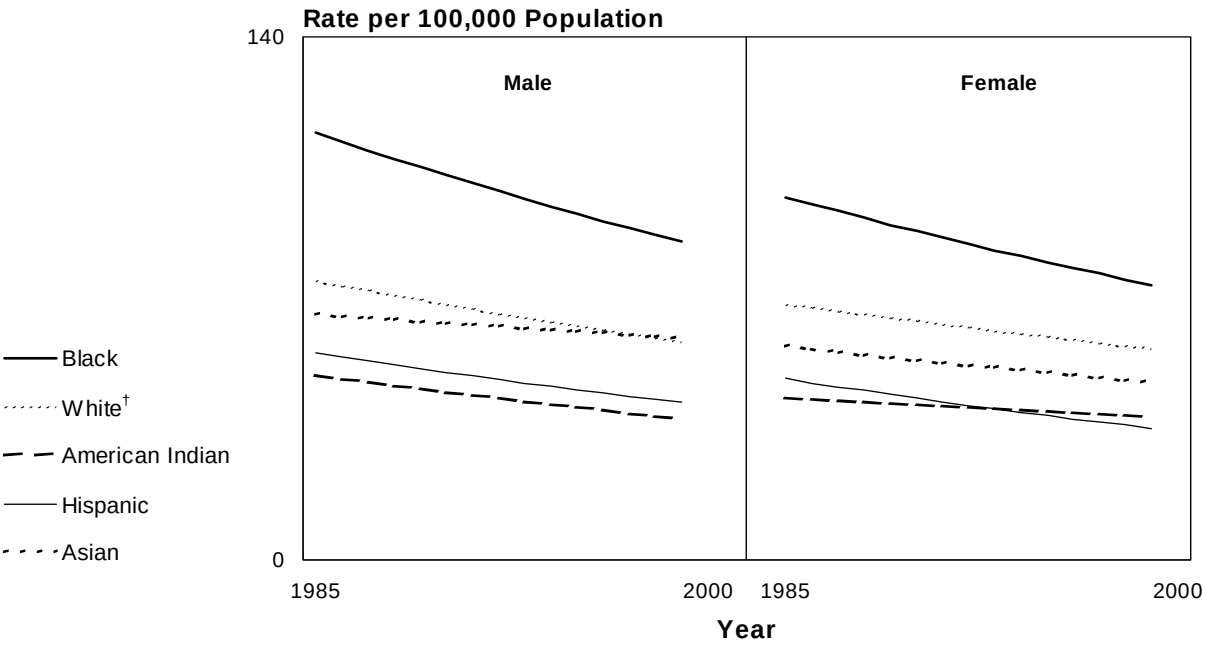
The sharp drop occurring in 1989 is attributed to the revision of the death certificate.
Source: Vital Statistics of the United States, NCHS.

Death Rates* for Heart Disease by Gender, Race, and Ethnicity, U.S., 1985-99



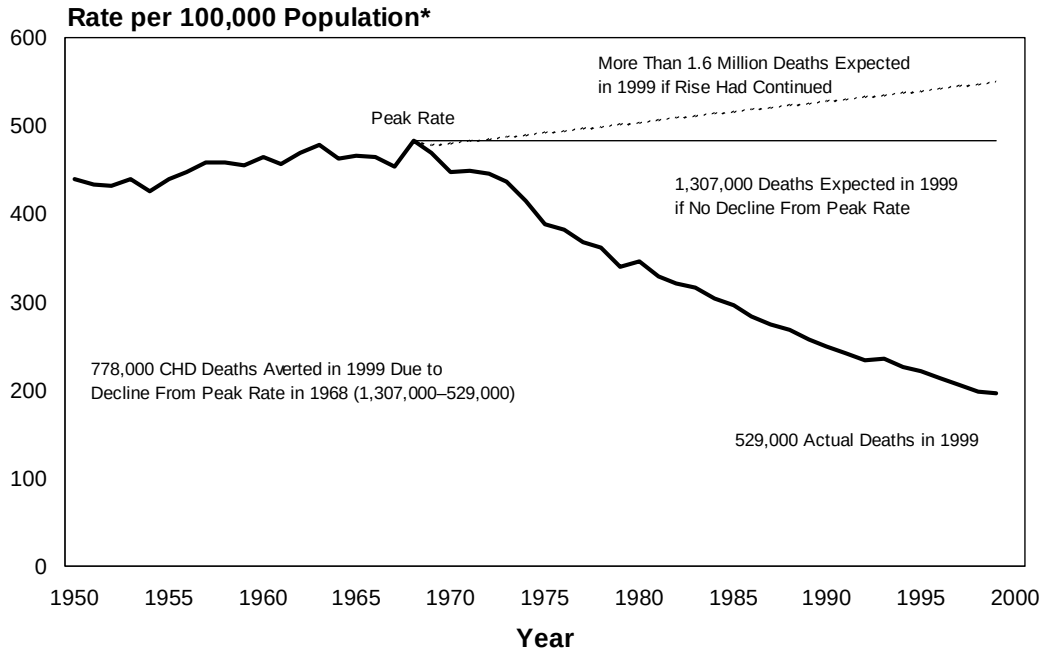
* Age-adjusted.
† Non-Hispanic.
Note: Each line is a log linear regression derived from the actual rates.
Source: Vital Statistics of the United States, NCHS.

Death Rates* for Stroke by Gender, Race, and Ethnicity, U.S., 1985-99



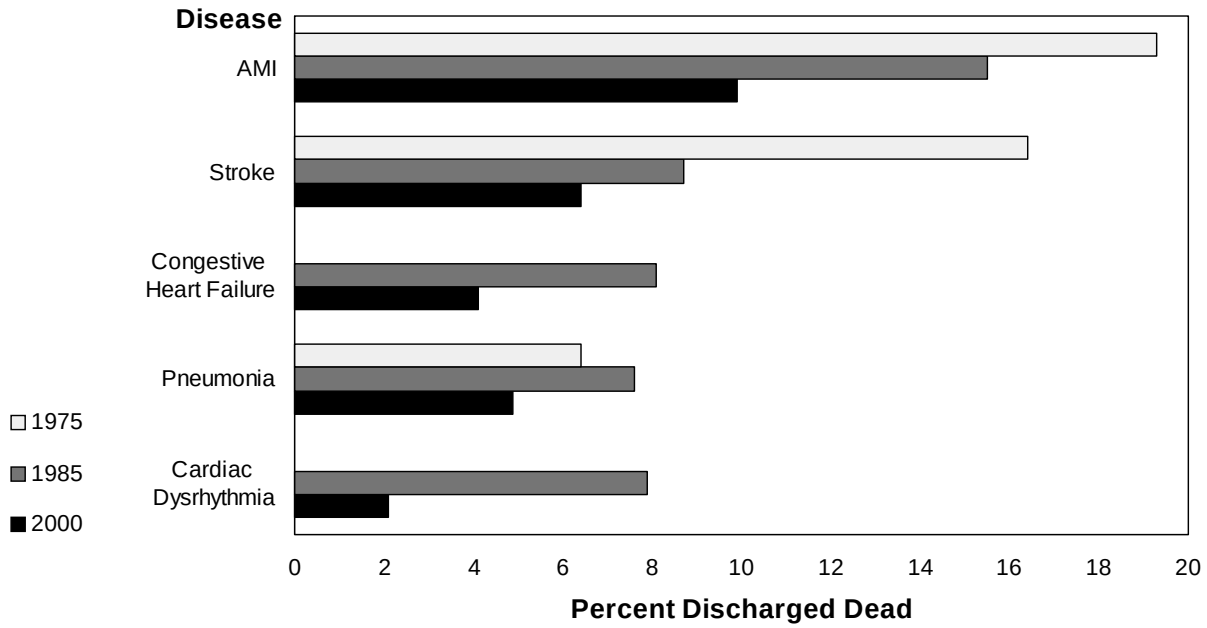
* Age-adjusted.
† Non-Hispanic.
Note: Each line is a log linear regression derived from the actual rates.
Source: Vital Statistics of the United States, NCHS.

Death Rates for Coronary Heart Disease, U.S., 1950-99
Actual Rate and Expected Rates if Rise Had Continued or Reached a Plateau



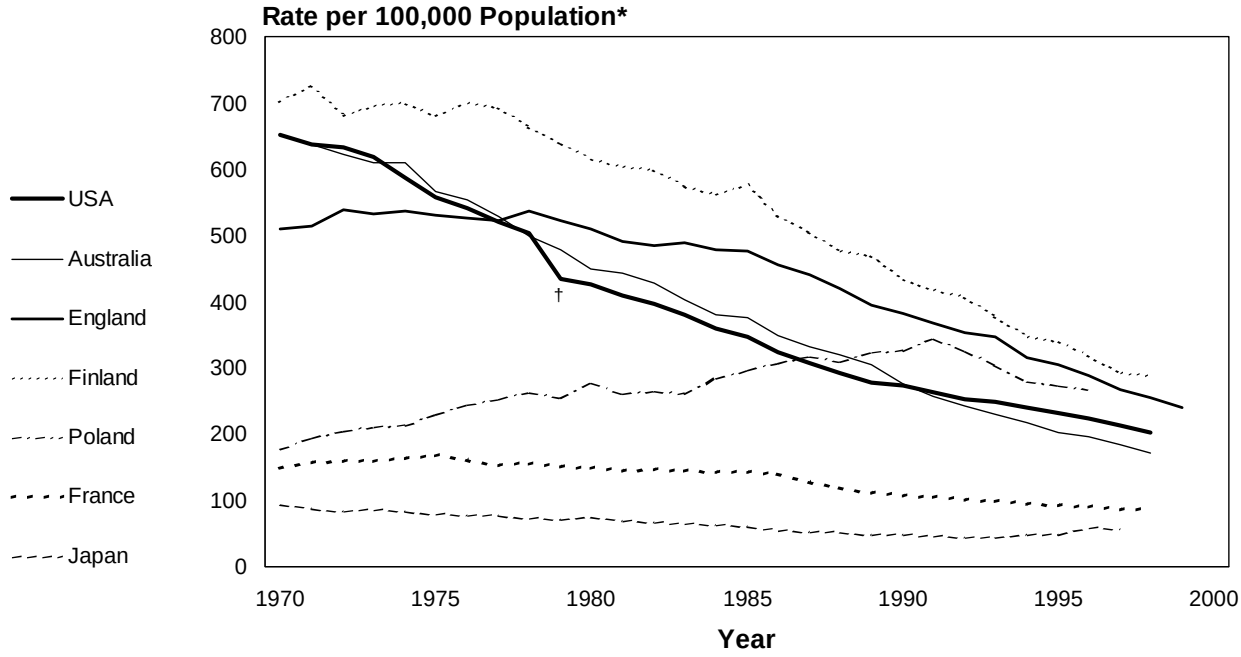
* Age adjusted.
Source: Vital Statistics of the United States, NCHS.

Common Cardiovascular and Lung Diseases With High Percentage Discharged Dead From Hospitals, U.S., 1975, 1985, and 2000



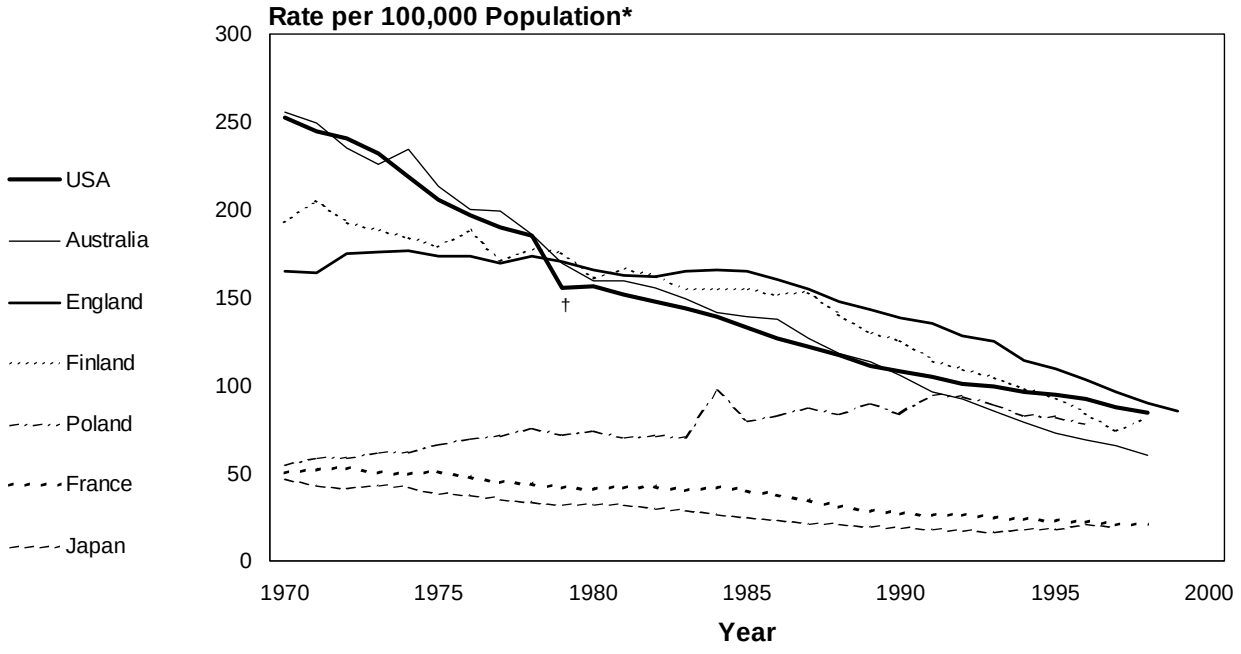
Source: National Hospital Discharge Survey, NCHS.

Death Rates for Coronary Heart Disease in Men Ages 35-74 Years, Selected Countries, 1970-99



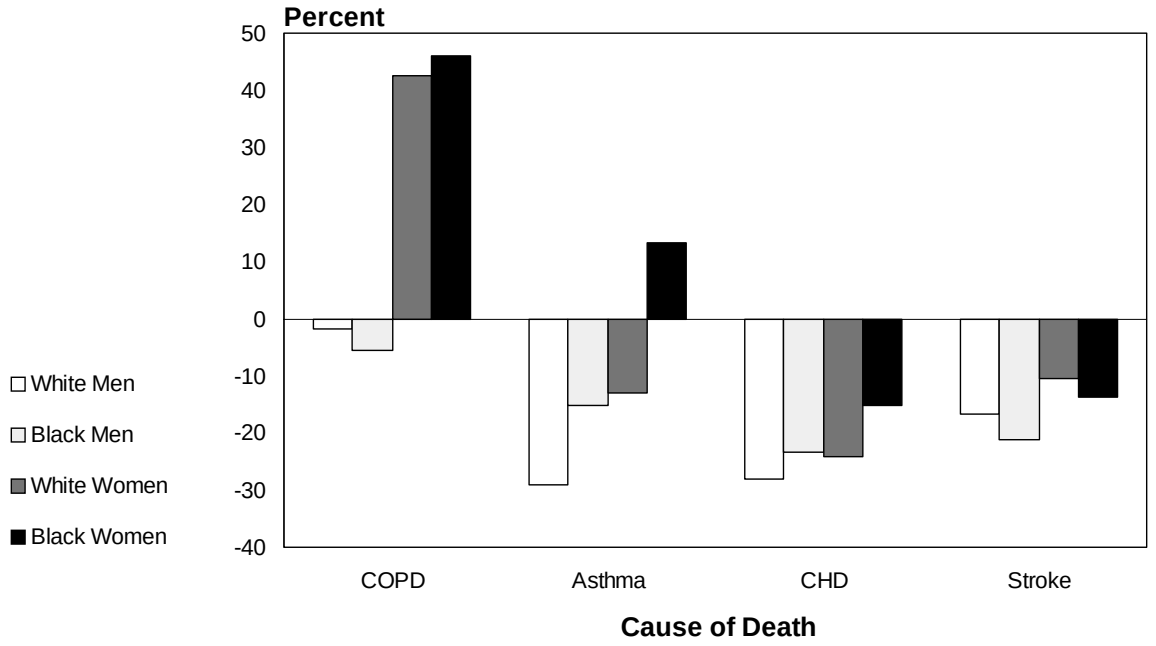
* Age-adjusted to the European Standard Population.
† The sudden decline is due to revision in the International Classification of Diseases in 1979.
Source: World Health Statistics Annual, World Health Organization (WHO).

Death Rates for Coronary Heart Disease in Women Ages 35-74 Years, Selected Countries, 1970-99



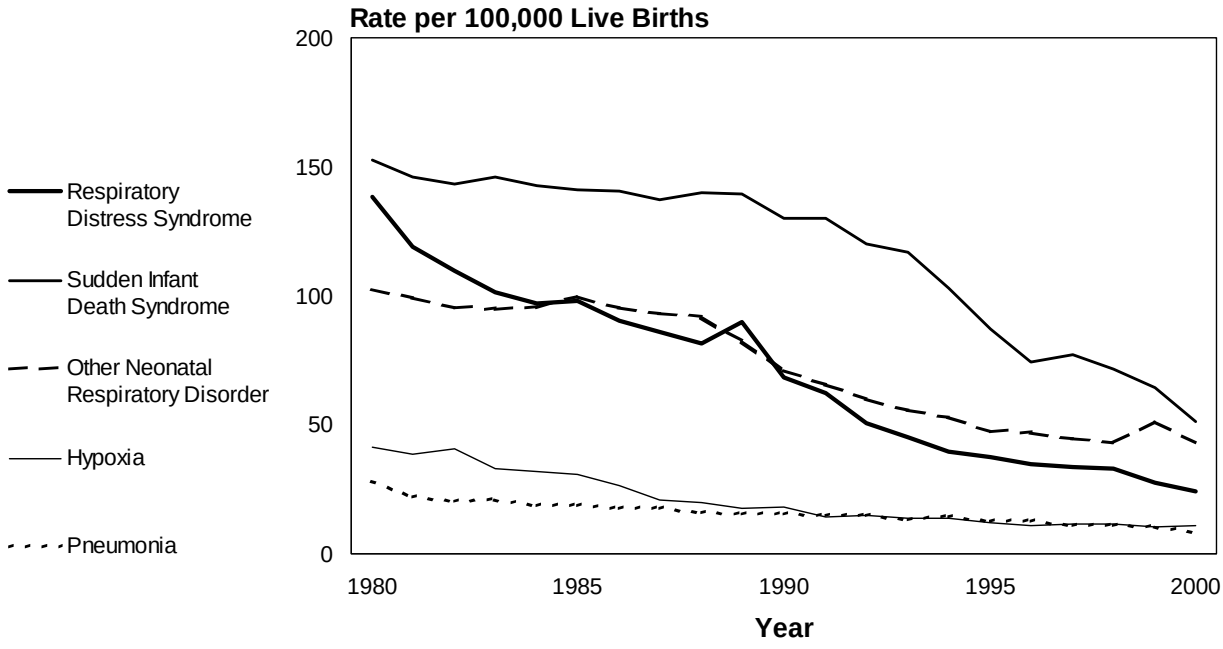
* Age-adjusted to the European Standard Population.
† The sudden decline is due to revision in the International Classification of Diseases in 1979.
Source: World Health Statistics Annual, WHO.

Change in Death Rates* for Selected Causes by Race and Gender, U.S., 1990-2000



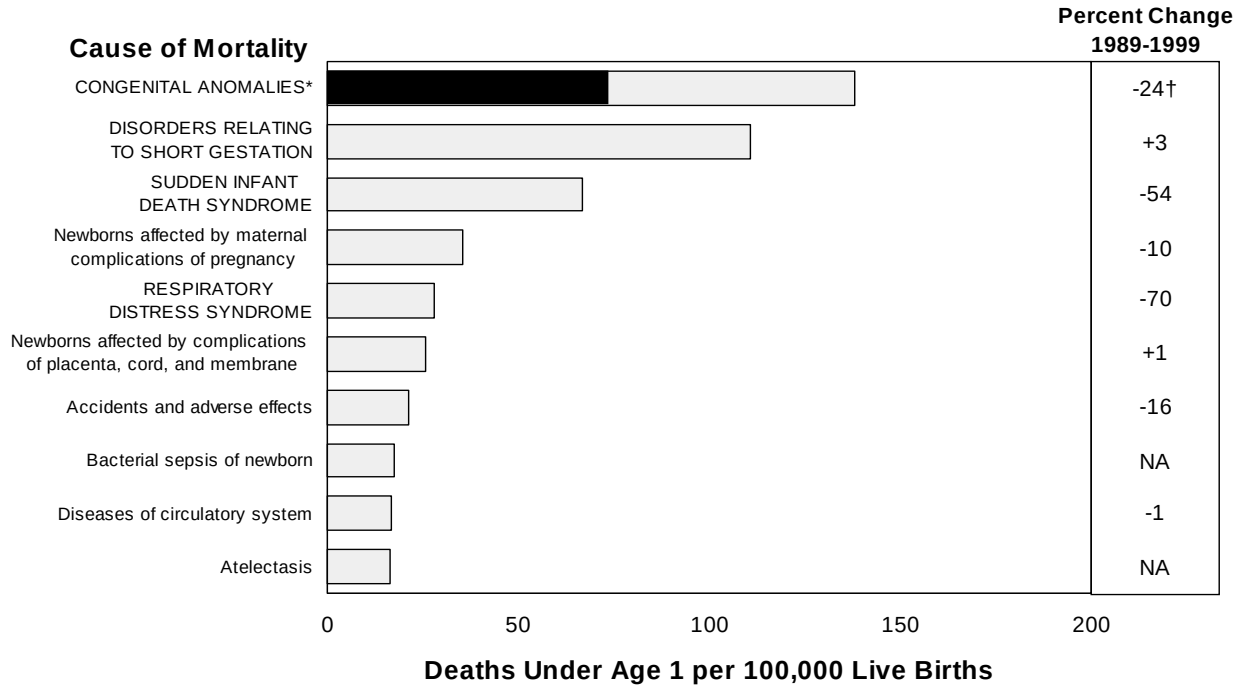
* Age-adjusted.
Source: Vital Statistics of the United States, NCHS.

Death Rates for Lung Diseases in Infants, U.S., 1980-2000



Source: Vital Statistics of the United States, NCHS.

Ten Leading Causes of Infant Mortality, U.S., 1999



* In 1999, congenital CVD and congenital anomalies of the respiratory system represented 43 percent of all infant deaths due to congenital anomalies.

† Between 1989 and 1999, congenital CVD declined 34 percent; congenital anomalies of the respiratory system declined 27 percent; other congenital anomalies declined 15 percent.

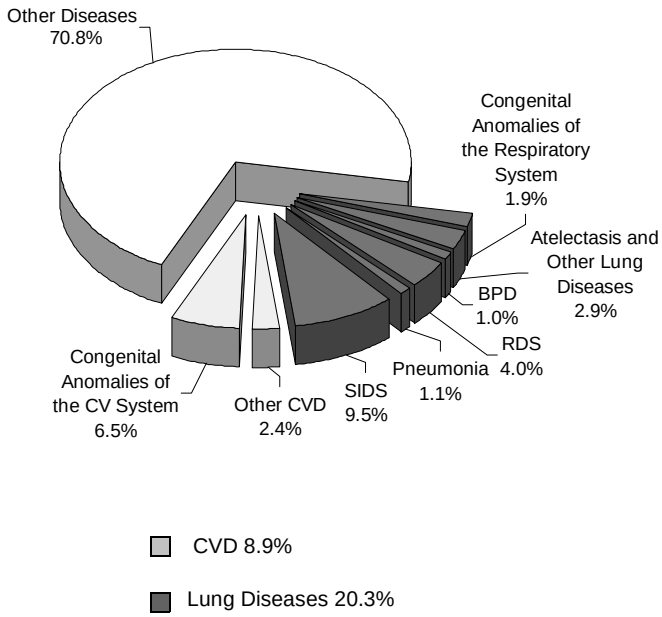
NA: Not available.

Note: Capitalization indicates diseases addressed in Institute programs.

Source: Vital Statistics of the United States, NCHS.

Deaths Under Age 1 Year Due to Cardiovascular and Lung Diseases, U.S., 1999

Cause of Death	Deaths Under Age 1
All Causes	27,937
Cardiovascular Diseases	2,480
Congenital Anomalies	1,818*
Other	667*
Lung Diseases	5,680
Sudden Infant Death Syndrome	2,648*
Respiratory Distress Syndrome	1,110*
Pneumonia	307
Bronchopulmonary Dysplasia (BPD)	294
Atelectasis of Newborn	647
Congenital Anomalies	521*
Other Lung Diseases	153
Other Diseases	19,777

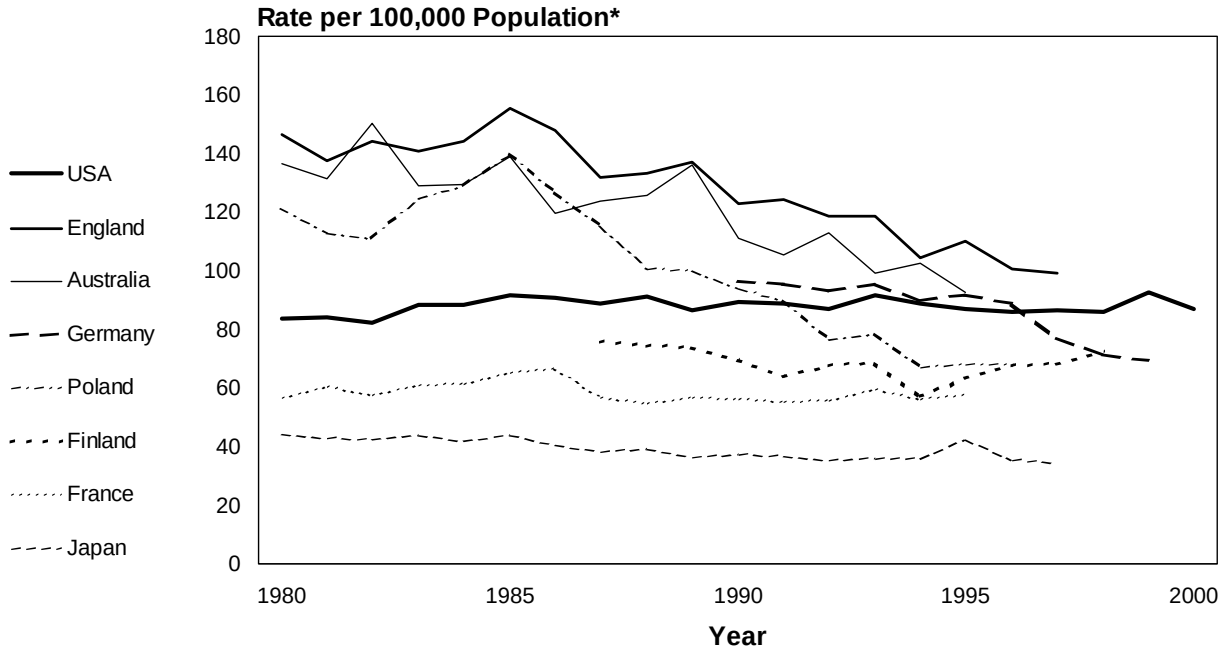


* NHLBI programs address these diseases.

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

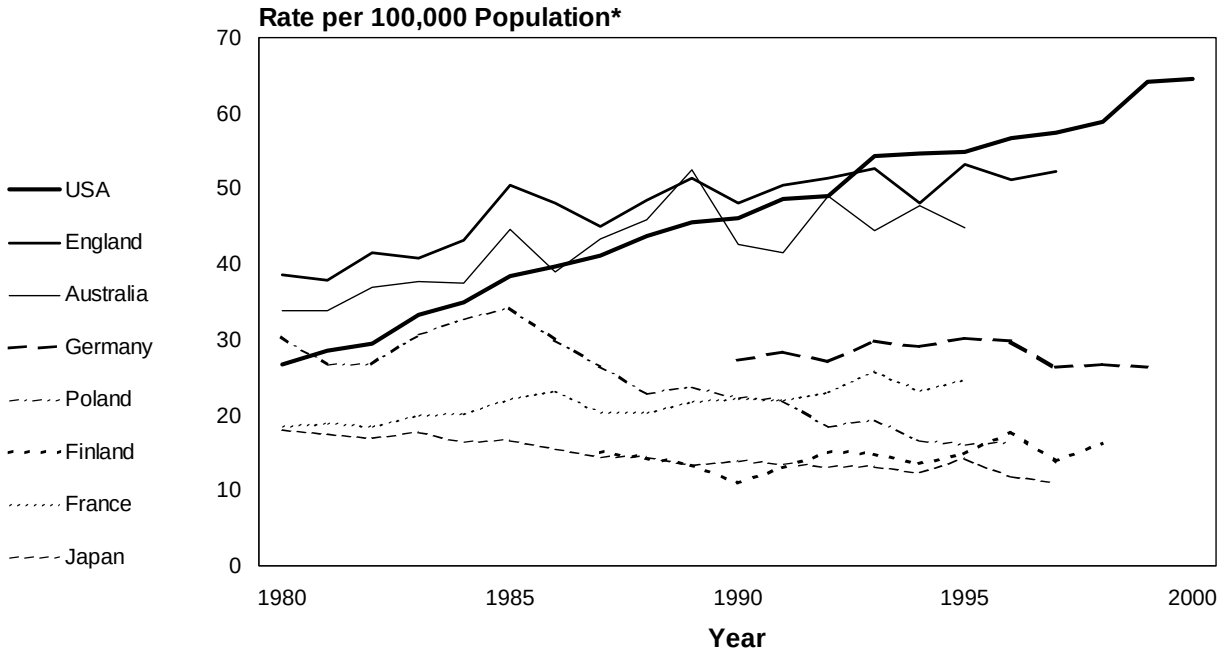
Source: Vital Statistics of the United States, NCHS.

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



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

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



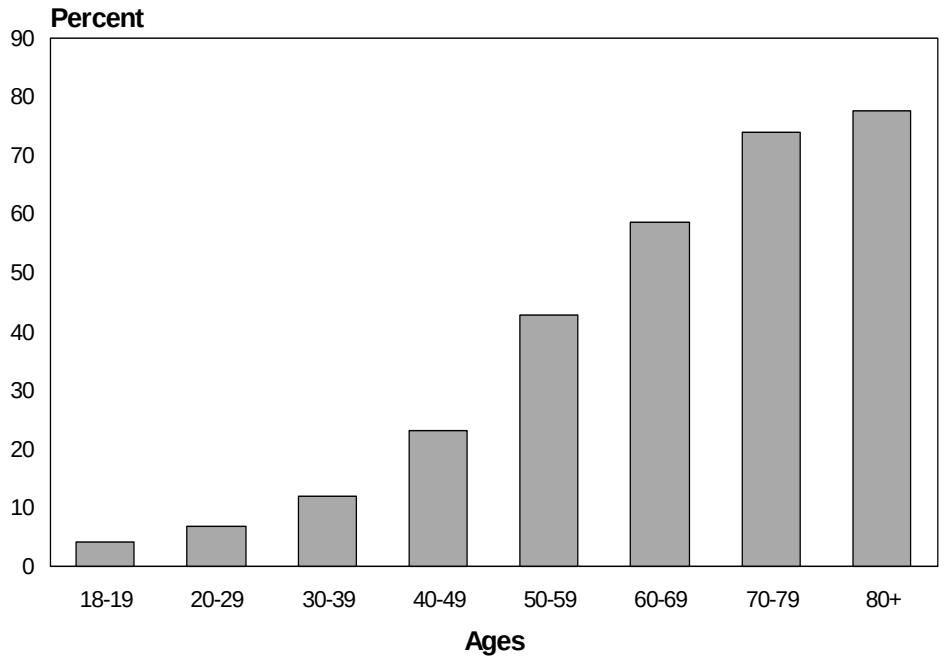
* Age-adjusted to the European Standard Population.
Source: World Health Statistics Annual, WHO.

Prevalence of Common Cardiovascular, Lung, and Blood Diseases, U.S., 1999

Disease	Number
Total Cardiovascular Diseases	61,800,000
Hypertension*	50,000,000
Coronary Heart Disease	12,600,000
Congestive Heart Failure	4,800,000
Cerebrovascular Diseases	4,600,000
Congenital Heart Disease	1,000,000
Asthma†	10,500,000
Chronic Bronchitis (age 18+)	8,800,000
Emphysema (age 18+)	2,800,000
Anemias (all forms)‡	3,500,000

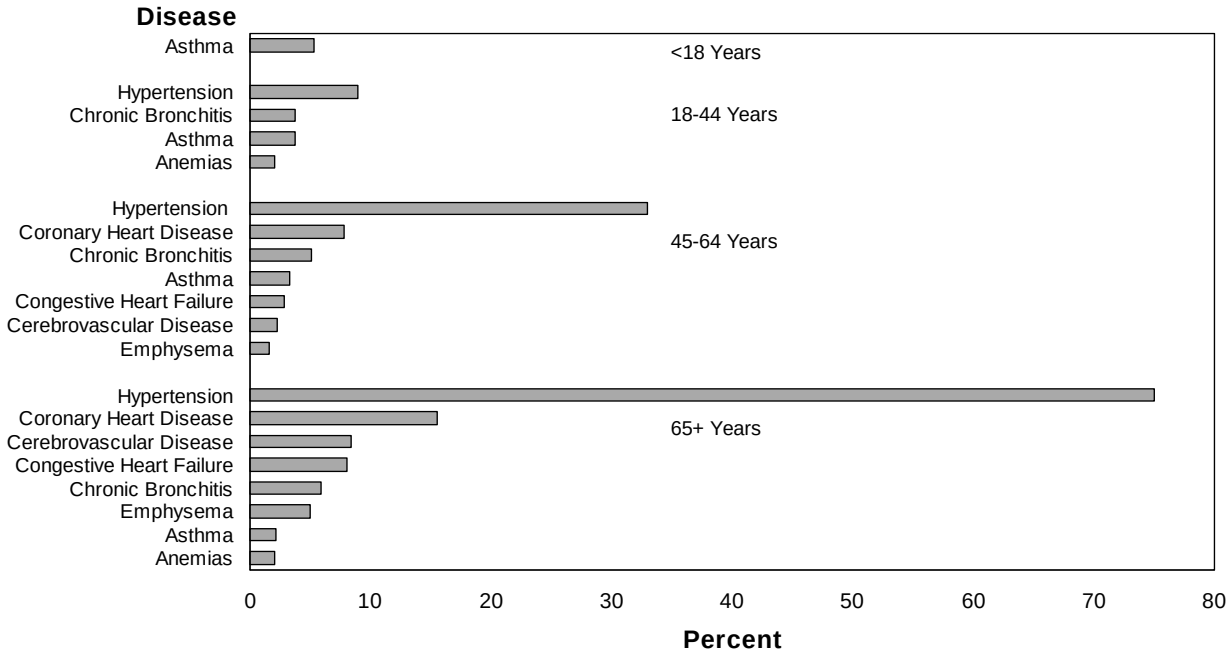
* Systolic blood pressure 140 mmHg or greater and/or diastolic 90 or greater or on antihypertensive medication.
† Positive response to question: During the past 12 months, have you had an episode of asthma or an asthma attack?
‡ For 1996.
Note: Some persons are included in more than one diagnostic group, and persons with more than one form of anemia are counted more than once.
Sources: Extrapolated to United States from National Health and Nutrition Examination Survey (NHANES), 1988-94, and National Health Interview Survey (NHIS), 1999.

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



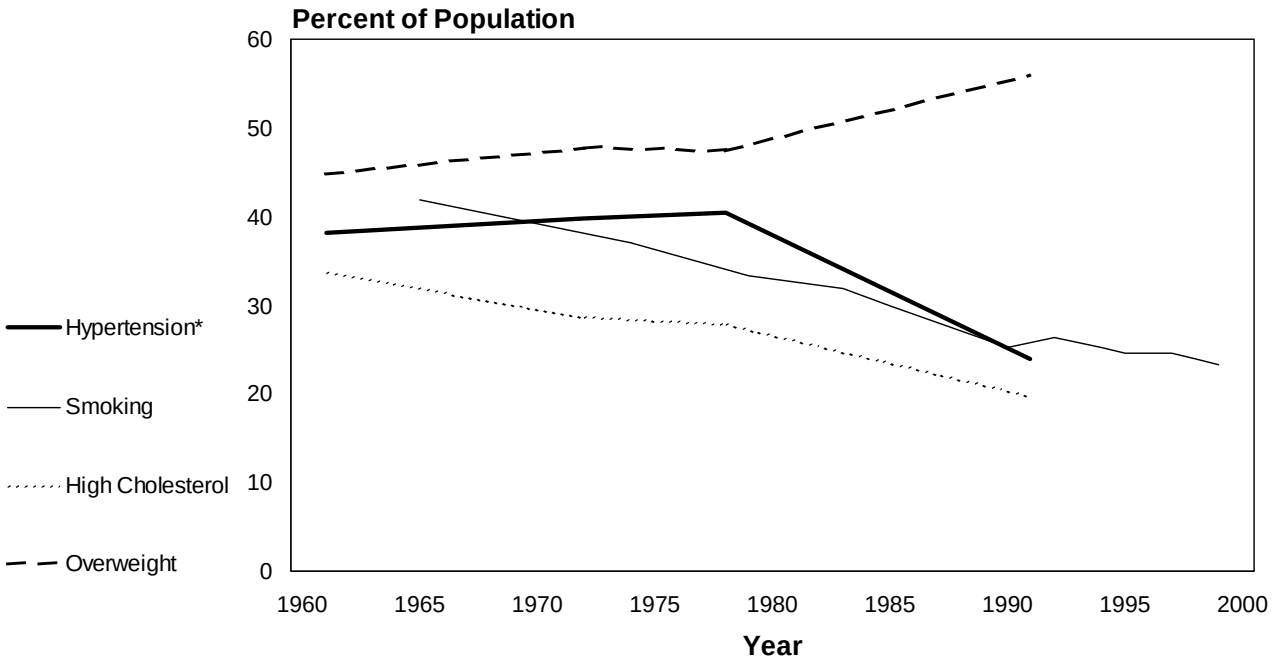
* Hypertension, coronary heart disease, cerebrovascular disease, congestive heart failure, rheumatic heart disease, or congenital cardiovascular disease. Hypertension = 140/90+ mmHg or on medication.
Source: NHANES, 1988-94.

Prevalence of Common Cardiovascular and Lung Diseases by Age, U.S., 1999



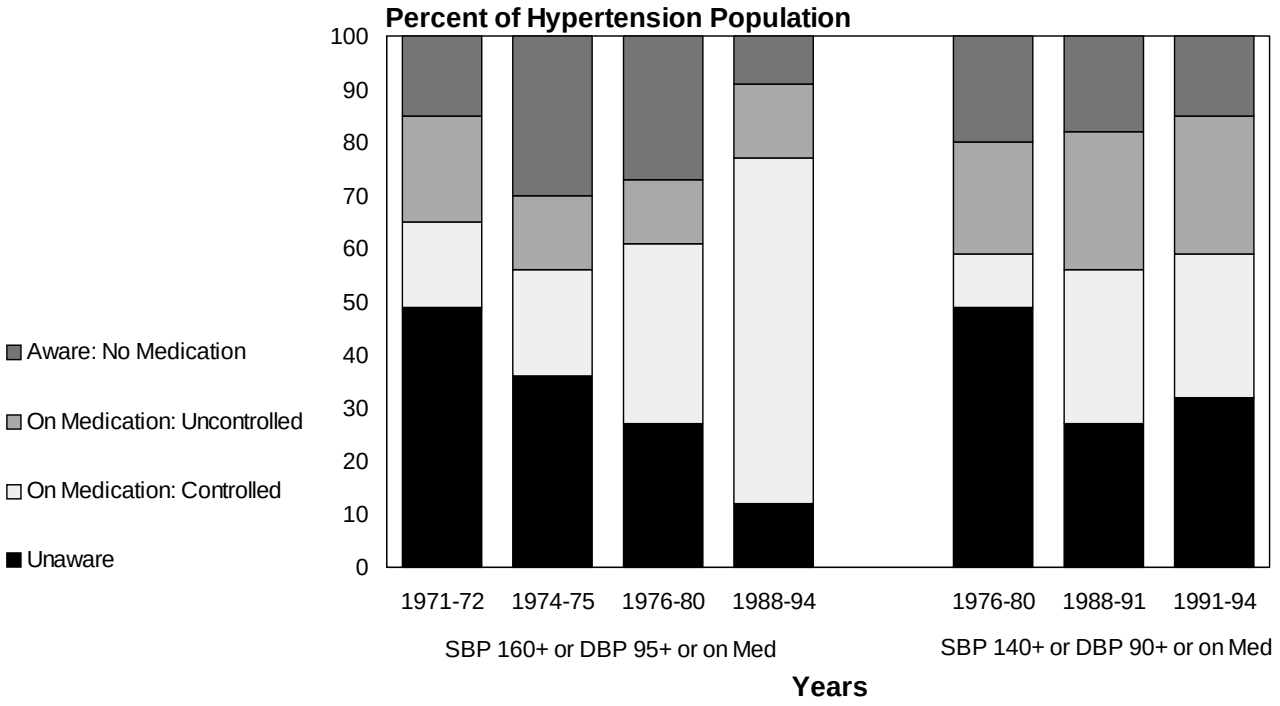
Note: Numbers depicted in bars are not additive by disease because some persons have more than one disease.
Source: NHIS and NHANES, NCHS.

Prevalence of Cardiovascular Disease Risk Factors in Adults, U.S., 1961-99

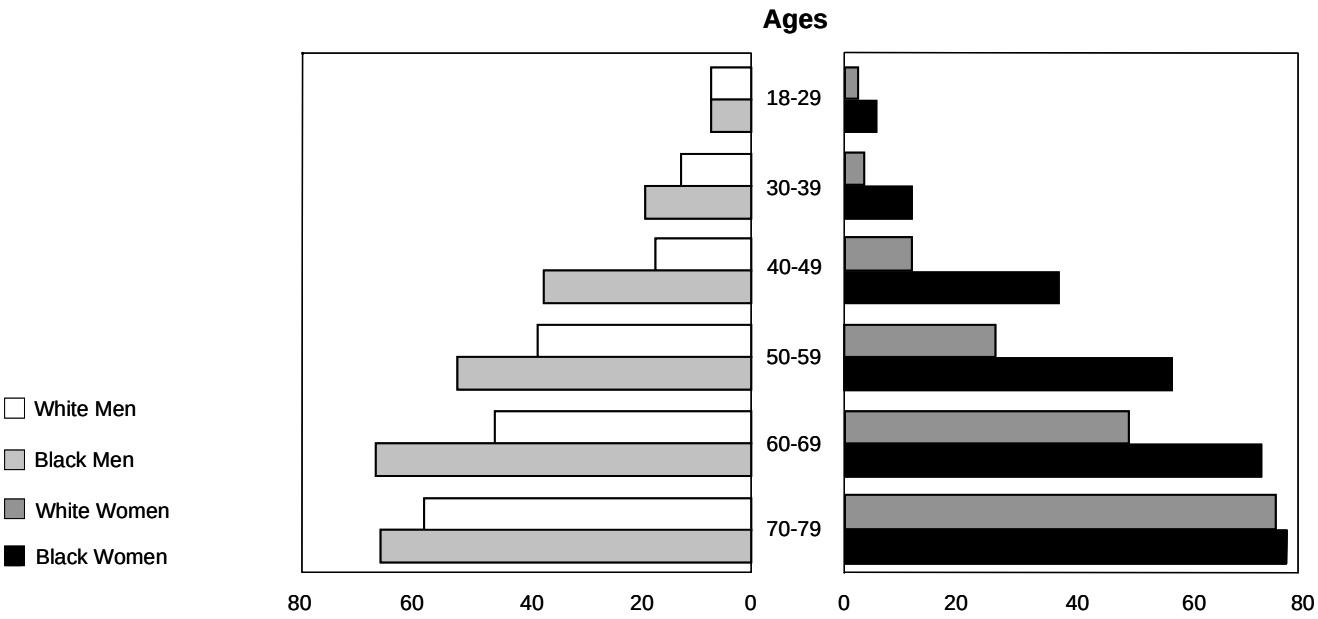


* Hypertension is blood pressure 140/90+ mmHg or on medication. Total serum cholesterol is 240+ mg/dl. Overweight is BMI 25 kg/m^2 or greater.
Source: NHIS for smoking and NHANES for the other risk factors (age 20+).

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

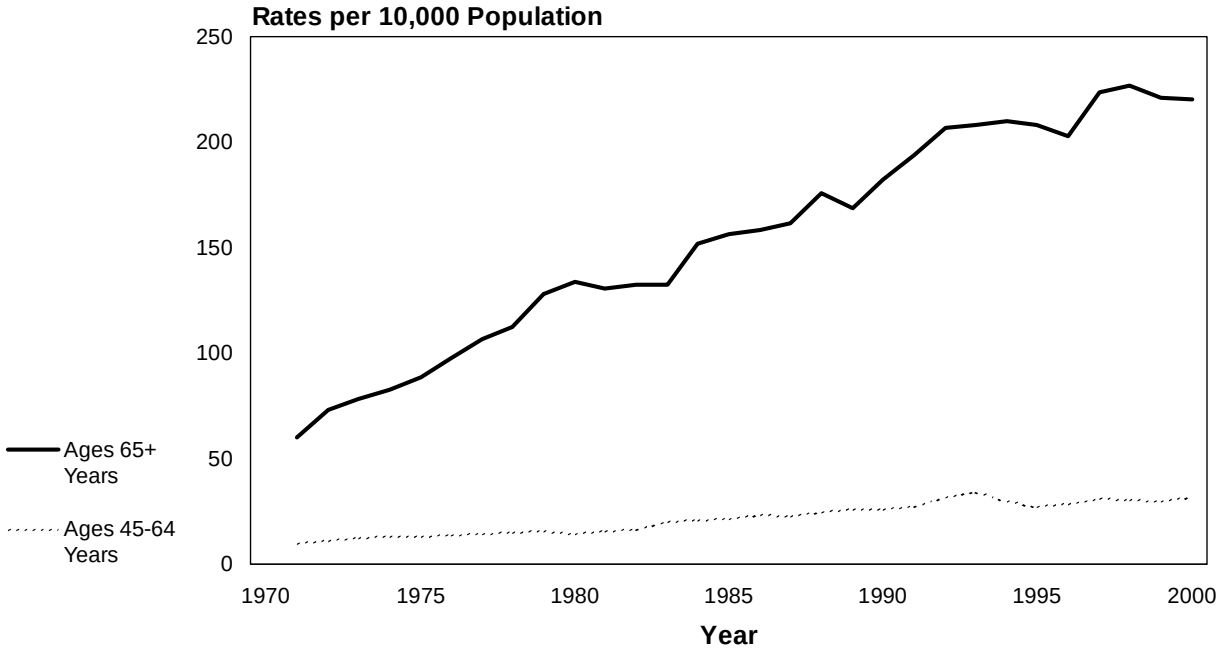


Adult Population With Hypertension* by Age, Gender, and Race, U.S., 1991-94



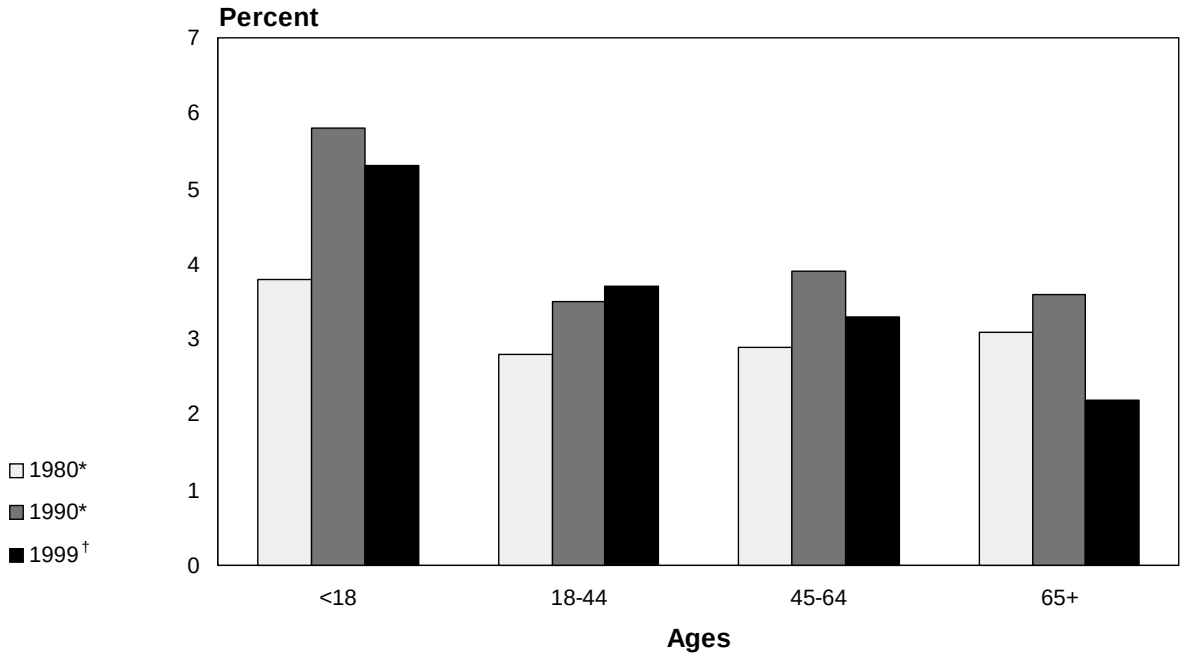
* Systolic blood pressure 140+ mmHg or diastolic blood pressure 90+ mmHg or taking antihypertensive medication.
Source: NHANES, NCHS, and personal communication.

Hospitalization Rates for Congestive Heart Failure, Ages 45-64 Years and 65+ Years, U.S., 1971-2000



Source: National Hospital Discharge Survey, NCHS.

Prevalence of Asthma by Age, U.S., 1980, 1990, and 1999



* Positive response to question: During the past 12 months, did anyone in your family have asthma?
† Positive response to question: During the past 12 months, have you had an episode of asthma or an asthma attack?
Note: NCHS changed interview questions, so estimates for 1999 are not comparable with earlier estimates.
Source: NHIS, NCHS.

Direct and Indirect Economic Costs of Illness by Major Diagnosis, U.S., 2002

	Amount (Dollars in Billions)				Percent Distribution			
		Indirect Costs				Indirect Costs		
	Direct Costs*	Morbidity†	Mortality‡	Total	Direct Costs	Morbidity	Mortality	Total
Cardiovascular Disease	199.5	30.9	98.8	329.2	14.8	17.0	22.8	16.8
(including Blood Clotting)§	(47.0)	(6.8)	(23.6)	(77.4)	(3.5)	(3.7)	(5.4)	(3.9)
Lung Diseases**	65.4	23.8	26.7	115.9	4.9	13.1	6.2	5.9
Blood Diseases	7.1	0.7	1.9	9.7	0.5	0.4	0.4	0.5
Subtotal	272.0	55.4	127.4	454.8	20.2	30.5	29.4	23.2
Diseases of the Digestive System	137.0	9.3	18.7	165.0	10.2	5.1	4.3	8.4
Neoplasms	60.9	15.5	95.2	171.6	4.5	8.5	21.9	8.7
Mental Disorders	109.1	23.9	6.7	139.7	8.1	13.2	1.5	7.1
Diseases of the Nervous System	109.7	7.1	8.3	125.1	8.2	3.9	1.9	6.4
Diseases of the Musculoskeletal System	77.2	18.6	1.8	97.6	5.7	10.2	0.4	5.0
Diseases of the Genitourinary System	56.6	4.8	4.2	65.6	4.2	2.6	1.0	3.3
Endocrine, Nutritional, and Metabolic Diseases	53.6	6.0	14.4	74.0	4.0	3.3	3.3	3.8
Infectious and Parasitic Diseases	27.1	11.1	22.3	60.5	2.0	6.1	5.1	3.1
Diseases of the Skin	30.2	1.5	0.4	32.1	2.2	0.8	0.1	1.6
Other Respiratory Diseases	36.8	7.3	1.8	45.9	2.7	4.0	0.4	2.3
Other and Unallocated to Diseases	375.1	21.2	132.6	528.9	27.9	11.7	30.6	27.0
Total	**$1,345.3**	**$181.7**	**$433.8**	**$1,960.8**	**100%**	**100%**	**100%**	**100%**

* Direct costs are personal health care expenditures for hospital and nursing home care, drugs, home care, and physician and other professional services. The estimation method is based on HCFA projections for total 2002 health expenditures by type of direct costs and NCHS estimates of direct costs in 1995 for each of the major diagnostic groups. The proportion of costs for 1995 for each diagnostic group is applied to the equivalent 2002 total by type of direct cost.

† Morbidity costs were estimated for 2002 by multiplying NCHS estimates for 1980 by a 2.79 percent inflation factor derived from the increase in mean earnings estimated by the Bureau of the Census.

‡ The mortality cost for each disease group was estimated for 2002 by first multiplying the number of deaths in 1998 in each age- and sex-specific group by the 1998 present value of lifetime earnings (latest available); second, summing these estimates for each diagnostic group; and third, multiplying the estimates by a 1998-2002 inflation factor (1.25) based on change in mean earnings.

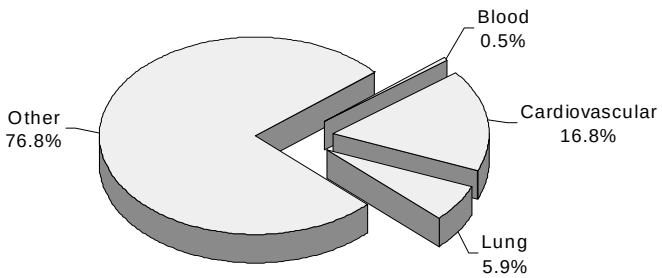
§ Costs of blood-clotting disease are estimated from predetermined proportions of CVD morbidity and mortality statistics for MI, cerebrovascular diseases, and diseases of arteries.

** Does not include lung cancer or leukemia.

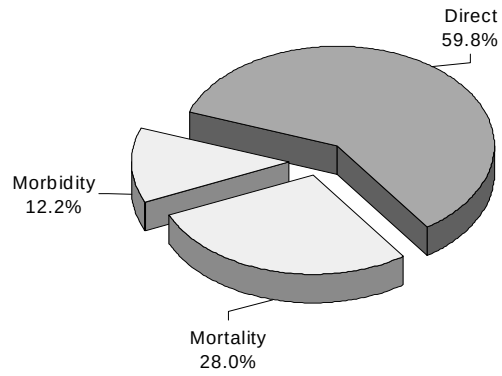
Note: Numbers may not add to totals due to rounding.

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

Total Economic Costs, U.S., 2002



Economic Costs: Cardiovascular, Lung, and Blood Diseases, U.S., 2002



5. Institute-Initiated Programs Starting in FY 2001

More than two-thirds of the research supported by the NHLBI is initiated by individual investigators; the remainder is initiated by the Institute. This chapter describes the rationale for Institute-initiated programs and the objectives of the Institute-initiated programs that began in FY 2001.

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, by Institute advisory committees and special emphasis panels, and by the National Heart, Lung, and Blood Advisory Council (NHLBAC). 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 offer the best opportunities or have the greatest needs. This process contributes to policy development at the national level by setting priorities among competing programs and establishing budgets for individual programs and projects.

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

RFA, RFP, and PA concepts prepared by the Institute are presented to the NHLBAC for review, comments, and concurrence.

Initiatives that receive the approval of the NHBLAC 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 decisions to approve initiatives for release. Released initiatives are announced in the weekly *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).

The following are the FY 2001 Institute-initiated programs and the trans-NIH initiatives that included NHLBI participation.

Heart and Vascular Diseases Program

Initiatives Being Renewed

Framingham Study

The purpose of this renewal is to continue and extend research to identify genetic and environmental factors related to development of cardiovascular, lung, and blood diseases. This research focuses on complex pedigrees involving individuals within three generations. Scientists are seeking to identify determinants of the evolution of risk factors, and subclinical and clinical manifestations of cardiovascular, lung, and blood diseases. A resource for genetic and nongenetic studies of disease risk will be established using personal data, DNA, and transformed cells from Framingham Study participants.

Specialized Centers of Research (SCORs) in Molecular Genetics of Hypertension

The purpose of this renewal is to continue to support a collaborative network of closely interacting, multiproject SCORs that are seeking to identify and map genes associated with high blood pressure, studying the biological consequences of variations in genes linked to hypertension or its complications, and elucidating basic mechanisms of normal and altered regulation of blood pressure.

New Initiatives

Pediatric Heart Disease Clinical Research Network

The purpose of this RFA is to establish a pediatric clinical research network to evaluate new treatment and management strategies for children with structural congenital heart disease, inflammatory heart disease, heart muscle disease, and arrhythmias. The network consists of seven clinical centers and a data coordinating center, and will provide an infrastructure for conducting multiple, multicenter trials and studies in pediatric CVD.

Susceptibility to Target Organ Damage in High Blood Pressure

The purpose of this RFA is to identify genetic and biological factors that increase an individual's susceptibility to hypertension-related organ damage. Organs at risk include kidneys, heart, brain, and eyes. Research is directed toward understanding racial and ethnic differences in vulnerability to, and intensity of, organ injury in individuals, even those with comparable levels and duration of high blood pressure.

Lung Diseases Program

Initiatives Being Renewed

Cellular and Molecular Mechanisms of Primary Pulmonary Hypertension

The purpose of this PA renewal is to determine the genetic basis of primary pulmonary hypertension and to elucidate cellular and molecular mechanisms associated with pulmonary vascular remodeling and pulmonary vascular tone. The ultimate goal is to develop new and effective therapies.

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

The purpose of these programs is to foster multidisciplinary basic and clinical research in the above areas so that basic scientific findings can be rapidly applied to clinical problems. Results from these SCOR grants are expected to have an impact on prevention, diagnosis, and treatment of asthma, fibrotic lung disease, and pulmonary diseases.

New Initiatives

Genetic Aspects of Tuberculosis in the Lung

The purpose of this RFA is to stimulate research on the genetic aspects of TB, using advances in molecular biology and genomics research. Topics of interest include interaction between host and microbial genes, and identification of genes that determine virulence, latency, or reactivation of disease or resistance to pharmacologic therapy.

Novel Biomarkers of Chronic Obstructive Pulmonary Disease

The purpose of this RFA is to identify and characterize new biomarkers of COPD presence, severity, and exacerbation. The biomarkers may facilitate investigations of the natural history and epidemiology of COPD, aid phenotyping in studies of associated genetic factors, and clarify the relationships of existing animal models to the human disease.

Sleep and Sleep Disorders in Children

The purpose of this RFA is to determine how sleep deprivation and sleep disorders affect the cardiopulmonary, hematologic, and behavioral health of children. Objectives are to advance understanding of age-specific and individual requirements for sleep in children, to define pathophysiologic mechanisms underlying emergence and progression of childhood sleep disorders, and to identify genetic factors and phenotypic variations in sleep characteristics that determine childhood patterns of sleep and circadian rhythmicity.

Severe Asthma Research Program

The purpose of this RFA is to investigate the pathophysiologic mechanism for severe asthma, determine the difference between severe and mild-to-moderate asthma, and identify new targets for potential therapeutic intervention.

Blood Diseases and Resources Program

Initiatives Being Renewed

Specialized Centers of Research (SCORs) in Hemostatic and Thrombotic Diseases

The purpose of this program is to bring together basic, applied, and clinical scientists to interact and address rel-

evant clinical issues in hemostatic and thrombotic diseases. Research findings will be used to improve diagnosis, treatment, and prevention of these diseases.

Specialized Centers of Research (SCORs) in Transfusion Biology and Medicine

This purpose of this program is to improve the safety and efficacy of blood and blood components, determine indications for their use, evaluate and potentially modify immunologic responsiveness following their administration, and develop and evaluate alternative treatment strategies that substitute for certain of their functions or stimulate their endogenous production.

Trans-NHLBI

Initiatives Being Renewed

Mentored Minority Faculty Development Award (K01)

The purpose of this RFA is to enhance the research skills of underrepresented minority faculty members in cardiovascular, pulmonary, and hematologic diseases; sleep disorders; and transfusion medicine; and to increase the number of underrepresented minority researchers. An investigator accomplished in the proposed area of research, who has experience in developing independent investigators, will mentor the applicant.

Minority Institution Research Scientist Development Award (K01)

The purpose of this RFA is to enhance research skills among faculty at minority institutions. Applicants for this award should have doctoral degrees in biomedical or behavioral science in areas relevant to the NHLBI. These applicants will establish a mentoring relationship with an accomplished investigator at a nearby institution. Important program goals are to enhance the minority institutions' science infrastructure and to provide research opportunities for underrepresented minorities at the applicant institutions.

Minority Institutional Research Training Program (T32M)

The purpose of this RFA is to provide full-time research training for investigative careers at minority schools in areas of cardiovascular, pulmonary, and hematologic diseases, and sleep disorders. The minority institution must identify and collaborate with a research center (medical school or comparable institution) that has strong, well-established, and relevant research and research training programs. A mentor from the research center will assist the adviser at the minority institution in the trainee's development and research plan.

Short-Term Training for Minority Students (T35M)

The purpose of this RFA is to encourage institutions to provide opportunities for underrepresented minority undergraduate and graduate students to become exposed to biomedical or behavioral research in areas relevant to cardiovascular, pulmonary, and hematologic diseases, and sleep disorders, through a short-term, full-time research experience of 2 to 3 consecutive months.

New Initiatives

Ancillary Studies in Heart, Lung, and Blood Disease Trials

The objective of this RFA is to conduct ancillary mechanistic studies, using patients and patient materials from clinical trials related to heart, lung, and blood diseases. Studies include mechanisms underlying interventions, surrogate markers or biomarkers of disease activity and therapeutic effect, and mechanisms underlying cardiopulmonary and hematologic function.

Cardiovascular, Lung, and Blood Immunobiology in Health and Disease

The purpose of this RFA is to increase fundamental knowledge of cellular and molecular mechanisms and signaling processes regulating the immune system as it relates to the healthy heart, vasculature, lung, and blood.

Functional Tissue Engineering for Heart, Vascular, Lung, Blood, and Sleep Disorders and Diseases: SBIR/STTR Initiative

The purpose of this PA is to encourage small businesses to participate in research and development of new approaches, technologies, tools, devices, cells, biomolecules, and biomaterials to use in engineering functional tissues in vitro for implantation in vivo as a biological substitute for damaged or diseased tissues and organs. In addition, the PA wishes to encourage research fostering tissue regeneration and remodeling in vivo for the purpose of repairing, replacing, maintaining, or enhancing organ function. Scientists will direct their efforts toward improving clinical therapies for cardiovascular, lung, and blood diseases, and sleep disorders.

Overcoming Barriers to Treatment Adherence in Minorities and Persons Living in Poverty

The purpose of this RFA is to evaluate interventions designed to improve adherence to medically prescribed

lifestyles and medical regimens for treating heart, lung, and blood diseases, and sleep disorders. Emphasis is upon innovative approaches to overcoming patient, provider, and medical systems barriers that interfere with treatment adherence among racial and ethnic minorities and persons living in poverty.

Technologies for Monitoring and Performing Resuscitation: SBIR/STTR Initiative

The purpose of this PA is to encourage use of SBIR and STTR programs to stimulate biomedical engineering research related to technologies associated with cardiopulmonary resuscitation.

Trans-NIH

Initiative Being Renewed

Immunopathogenesis of Chronic Graft Rejection

The purpose of this renewal is to investigate the cellular and molecular events involved in chronic organ graft rejection, to improve therapeutic approaches to enhance long-term graft survival, and to develop new tools for diagnosing the outcome of allograft (as opposed to genetic) transplantation.

New Initiatives

Blood and Marrow Transplant Clinical Research Network

The purpose of this RFA is to establish a clinical network to accelerate research in hematopoietic stem cell transplantation. The network will compare new therapies to existing ones and ensure rapid dissemination of research findings to practitioners and health care professionals.

Genetic Modifiers of Single Gene Defect Diseases

The purpose of this RFA is to identify and characterize modifier genes responsible for variation in clinical progression and outcome of SCD and other heart, lung, and blood diseases due to single-gene defects.

Innovative Grants on Immune Tolerance

The purpose of this RFA is to encourage high-risk, novel research on molecular mechanisms and the application of antigen-specific immune tolerance for treatment of allergies, asthma, autoimmune diseases, and transplant rejection.

Network for Large-Scale Sequencing of the Rat Genome

The purpose of this RFA is to set up a Rat Genome Sequencing Network to generate a working draft of the rat genome within 2 years. As the rat sequence data become available, they will be released to GenBank for use by the international research community.

Pathogenesis and Treatment of Lymphedema

The purpose of this PA is to investigate the pathogenesis of, and treatment for, primary and secondary lymphedema (swelling of subcutaneous tissues caused by a breakdown in regulation of lymphatic drainage).

Pharmacogenetics Research Network

The purpose of this network is to establish multidisciplinary collaborative research groups to study how genetic variation contributes to interindividual differences in drug responses. Scientists will develop a comprehensive pharmacogenetic database of integrative information about specific response-related proteins and genes.

Self-Management Strategies Across Chronic Diseases

The purpose of this PA is to increase the generalizability of established research on self-management interventions for particular chronic diseases to a broad spectrum of multiple chronic diseases. The two programs supported by the NHLBI focus on self-management of CVD and asthma.

Stem Cell Plasticity in Hematopoietic and Non-Hematopoietic Tissue

The purpose of this RFA is to promote exploration and characterization of stem cell plasticity in hematopoietic and nonhematopoietic tissues. Of particular importance is to study cellular and molecular mechanisms that enable adult stem cells with hematopoietic potential to express other potentials and to determine if precursor cells of adult nonhematopoietic tissues can express hematopoietic potential.

Transactivation of Fetal Hemoglobin Genes for Treatment of Sickle Cell Disease and Cooley's Anemia

The purpose of this RFA is to elucidate the molecular pathways that activate fetal hemoglobin expression. Research focuses upon transactivator proteins and their ability to stimulate fetal hemoglobin expression as a novel treatment of SCD and Cooley's anemia.

Treatment of HIV and Associated Complications in Hemophiliacs

The purpose of this RFA is to encourage understanding of the pathogenesis of HIV in the hemophilic population, as well as of clinical issues unique to the HIV-infected hemophilic population (e.g., short-term and long-term outcomes of antiretroviral therapy, protective resistance to HIV-infection, nonprogression to AIDS, and coinfection with Hepatitis C).

6. Institute Public Advisory Committees

National Heart, Lung, and Blood Advisory Council

Structure

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

Executive Secretary: Edward M. Donohue, Acting Director, Division of Extramural Affairs, NHLBI, National Institutes of Health, Bethesda, MD 20892; (301) 435-0260.

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

Members are appointed for overlapping terms of 4 years.

The Council includes the following ex officio members:

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

Functions

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

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

The Council may also make recommendations to the Director of the 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

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

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

Carolyne Sue Byrnes (2004)
LAM Foundation

Allen W. Cowley, Jr., Ph.D. (2002)
Medical College of Wisconsin

Paul L. Douglass, M.D., F.A.C.C. (2002)
Metropolitan Atlanta Cardiology Consultants, P.C.

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

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

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

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

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

Paula Y. Polite (2001)
Sarcoidosis Research Institute

Amelie G. Ramirez, Dr.P.H. (2002)
Baylor College of Medicine

Robert Roberts, M.D. (2004)
Baylor College of Medicine

Robert D. Rosenberg, M.D., Ph.D. (2002)
Massachusetts Institute of Technology

Roger G. Spragg, M.D. (2002)
University of California, San Diego

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

Paul K. Whelton, M.D. (2001)
Tulane University Health Sciences Center

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

Ex Officio Members

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Walter Reed Army Medical Center

Ruth L. Kirschstein, M.D.
National Institutes of Health

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

Tommy G. Thompson
Department of Health and Human Services

* Current as of October 2001. The current roster, containing full addresses for the NHLBI Advisory Council and Committees, can be obtained from the NHLBI's home page on the Internet at http:/ /www.nhlbi.nih.gov/nhlbi/meetings/index.htm.

Public Advisory and Review Committees

Sickle Cell Disease Advisory Committee

Chair: Paul S. Swerdlow, M.D., Wayne State University School of Medicine

Executive Secretary: Charles M. Peterson, M.D., Director, Blood Diseases Program, DBDR, NHLBI, National Institutes of Health, Bethesda, MD 20892; (301) 435-0050.

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

Membership*

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

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

Peter A. Lane, Jr., M.D. (2003)
University of Colorado Health Sciences Center

Herbert J. Meiselman, Sc.D. (2003)
University of Southern California

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

Marie J. Stuart, M.D. (2003)
Thomas Jefferson University

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

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

Ex Officio Members

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

Ruth Kirschstein, M.D.
National Institutes of Health

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

Sleep Disorders Research Advisory Board

Chair: Emmanuel Mignot, M.D., Ph.D., Stanford University School of Medicine

Executive Secretary: Carl E. Hunt, M.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 on 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 the Center's targeted programs should address, including the identification of basic, clinical, and health education topics of importance to national health fields.

Membership*

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

Mary A. Carskadon, Ph.D. (2003)
Brown University School of Medicine

James Everett, M.D. (2002)
Morehouse School of Medicine

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

Sandra B. McGinnis (2003)
Patient Advocate-Sleep

Dara D. Spearman (2003)
University of Michigan

* Current as of October 2001.

Phillip L. Williams (2004)
Bethlehem Steel

Ex Officio Members

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

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

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

Ruth Kirschstein, M.D.
National Institutes of Health

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

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

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

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

Clinical Trials Review Committee

Chair: Carl J. Pepine, M.D., University of Florida

Scientific Review Administrator: Joyce A. Hunter, Ph.D., Health Science Administrator, Division of Extramural Affairs, NHLBI, National Institutes of Health, Bethesda, MD 20892; (301) 435-0287

The Clinical Trials Review Committee provides initial technical merit review for the NHLBAC and the Director of the NHLBI on clinical trial applications for the support of studies to evaluate preventive or therapeutic measures of cardiovascular, lung, or blood diseases.

Membership*

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

Vernon M. Chinchilli, Ph.D. (2003)
Pennsylvania State University College of Medicine

James E. Fish, M.D. (2005)
Thomas Jefferson Medical College

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

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

James D. Hosking, Ph.D. (2003)
University of North Carolina

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

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

Edward L. Peterson, Ph.D. (2002)
Henry Ford Hospital

Cynthia S. Rand, Ph.D. (2003)
The Johns Hopkins Asthma and Allergy Center

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

Charles M. Stein, Ph.D. (2004)
Vanderbilt University School of Medicine

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

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

Heart, Lung, and Blood Program Project Review Committee

Chair: Dean Sheppard, M.D., University of California, San Francisco

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

The Heart, Lung, and Blood Program Project Review Committee provides initial technical merit review for the NHLBAC and the Director of the NHLBI regarding

* Current as of October 2001.

program project applications proposing research in the areas of heart, lung, and blood diseases and resources.

Membership*

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

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

Debra I. Diz, Ph.D. (2003)
Wake Forest University

Claire M. Doerschuk, M.D. (2002)
Case Western Reserve University

Joe G. N. Garcia, M.D. (2005)
The Johns Hopkins University

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

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

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

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

K. J. Koa, M.D., Ph.D. (2005)
University of Florida

Aldons J. Lusis, Ph.D. (2003)
University of California, Los Angeles

Thomas R. Martin, M.D. (2003)
University of Washington

Gary K. Owens, Ph.D. (2003)
University of Virginia School of Medicine

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

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

Gilbert C. White II, M.D. (2003)
University of North Carolina

National Heart, Lung, and Blood Institute Special Emphasis Panel

The Institute has established the NHLBI Special Emphasis Panel (SEP) to perform initial peer review of applications and proposals, which 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, provides required peer review expertise at precisely the time when it is needed.

Board of Scientific Counselors

Chair: Lorraine J. Gudas, Ph.D., Cornell University Medical College

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

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

Membership*

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

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

Joseph Loscalzo, M.D., Ph.D. (2004)
Boston University School of Medicine

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

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

* Current as of October 2001.

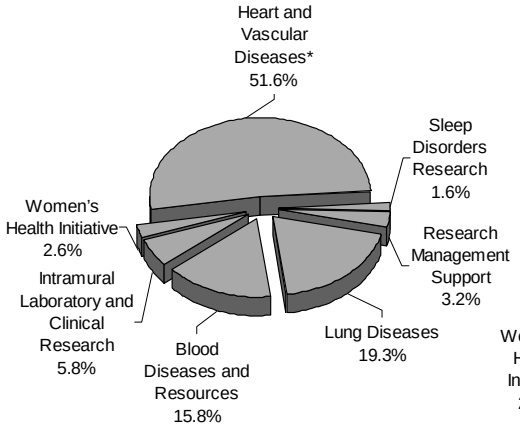
7. Fiscal Year 2001 Budget Overview

NHLBI Obligations by Funding Mechanism: Fiscal Year 2001

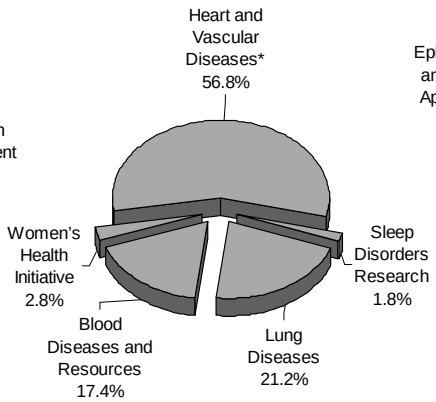
Funding Mechanism	Obligated Dollars* (Thousands)	Percent of Total NHLBI Budget
Research Project Grants†	$1,580,751	68.8%
Specialized Centers of Research (SCORs)	106,661	4.6
Sickle Cell Centers	18,144	0.8
Center for AIDS Research	2,427	0.1
Other Research Grants	88,958	3.9
Research Careers Programs‡	*57,470*	*2.5*
Training Programs	73,719	3.2
Research and Development Contracts	220,056	9.6
Intramural Laboratory and Clinical Research	133,765	5.8
Research Management and Support§	73,554	3.2
Research Facilities Construction Grants	—	—
Total Obligations	**$2,298,035**	**100%**

* Excludes funds provided by other agencies by means of a reimbursable agreement.
† Includes $54,934 for Small Business Innovation Research (SBIR) Grants.
‡ Research Career Programs are a subset of Other Research Grants and are not added as a distinct funding mechanism.
§ Excludes OD and DIR research contracts, which are included in R&D contracts.

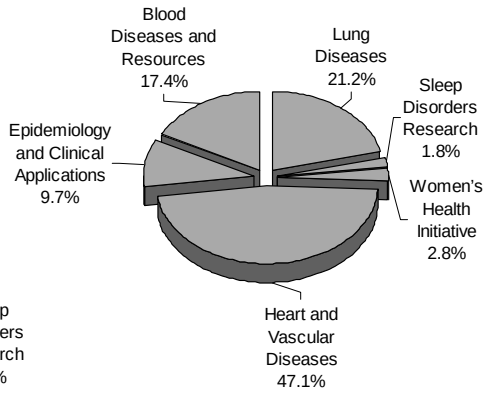
NHLBI Total Obligations by Budget Category



NHLBI Extramural Obligations by Program



NHLBI Etramural Obligations by Division



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

For detailed data on FY 2001:

- Research grants, see Chapters 9 and 11
- Research and development contracts, see Chapters 10 and 11
- Research training and career development, see Chapter 13
- Geographic distribution of awards, see Chapter 14.

NHLBI Extramural Obligations by Program: Fiscal Year 2001

Program	Obligated Dollars (Thousands)	Percent of NHLBI Extramural Budget
Heart and Vascular Diseases*	$1,186,639	56.8%
Lung Diseases	443,910	21.2
Blood Diseases and Resources	363,973	17.4
Sleep Disorders Research	36,994	1.8
Women's Health Initiative	59,200	2.8
Total, Extramural Obligations	**$2,090,716**	**100%**

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

NHLBI Heart and Vascular Diseases Program* Obligations by Funding Mechanism: Fiscal Year 2001

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	$795,384	80.8%
Specialized Centers of Research (SCORs)	47,489	4.8
Other Research Grants	29,708	3.0
Research Career Programs†	*20,587*	*2.1*
Training Programs	39,778	4.0
Research and Development Contracts	71,481	7.3
Total, Heart and Vascular Diseases	**$983,840**	**100%**

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

NHLBI Epidemiology and Clinical Applications Program Obligations by Funding Mechanism: Fiscal Year 2001

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	$132,957	65.6%
Specialized Centers of Research (SCORs)	—	—
Other Research Grants	11,497	5.7
*Research Career Programs**	*8,095*	*4.0*
Training Programs	4,535	2.2
Research and Development Contracts	53,810	26.5
Total, Epidemiology and Clinical Applications	**$202,799**	**100%**

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

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

NHLBI Lung Diseases Program
Obligations by Funding Mechanism: Fiscal Year 2001

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	$345,110	77.7%
Specialized Centers of Research (SCORs)	39,031	8.8
Other Research Grants	32,608	7.3
*Research Career Programs**	*18,483*	*4.2*
Training Programs	16,168	3.6
Research and Development Contracts	10,993	2.5
Total, Lung Diseases	**$443,910**	**100%**

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

NHLBI Blood Diseases and Resources Program
Obligations by Funding Mechanism: Fiscal Year 2001

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	$278,579	76.5%
Specialized Centers of Research (SCORs)	15,318	4.2
Sickle Cell Centers	18,144	5.0
Centers for AIDS Research	2,427	0.7
Other Research Grants	13,164	3.6
*Research Career Programs**	*8,323*	*2.3*
Training Programs	11,769	3.2
Research and Development Contracts	24,572	6.8
Total, Blood Diseases and Resources Program	**$363,973**	**100%**

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

National Center on Sleep Disorders Research Program
Obligations by Budget Mechanism: Fiscal Year 2001

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	$28,720	77.6%
Specialized Centers of Research (SCORs)	4,825	13.0
Other Research Grants	1,981	5.4
*Research Career Programs**	*1,981*	*5.4*
Training Programs	1,468	4.0
Research and Development Contracts	—	—
Total, Sleep Disorders Research	**$36,994**	**100%**

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

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

Women's Health Initiative
Obligations by Funding Mechanism: Fiscal Year 2001

Funding Mechanism	Obligated Dollars (Thousands)	Percent of Program Budget
Research Project Grants	$ —	—
Specialized Centers of Research (SCORs)	—	—
Other Research Grants	—	—
*Research Career Programs**	—	—
Training Programs	—	—
Research and Development Contracts	59,200	100
Total, Women's Health Initiative	**$59,200**	**100%**

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

8. Long-Term Trends

Budget History of the NHLBI: Fiscal Years 1951-2001

Dollars (Thousands)

Fiscal Year	Budget Estimate to Congress	House Allowance	Senate Allowance	Appropriation	Obligations	Cumulative Fiscal Year Obligations
1951	$ 8,800	$ 8,800	$ 9,400	$ 9,400	$ 8,497	$ 24,265
1952	10,237	10,074	10,156	10,083	9,850	34,115
1953	9,779	9,623	12,000	12,000	11,398	45,513
1954	11,040	12,000	15,418	15,168	14,952	60,465
1955	14,570	16,168	17,168	16,668	16,595	77,060
1956	17,454	17,398	23,976	18,808	18,838	95,898
1957	22,106	25,106	33,396	33,396	32,392	128,290
1958	33,436	33,436	38,784	35,936	35,973	164,263
1959	34,820	36,212	49,529	45,613	45,468	209,731
1960	45,594	52,744	89,500	62,237	61,565	271,296
1961	63,162	71,762	125,166	86,900	86,239	357,535
1962	97,073	105,723	160,000	132,912	110,849	468,384
1963	126,898	143,398	149,498	147,398	120,597	588,981
1964	130,108	129,325	130,545	132,404	117,551	706,532
1965	125,640	124,521	125,171	124,824	124,412	830,944
1966	141,412	146,212	143,462	141,462	141,171	972,115
1967	148,407	154,770	164,770	164,770	164,342	1,136,457
1968	167,954	167,954	177,954	167,954	162,134	1,298,591
1969	169,735	164,120	172,120	166,928	161,834	1,460,425
1970	160,513	160,513	182,000	171,257	160,433	1,620,858
1971	171,747	178,479	203,479	194,901	194,826	1,815,684
1972	195,492	211,624	252,590	232,627	232,577	2,048,261
1973	255,280	300,000	350,000	300,000	255,722	2,303,983
1974	265,000	281,415	320,000	302,915	327,270	2,631,253
1975	309,299	321,196	330,000	327,996	327,953	2,959,206
1976	324,934	329,079	379,059	370,096	368,648	3,327,854
TQ[A]	59,715	58,015	58,015	58,763	60,639	3,388,493
1977	342,855	380,661	420,661	396,661	396,857	3,785,350
1978	403,642	432,642	456,000	447,901	447,968	4,233,318
1979	454,336	485,584	485,584	510,134	510,080	4,743,398
1980	507,344	527,544	527,544	527,544	527,248	5,270,646
1981	532,799	560,264	565,264	549,693	550,072	5,820,718
1982	579,602	583,831	587,741	559,637	559,800	6,380,518
1983	577,143	620,947	624,542	624,259	624,260	7,004,778
1984	639,774	665,859	683,489	704,939	705,064	7,709,842
1985	718,852	764,135	807,149	805,269	803,810	8,513,652
1986	775,254	856,388	863,652	859,239	821,901	9,335,553
1987	785,697	921,410	921,502	930,001	929,982	10,265,535
1988	821,887	990,808	1,000,349	965,536	965,283	11,230,818
1989	1,054,503	1,018,983	1,056,003	1,045,985	1,045,508	12,276,326
1990	1,039,846	1,090,930	1,091,597	1,072,354	1,070,683	13,347,009
1991	1,112,502	1,135,589	1,137,235	1,126,942	1,125,915	14,472,924
1992	1,209,924	1,202,398	1,190,396	1,191,500	1,190,070	15,662,994
1993	1,245,396	1,228,455	1,228,455	1,214,693	1,214,693	16,877,687
1994	1,198,402	1,277,880	1,277,880	1,277,880	1,277,852	18,155,539
1995	1,266,961	1,259,590	1,259,590	1,258,472	1,314,969	19,470,508
1996	1,337,021	1,355,866	1,320,254[B]	1,355,866	1,351,422[C]	20,821,930
1997	1,320,555[D]	1,438,265	1,344,742[D]	1,432,529[E]	1,431,821	22,253,751
1998	1,467,189	1,513,004	1,531,898	1,531,061[F]	1,526,276	23,780,027
1999	1,709,328[G]	1,720,344	1,793,697	1,793,697[H]	1,788,008	25,568,035
2000	1,759,806	1,937,404	2,001,185	2,040,291[I]	2,027,286	27,595,321
2001	2,069,582	2,328,102	2,328,102	2,299,866[J]	2,298,035	29,893,356

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

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

C Obligations reflect the Institute share of the government-wide rescission, the HHS rescission, and a transfer to other NIH Institutes through the NIH Director's 1 percent transfer authority.

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

E Excludes enacted administrative reduction.

F Excludes $321,000 Director Transfer; $2,856,000 Secretary Transfer; and $1,600,000 Director Rescission.

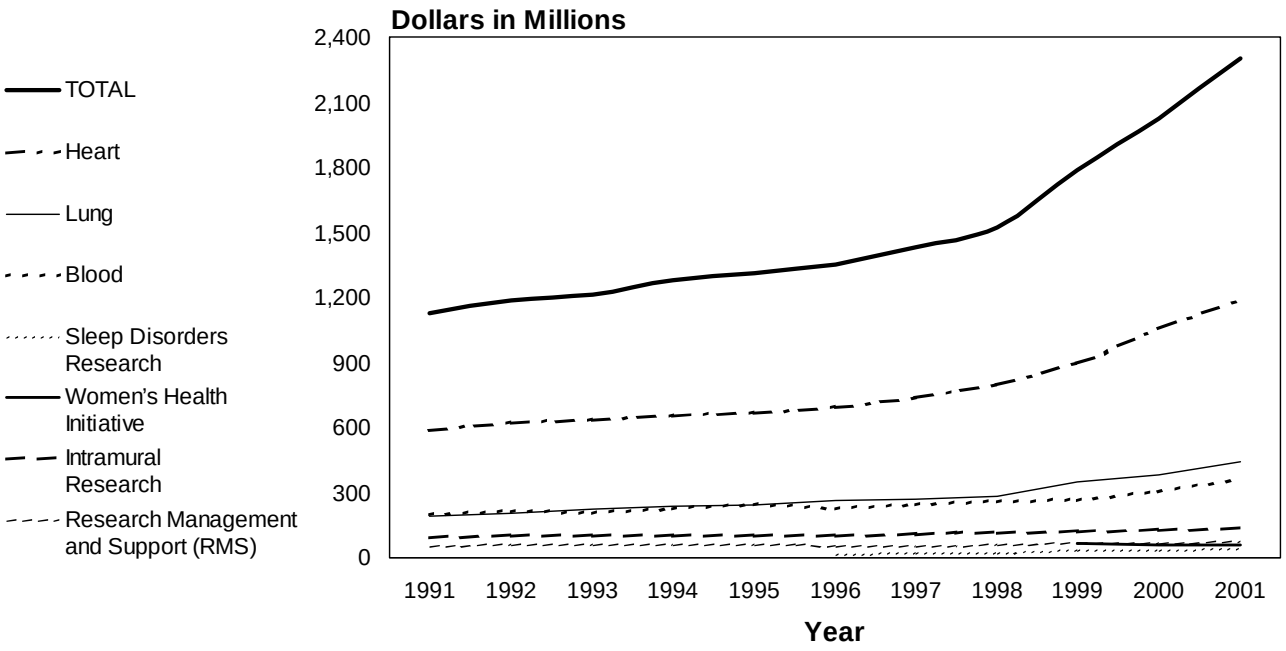
G Includes $5,161,000 Bioterrorism reduction.

H Excludes $3,840,000 Director Transfer; $571,000 Secretary Transfer; and $1,188,000 Director Rescission.

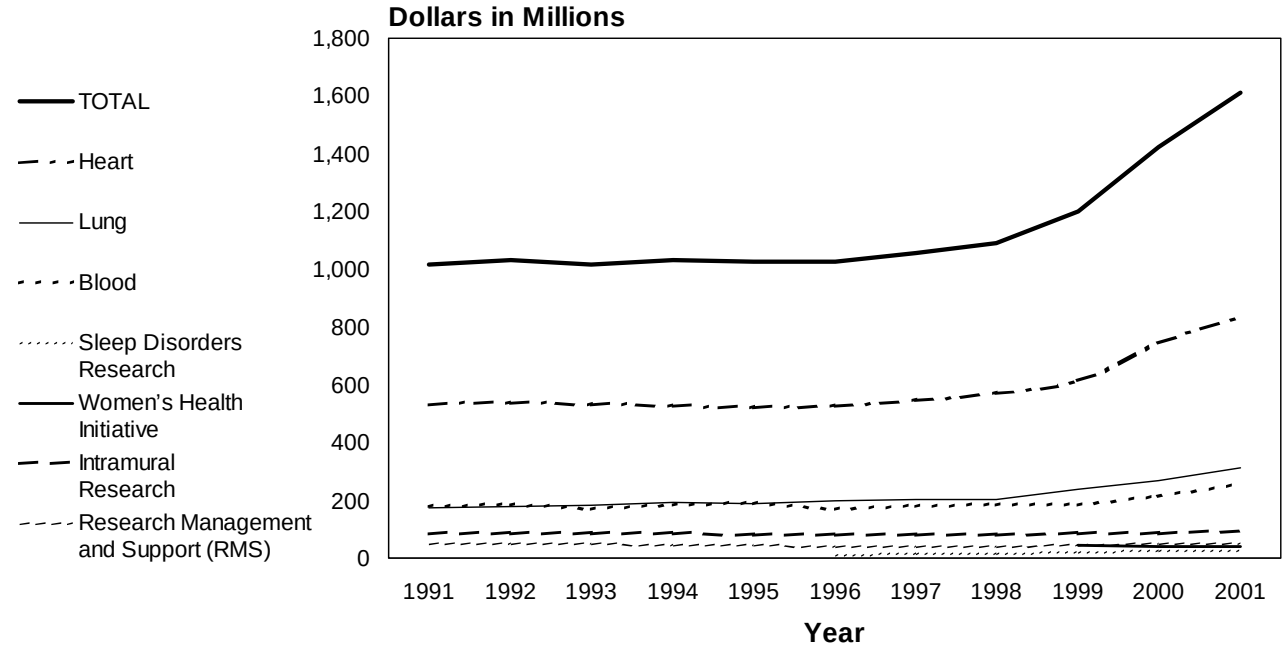
I Excludes $1,701,000 Director Transfer; $424,000 Secretary Transfer; and $10,867,000 Rescission.

J Excludes $479,000 transfer to Office of Human Research Protection; $436,000 Secretary Transfer; and $875,000 Rescission.

NHLBI Total Obligations by Budget Category: Fiscal Years 1991-2001
Current Dollars



NHLBI Total Obligations by Budget Category: Fiscal Years 1991-2001
Constant 1991 Dollars



NHLBI Total Obligations by Budget Category: Fiscal Years 1991-2001

Current Dollars (Millions)

	Fiscal Year										
Budget Category	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Extramural Research											
Heart	$ 589.6	$ 619.5	$ 632.0	$ 651.7	$ 668.9	$ 692.8	$ 737.9	$ 795.6	$ 898.0	$1,058.0	$1,186.6
Lung	193.8	203.4	221.6	238.7	243.0	261.9	273.4	281.7	346.2	380.4	444.0
Blood	195.9	211.9	203.5	227.4	244.6	224.3	242.7	257.5	266.1	305.9	364.0
Sleep Disorders Research	—	—	—	—	—	15.9	18.7	22.3	31.2	35.1	37.0
Women's Health Initiative	—	—	—	—	—	—	—	—	63.1	57.7	59.2
Intramural Research	93.7	97.1	98.2	101.7	98.9	101.8	104.4	111.6	119.5	122.3	133.7
Research Management and Support (RMS)	52.9	58.2	59.4	58.4	59.5	54.8	54.6	57.6	63.9	67.9	73.5
Total	**$1,125.9**	**$1,190.1**	**$1,214.7**	**$1,277.9**	**$1,314.9**	**$1,351.5**	**$1,431.7**	**$1,526.3**	**$1,788.0**	**$2,027.3**	**$2,298.0**

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

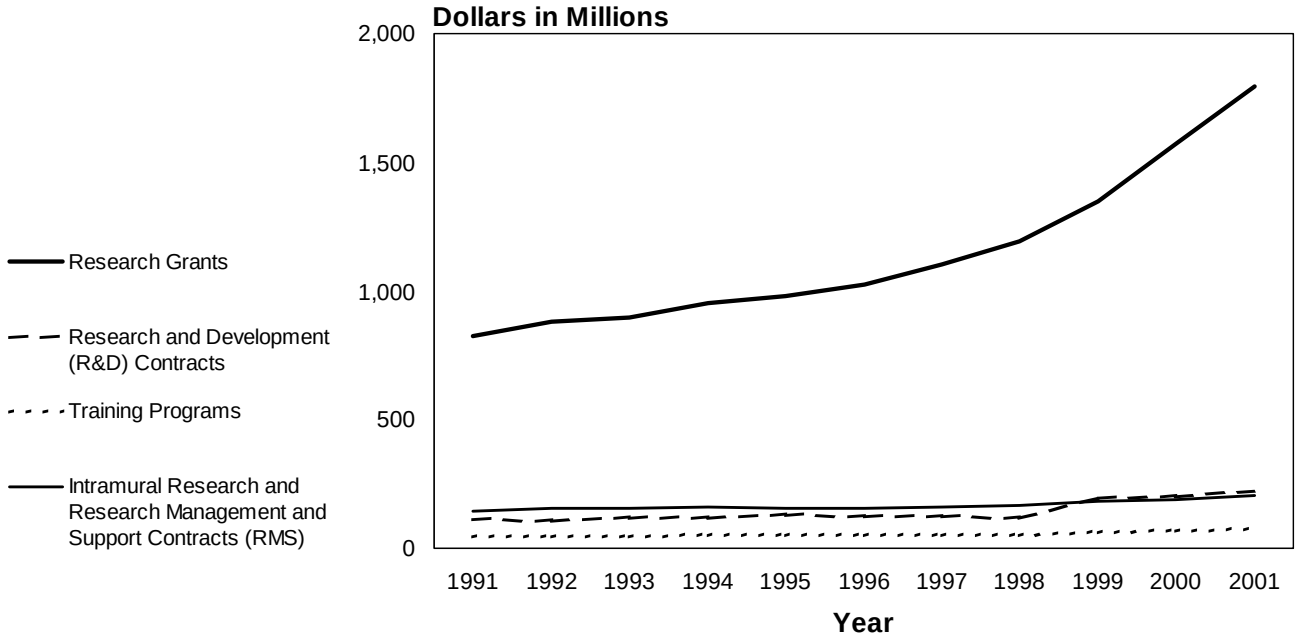
NHLBI Total Obligations by Budget Category: Fiscal Years 1991-2001

Constant 1991 Dollars (Millions)

	Fiscal Year										
Budget Category	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999***	**2000**	**2001**
Extramural Research											
Heart	$ 589.6	$ 593.5	$ 585.2	$ 581.3	$ 576.6	$ 582.0	$ 603.6	$ 629.3	$ 685.2	$ 773.4	$ 831.8
Lung	193.8	194.9	205.2	212.9	209.5	220.0	223.6	222.8	264.2	278.1	311.2
Blood	195.9	203.0	188.4	202.8	210.8	188.4	198.5	203.7	203.0	223.6	255.2
Sleep Disorders Research	—	—	—	—	—	13.4	15.3	17.6	23.8	25.7	25.9
Women's Health Initiative	—	—	—	—	—	—	—	—	48.1	42.2	41.5
Intramural Research	93.7	93.0	90.9	90.7	85.3	85.5	85.4	88.3	91.2	89.4	93.7
Research Management and Support (RMS)	52.9	55.8	55.0	52.1	51.3	46.0	44.7	45.6	48.8	49.6	51.5
Total	**$1,125.9**	**$1,140.2**	**$1,124.7**	**$1,139.8**	**$1,133.5**	**$1,135.3**	**$1,171.1**	**$1,207.3**	**$1,364.3**	**$1,482.0**	**$1,610.8**

* 2.8% Inflation Factor used to calculate FY 1999.
This table is based on the Biodmedical Research & Development Price Index (January 2001).
Note: Numbers may not add to total due to rounding.

NHLBI Total Obligations by Budget Mechanism: Fiscal Years 1991-2001



NHLBI Total Obligations by Budget Mechanism: Fiscal Years 1991-2001

Current Dollars (Millions)

	Fiscal Year										
Funding Mechanism	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Research Grants*	$ 824.9	$ 880.4	$ 895.3	$ 951.2	$ 982.6	$1,025.4	$1,100.9	$1,189.8	$1,346.6	$1,570.5	$1,796.9
Research and Development (R&D) Contracts	108.7	107.7	117.5	118.3	125.9	120.9	121.9	116.7	197.2	201.3	220.1
Training Programs	45.8	46.7	44.3	48.3	48.0	48.5	49.8	50.6	60.8	65.4	73.7
Intramural Research and Research Management and Support (RMS)†	146.5	155.3	157.6	160.1	158.4	156.6	159.1	169.2	183.4	190.1	207.3
Total	**$1,125.9**	**$1,190.1**	**$1,214.7**	**$1,277.9**	**$1,314.9**	**$1,351.4**	**$1,431.7**	**$1,526.3**	**$1,788.0**	**$2,027.3**	**$2,298.0**

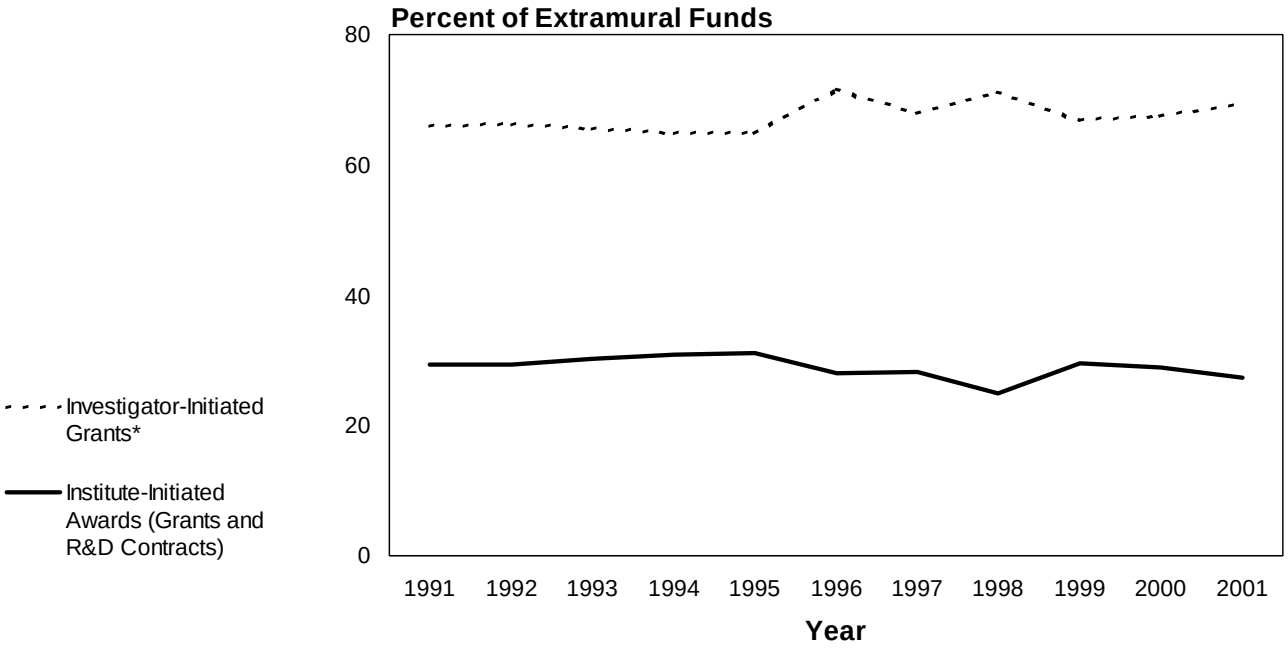
* Includes Research Career Programs.
† Excludes Office of the Director and DIR research contracts, which are included in R&D contracts.

NHLBI Employment: Fiscal Years 1991-2001

	Fiscal Year										
Staff	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
FTEs*	891	931	911	854	822	834	829	840	847	865	868

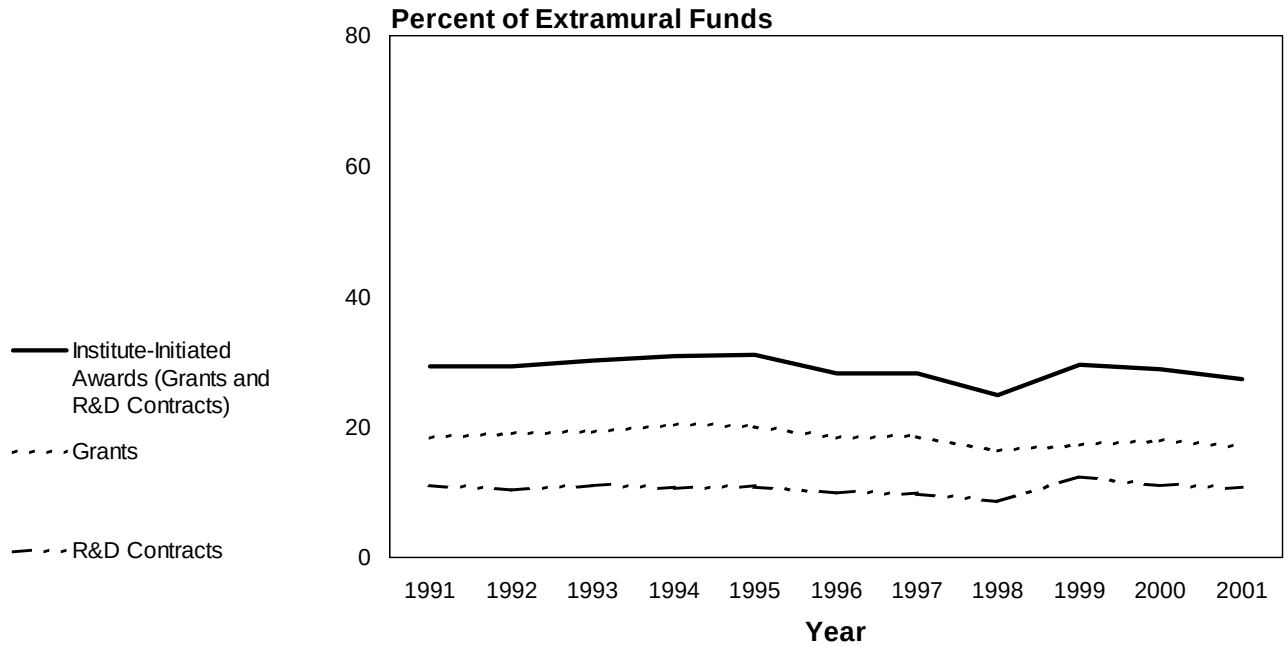
* Full-time equivalents.

NHLBI Institute-Initiated and Investigator-Initiated Awards: Fiscal Years 1991-2001



* Includes Research Career Programs.

NHLBI Grants and Research and Development Contracts as Subsets of Institute-Initiated Awards: Fiscal Years 1991-2001



NHLBI Extramural Programs: Fiscal Years 1991-2001

Dollars (Millions)

	Fiscal Year										
Funding Mechanism	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Investigator-Initiated Awards											
Investigator-Initiated Grants*	$616.3	$ 654.8	$ 663.2	$ 669.7	$ 725.0	$ 815.5	$ 835.3	$ 930.5	$1,023.6	$1,188.6	$1,388.8
Research Career Programs	22.8	23.0	23.1	25.1	25.7	28.9	28.9	36.1	46.3	53.0	57.5
Subtotal, Investigator-Initiated Awards	639.1	677.8	686.3	694.8	750.7	844.4	864.2	966.6	1,069.9	1,241.6	1,446.3
Institute-Initiated Awards											
Institute-Initiated Grants (RFA)	185.8	202.6	209.0	226.4	231.9	216.8	236.8	223.2	276.7	328.9	350.7
Centers†	*92.2*	*96.5*	*96.6*	*101.5*	*107.0*	*87.5*	*87.7*	*114.4*	*119.9*	*123.8*	*127.2*
R&D Contracts (RFP)	108.7	107.7	117.5	118.3	125.9	116.7	121.9	116.7	197.2	201.3	220.1
Subtotal, Institute-Initiated Awards	294.5	310.3	326.5	344.7	357.8	333.5	358.7	339.9	473.9	530.2	570.8
Training											
Individual Awards	5.9	6.3	6.2	7.2	7.1	7.3	6.8	7.6	9.2	8.9	8.9
Institutional Awards	39.5	39.9	37.2	40.0	40.0	40.2	42.0	42.0	50.3	55.2	63.4
Subtotal, Training‡	45.8	46.7	44.3	48.2	48.0	48.5	49.8	50.6	60.8	65.4	73.7
Total, Extramural	**$979.4**	**$1,034.8**	**$1,057.1**	**$1,087.7**	**$1,156.5**	**$1,226.4**	**$1,272.7**	**$1,357.1**	**$1,604.6**	**$1,837.2**	**$2,090.8**

* Includes all R18s.
† Centers are a subset of Institute-Initiated Grants (RFAs), and are not added to the Institute-Initiated Awards subtotal as a distinct category.
‡ Numbers do not add to subtotal because line-items exclude NIH assessments.

NHLBI Extramural Programs: Fiscal Years 1991-2001

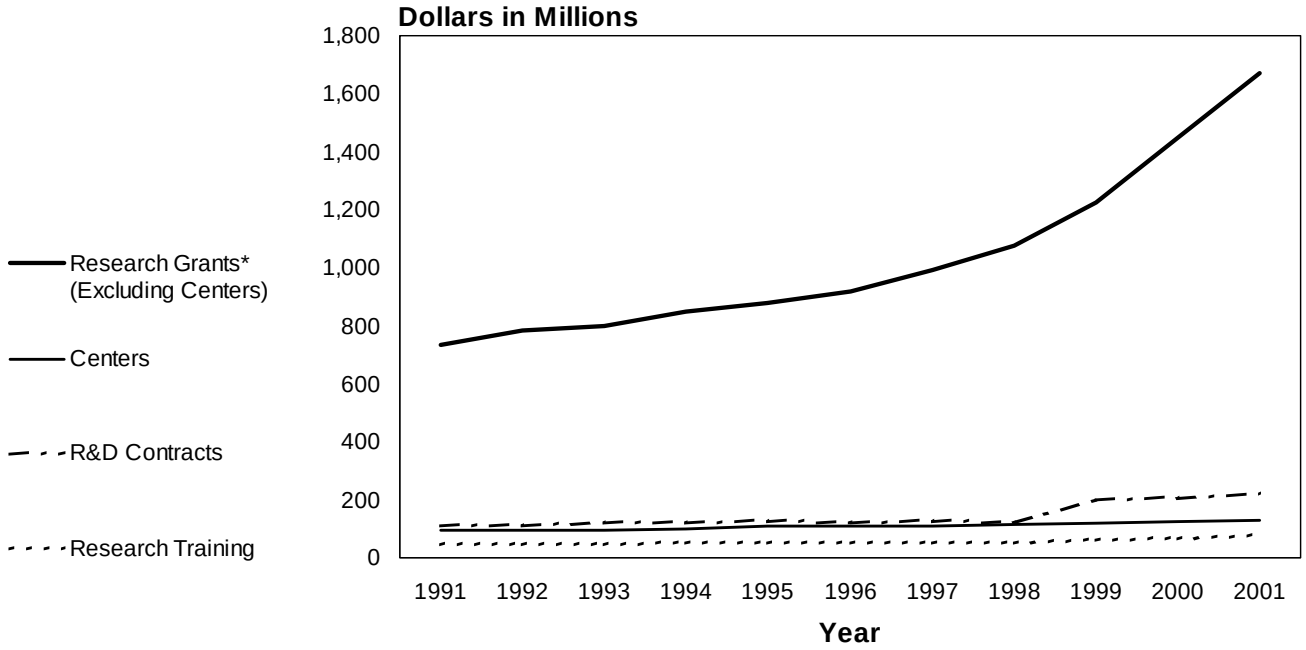
Percent of Total Extramural Budget

	Fiscal Year										
Funding Mechanism	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Investigator-Initiated Awards											
Investigator-Initiated Grants*	62.9%	63.3%	62.7%	61.6%	62.7%	66.5%	65.6%	68.6%	63.8%	64.7%	66.4%
Research Career Programs (K04, K06)	2.3	2.2	2.2	2.3	2.2	2.4	2.3	2.7	2.9	2.9	2.8
Subtotal, Investigator-Initiated Awards	65.3	65.5	64.9	63.9	64.9	68.9	67.9	71.2	66.7	67.6	69.2
Institute-Initiated Awards											
Institute-Initiated Grants (RFA)	19.0	19.6	19.8	20.8	20.1	17.7	18.6	16.4	17.2	17.9	16.8
Centers†	*9.4*	*9.3*	*9.1*	*9.3*	*9.3*	*7.1*	*6.9*	*8.4*	*7.5*	*6.7*	*6.1*
R&D Contracts (RFP)	11.1	10.4	11.1	10.9	10.9	9.5	9.6	8.6	12.3	11.0	10.5
Subtotal, Institute-Initiated Awards	30.1	30.0	30.9	31.7	30.9	27.2	28.2	25.0	29.5	28.9	27.3
Training											
Individual Awards	0.6	0.6	0.6	0.7	0.6	0.6	0.5	0.6	0.6	0.5	0.4
Institutional Awards	4.0	3.9	3.5	3.7	3.5	3.3	3.3	3.1	3.1	3.0	3.0
Subtotal, Training‡	4.7	4.5	4.2	4.4	4.2	4.0	3.9	3.7	3.8	3.6	3.5
Total, Extramural	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

* Includes all R18s.
† Centers are a subset of Institute-Initiated Grants (RFAs), and are not added to the Institute-Initiated Awards subtotal as a distinct category.
‡ Numbers do not add to subtotal because line-items exclude NIH assessments.

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

NHLBI Extramural Research Funding Mechanism: Fiscal Years 1991-2001



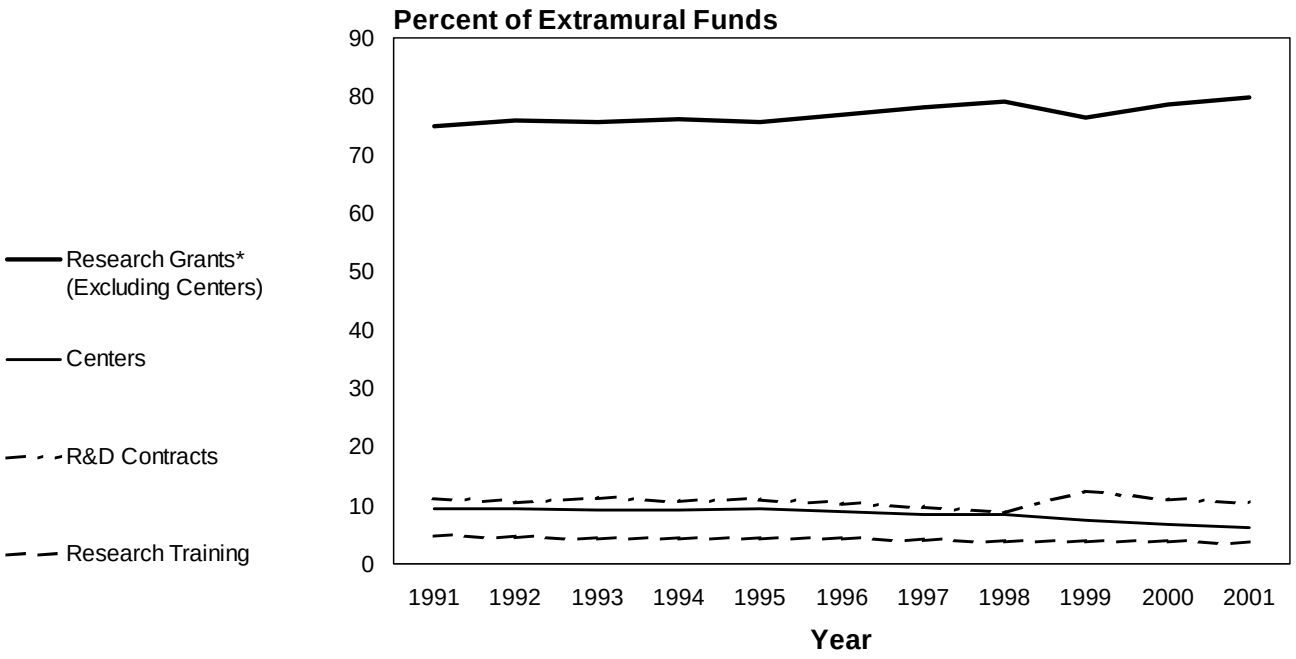
NHLBI Extramural Research Funding Mechanism: Fiscal Years 1991-2001

Dollars (Millions)

	Fiscal Year										
Funding Mechanism	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Research Grants*	$732.7	$ 783.9	$ 798.7	$ 849.7	$ 875.7	$ 918.7	$ 992.3	$1,075.4	$1,226.7	$1,446.7	$1,669.8
Centers	92.2	96.5	96.6	101.5	107.0	106.7	108.7	114.4	119.9	123.8	127.2
R&D Contracts	108.7	107.7	117.5	118.3	125.9	120.9	121.9	116.7	197.2	201.3	220.1
Research Training	45.8	46.7	44.3	48.2	48.0	48.5	49.8	50.6	60.8	65.4	73.7
Total, Extramural	**$979.4**	**$1,034.8**	**$1,057.1**	**$1,117.7**	**$1,156.6**	**$1,194.8**	**$1,272.7**	**$1,357.1**	**$1,604.6**	**$1,837.2**	**$2,090.8**

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

NHLBI Extramural Research Funding Mechanism: Fiscal Years 1991-2001



NHLBI Extramural Research Funding Mechanism: Fiscal Years 1991-2001

Percent of Total Extramural Budget

	Fiscal Year										
Funding Mechanism	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Research Grants*	74.8%	75.8%	75.6%	76.0%	75.7%	76.9%	78.0%	79.2%	76.4%	78.7%	79.9%
Centers	9.4	9.3	9.1	9.1	9.3	8.9	8.5	8.4	7.5	6.7	6.1
R&D Contracts	11.1	10.4	11.1	10.6	10.9	10.1	9.6	8.6	12.3	11.0	10.5
Research Training	4.7	4.5	4.2	4.3	4.2	4.1	3.9	3.7	3.8	3.6	3.5
Total, Extramural	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

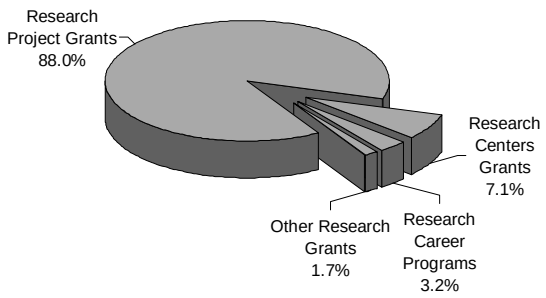
* Includes Research Career Programs; does not include Centers.
Note: Numbers may not add to total due to rounding.

9. Research Grants

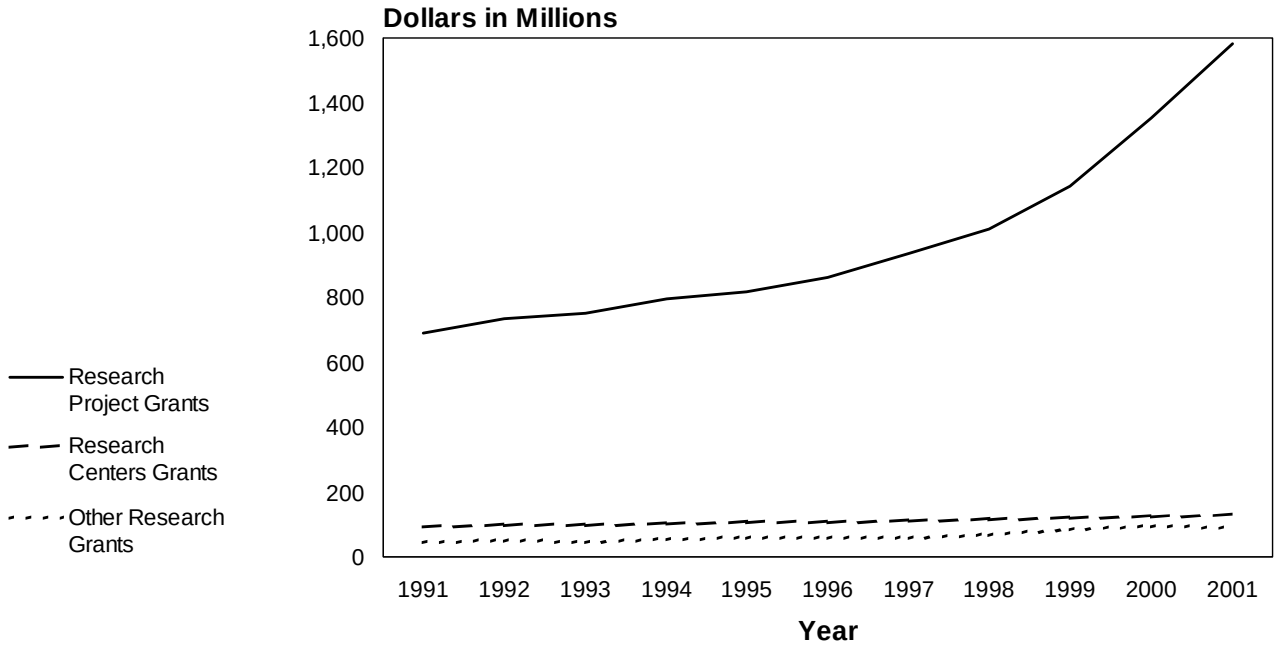
NHLBI Research Grants by Funding Mechanism: Fiscal Year 2001

	Number of Grants	Total Cost (Dollars in Thousands)	Percent of Total NHLBI Research Grant Dollars
Research Project Grants (RPGs)			
Research Project Grants (Excluding Small Business RPGs)			
Regular Research Grants (R01)	3,288	$1,041,981	57.99%
Small Research Grants (R03)	15	1,087	0.06
Program Project Grants (P01)	174	286,358	15.94
Cooperative Agreements (U01)	205	153,156	8.52
Area Grants (R15)	1	2	—
Explorative Developmental Grant (R21)	14	2,648	0.15
Transition Award (R29)	67	7,254	0.40
Method to Extend Research in Time (R37)	92	32,867	1.83
Exploratory/Developmental Grants Phase II (R33)	2	464	0.03
Subtotal, Research Project Grants (Excluding Small Business RPGs)	3,852	1,525,817	84.91
Small Business Research Project Grants			
Small Business Technology Transfer (STTR Phase I) (R41)	9	1,020	0.06
Small Business Technology Transfer (STTR Phase II) (R42)	7	2,377	0.13
Small Business Innovation Research (SBIR Phase I) (R43)	106	13,085	0.73
Small Business Innovation Research (SBIR Phase II) (R44)	92	38,452	2.14
Subtotal, Small Business Research Project Grants	214	54,934	3.06
Subtotal, Research Project Grants	4,066	1,580,751	87.97
Research Center Grants			
Exploratory Grants (P20)	1	782	0.04
Specialized Centers of Research (SCOR) (P50)	68	105,754	5.89
Animal Model and Animal and Biological Material Resource Grants (P40)	—	125	0.01
Sickle Cell Centers (P60)	10	18,144	1.01
Centers for AIDS Research (P30)	—	2,427	0.14
Subtotal, Research Center Grants	79	127,232	7.08
Research Career Programs			
Mentored Research Development Award for Minority Faculty (K01)	44	5,556	0.31
Minority Institution Faculty Mentored Research Scientist Award (K01)	9	1,143	0.06
Independent Scientist Award (K02)	34	3,203	0.18
Research Career Award (K06)	2	70	—
Nutrition Academic Award (K07)	19	2,869	0.16
Tuberculosis Academic Award (K07)	5	396	0.02
Sleep Academic Award (K07)	12	1,081	0.06
Clinical Investigator Scientist Award (K08)	241	29,263	1.63
Minority School Faculty Development Award (K14)	1	98	0.01
Mentored Patient-Oriented Research Career Development Award (K23)	58	7,570	0.42
Midcareer Investigator Award in Patient-Oriented Research (K24)	27	2,877	0.16
Mentored Quantitative Research Career Development Award (K25)	2	272	0.02
Clinical Research Curriculum Award (K30)	55	3,073	0.17
Subtotal, Research Career Programs	509	57,470	3.20
Other Research Grants			
Cooperative Clinical Research (U10, R10)	25	13,921	0.77
Minority Biomedical Research Support (S06, S14)	—	3,165	0.18
Other (R09, R13, R18, R24, R25, T15, U09, U24, UH1)	41	14,402	0.80
Subtotal, Other Research Grants	66	31,488	1.75
Total, NHLBI Research Grants	**4,720**	**$1,796,941**	**100%**

NHLBI Total Research Grants by Category



NHLBI Research Project Grant,* Research Centers Grant, and Other Research Grant Obligations: Fiscal Years 1991-2001



NHLBI Research Project Grant,* Research Centers Grant, and Other Research Grant Obligations: Fiscal Years 1991-2001

Dollars (Thousands)

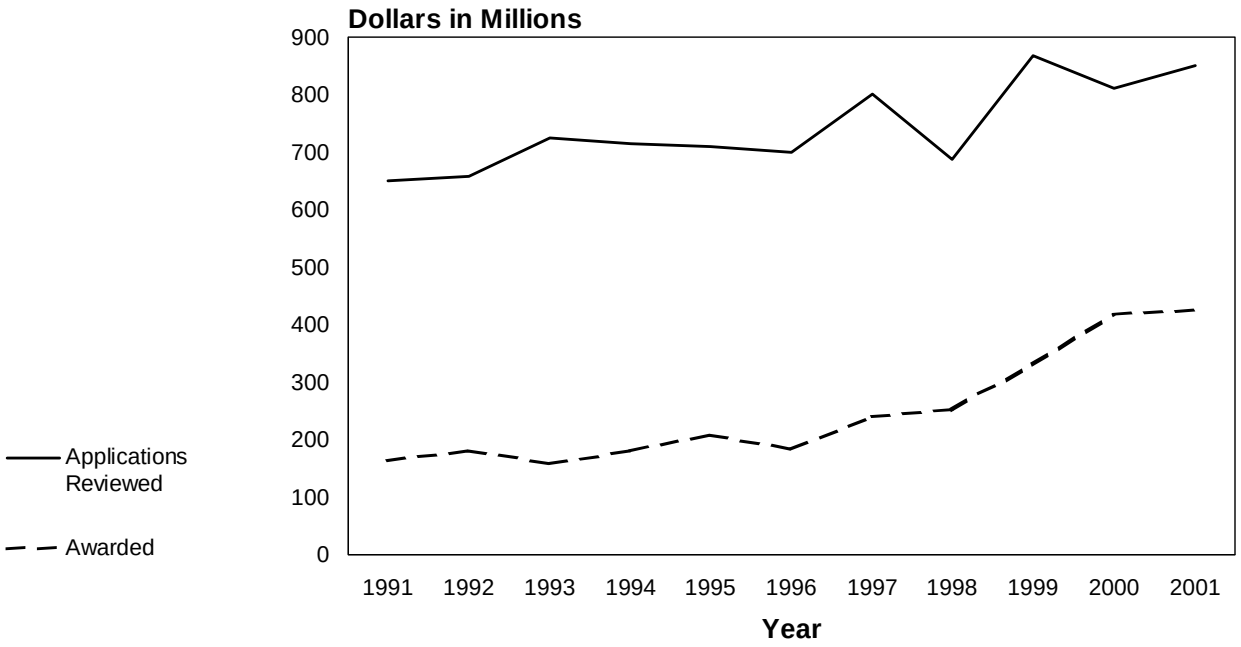
	Fiscal Year										
	1991	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Research Project Grants*	$688,330	$736,232	$752,978	$797,092	$819,674	$862,027‡	$935,322	$1,009,152	$1,142,473	$1,356,034	$1,580,751
Research Centers Grants	92,174	96,510	96,628	101,535	106,980	106,688	108,665	114,397	119,889	123,803	127,232
Other Research Grants†	44,387	47,656	45,654	52,576	55,974	56,692	56,993	66,234	84,219	90,666	88,958
Total	**$824,891**	**$880,398**	**$895,260**	**$951,203**	**$982,628**	**$163,380**	**$1,100,980**	**$1,189,783**	**$1,346,581**	**$1,570,503**	**$1,796,941**

* Includes R01, U01, P01, R29, R37, R43, and R44; R03 and R41 beginning in 1994; R55 in 1995 and 1996; R42 beginning in 1996; R21 beginning in 1997; and R23 beginning in 2001.

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

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

NHLBI Competing Research Project Grant Applications*: Fiscal Years 1991-2001
Total Cost Dollars Reviewed and Awarded



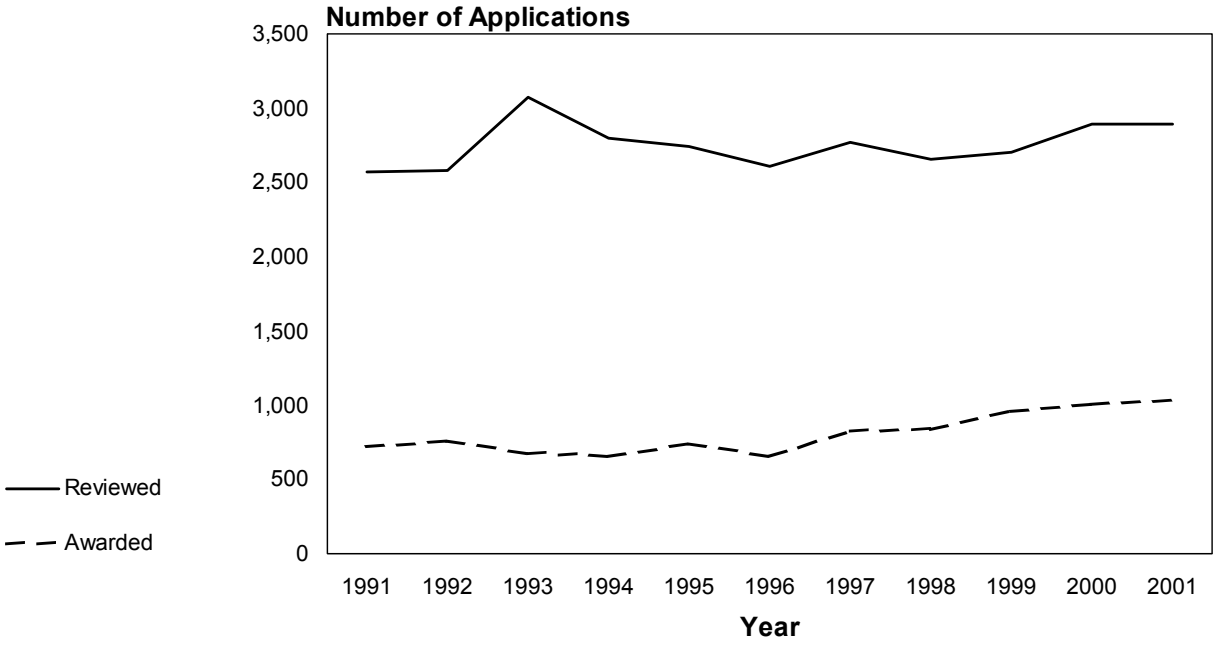
NHLBI Competing Research Project Grant Applications*: Fiscal Years 1991-2001
Total Cost Dollars Reviewed and Awarded

	Dollars (Millions)										
	Fiscal Year										
	1991	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Applications Reviewed	$650.8	$658.4	$724.3	$715.0	$710.3	$699.2	$802.1	$687.1	$867.1	$809.8	$851.7
Awarded	$162.8	$181.3	$158.0	$180.4	$207.5	$182.1	$240.1	$252.4	$330.4	$418.4	$424.3

* Includes R01, U01, P01, R29, R37, R43, and R44; R03 and R41 beginning in 1994; R55 in 1995 and 1996; R42 beginning in 1996; R21 beginning in 1997; and R23 beginning in 2001.

NHLBI Competing Research Project Grant Applications*: Fiscal Years 1991-2001

Number Reviewed and Awarded

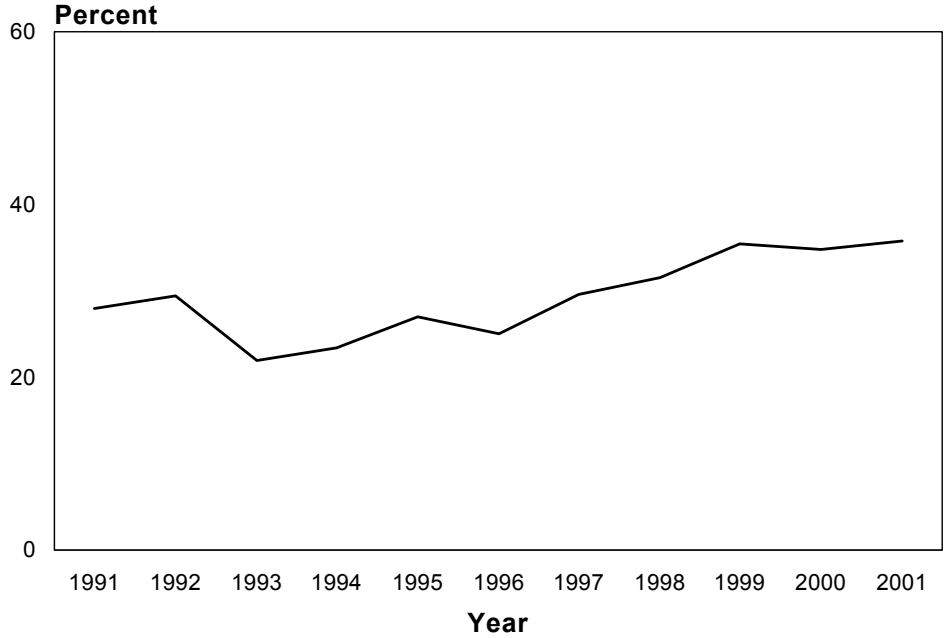


Number Reviewed and Awarded and Percent Funded

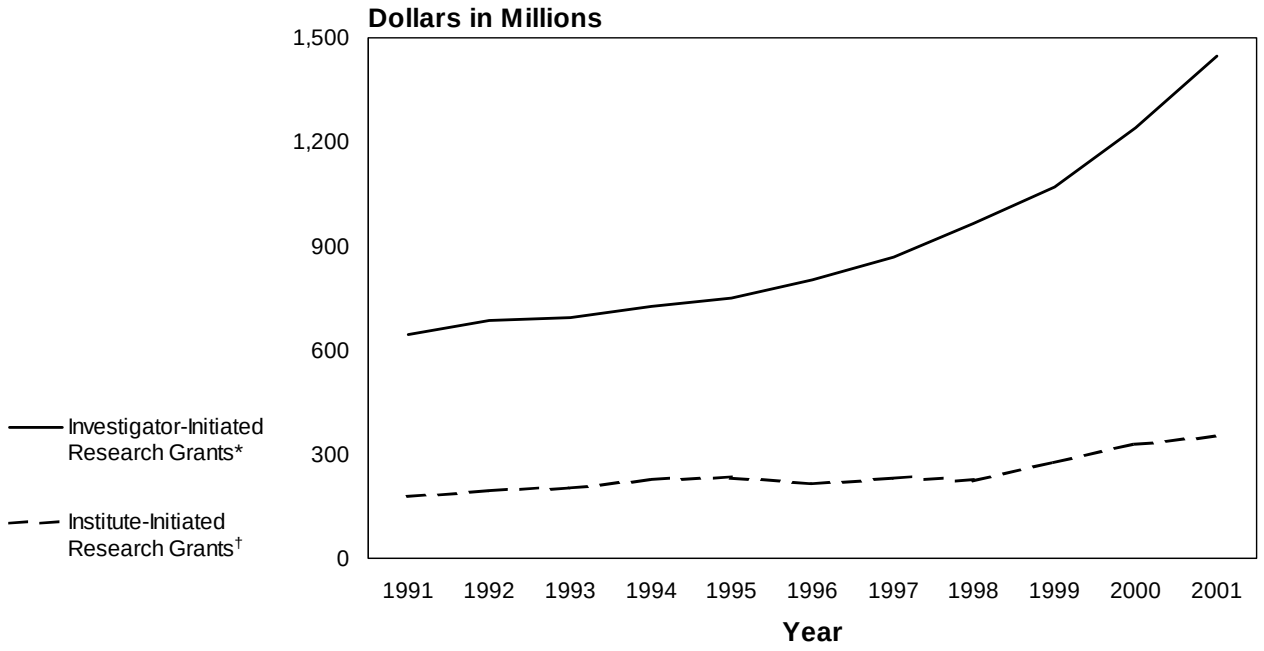
	Fiscal Year										
	1991	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Applications Reviewed	2,571	2,580	3,072	2,801	2,744	2,605	2,771	2,657	2,704	2,893	2,895
RPGs Awarded	717	759	673	655	740	652	821	837	959	1,007	1,033
Success Rate (percent)	27.9	29.4	21.9	23.4	27.0	25.0	29.6	31.5	35.5	34.8	35.7

* Includes R01, U01, P01, R29, R37, R43, and R44; R03 and R41 beginning in 1994; R55 in 1995 and 1996; R42 beginning in 1996; R21 beginning in 1997; and R23 beginning in 2001.

Percent of Reviewed Applications Funded (Success Rate)



NHLBI Investigator-Initiated and Institute-Initiated Grant Obligations: Fiscal Years 1991-2001



NHLBI Investigator-Initiated and Institute-Initiated Grant Obligations: Fiscal Years 1991-2001

Dollars (Millions)

	Fiscal Year										
	1991	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Investigator-Initiated*	$645.8	$683.9	$692.8	$724.8	$750.7	$ 804.1	$ 867.9	$ 966.6	$1,069.9	$1,241.6	$1,446.2
Institute-Initiated†	179.1	196.5	202.5	226.4	231.9	216.8	233	223.2	276.7	328.9	350.7
Total	**$824.9**	**$880.4**	**$895.3**	**$951.2**	**$982.6**	**$1,020.9‡**	**$1,100.9**	**$1,189.8**	**$1,346.6**	**$1,570.5**	**$1,796.9**

* Includes R01, U01, P01, R29, R37, R43, and R44; R03 and R41 beginning in 1994; R55 in 1995 and 1996; R42 beginning in 1996; R21 beginning in 1997; and R23 beginning in 2001.

† Includes Centers Grants and Cooperative Agreement RFAs.

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

NHLBI Research Project Grants*: Amount Funded by Type of Award, Fiscal Years 1991-2001

Dollars (Millions)

	Fiscal Year										
	1991	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Competing											
New Competing	$ 84.0	$ 88.5	$ 89.9	$ 99.7	$111.1	$ 90.5	$135.8	$147.5	$ 202.0	$ 266.4	$ 280.0
Renewal Competing	86.0	101.2	79.1	79.6	94.5	90.4	104	103.9	127.2	152.0	143.9
Competing Supplements	1.6	0.5	0.6	1.1	1.9	1.2	0.3	1.0	1.2	0.9	0.4
Subtotal, Competing	171.6	190.2	169.6	180.4	207.5	182.1	240.1	252.4	330.4	419.3	424.3
Noncompeting											
Subtotal, Noncompeting	516.7	546.0	583.4	599.9	588.4	649.9	662.4	721.3	770.6	889.3	1,101.5
Total, Competing and Noncompeting	**$688.3**	**$736.2**	**$753.0**	**$780.3**	**$795.9**	**$832.0**	**$902.5**	**$973.7**	**$1,101.0**	**$1,308.6**	**$1,525.8**

* Includes R01, U01, P01, R29, R37, R43, and R44; R03 and R41 beginning in 1994; R55 in 1995 and 1996; R42 beginning in 1996; R21 beginning in 1997; and R23 beginning in 2001.

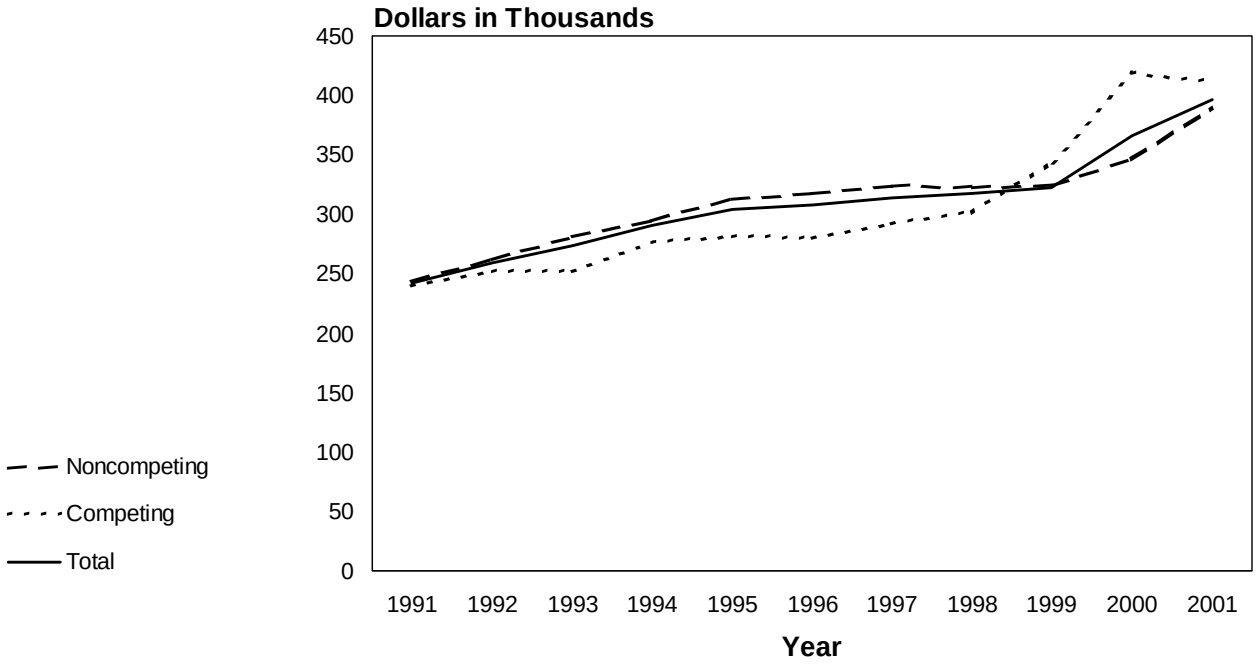
Facility and Administrative (F&A)* Costs of NHLBI Research Project Grants†: Fiscal Years 1991-2001

Dollars (Thousands)

Fiscal Year	Direct Cost	F&A Cost†	Total Cost	F&A Cost as a Percent of Direct Cost
1991	$ 470,623	$217,707	$ 688,330	46.3%
1992	503,076	233,156	736,232	46.3
1993	516,022	236,956	752,978	45.9
1994	534,374	245,965	780,339	46.0
1995	543,502	252,423	795,925	46.4
1996	564,219	267,785	832,004	47.5
1997	611,576	290,915	902,491	47.6
1998	660,009	313,765	973,774	47.5
1999	764,198	336,756‡	1,100,954	44.1
2000	891,244	417,312	1,308,556	46.8
2001	1,045,144	480,673	1,525,817	46.0

* Previously called Indirect Cost.
† Includes R01, U01, P01, R29, R37, R43, and R44; R03 and R41 beginning in 1994; R55 in 1995 and 1996; R42 beginning in 1996; R21 beginning in 1997; and R23 beginning in 2001.
‡ Excludes Program Evaluation Assessment of $1,216,000.

NHLBI Research Project Grants*: Average Costs, Fiscal Years 1991-2001



NHLBI Research Project Grants*: Average Costs, Fiscal Years 1991-2001

Dollars (Thousands)

	Fiscal Year										
	1991	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Noncompeting	$243.2	$261.7	$281.0	$294.8	$312.8	$317.5	$323.0	$322.6	$323.4	$346.6	$390.7
Competing	239.3	251.4	252.0	275.5	280.4	279.3	292.5	301.6	344.5	418.0	410.8
Total	**$242.2**	**$259.0**	**$273.9**	**$290.1**	**$303.7**	**$308.3**	**$314.2**	**$316.9**	**$329.4**	**$366.6**	**$396.1**

* Includes R01, U01, P01, R29, R37, R43, and R44; R03 and R41 beginning in 1994; R55 in 1995 and 1996; R42 beginning in 1996; R21 beginning in 1997; and R23 beginning in 2001.

NHLBI Cooperative Agreements (U01, U10) Programs

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

	Total Obligations Prior to FY 2001	Total FY 2001 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Azithromycin and Coronary Artery Events Study (ACES)	$5,692,173	$720,510	$6,412,683
Bypass Angioplasty Revascularization Investigation (BARI) Data Coordinating Center	49,358,272	1,548,634	50,906,906
Bypass Angioplasty Revascularization Investigation in Type 2 Diabetics (BARI 2D)	3,942,284	6,515,193	10,457,477
Center for Fetal Monkey Gene Transfer for Heart, Lung, and Blood Diseases	—	529,898	529,898
Dietary Patterns, Sodium Intake, and Blood Pressure (DASH Sodium)	10,818,853	150,543	10,969,396
Dynamic Evaluation of Percutaneous Coronary Intervention	2,541,335	655,805	3,197,140
Early Natural History of Arteriosclerosis	4,574,410	1,129,399	5,703,809
Ecologically Guided Bioprospecting in Panama	100,000	50,000	150,000
Estrogen and Graft Atherosclerosis Research Trial	1,630,727	370,606	2,001,333
Family Blood Pressure Program	46,734,015	10,684,639	57,418,654
Genetics of Coronary and Aortic Calcification (GENCAC)	—	3,283,532	3,283,532
Genetics of Coronary Artery Disease in Alaskan Natives (GOCADAN)	1,477,037	1,940,111	3,417,148
Girls Health Enrichment Multisite Studies (GEMS)	4,647,092	2,876,659	7,523,751
Glucose Tolerance and Risk for CVD in the Elderly	1,566,286	275,880	1,842,166
Hematocrit Strategy in Infant Heart Surgery	473,481	556,787	1,030,268
Mode Selection Trial in Sinus Node Dysfunction (MOST)	11,829,311	153,951	11,983,262
Multidisciplinary Study of Right Ventricular Dysplasia	—	1,703,278	1,703,278
Mutations in Developmental Pathways by ENU Mutagenesis	200,000	200,000	400,000
Occluded Artery Trial (OAT)	9,970,722	2,603,528	12,574,250
Pediatric Cardiovascular Clinical Research Network	—	3,447,570	3,447,570
Pharmacogenetics Research Network	—	8,235,472	8,235,472
PREMIER: Lifestyle Interventions for Blood Pressure Control	9,254,211	2,925,232	12,179,443
Programs of Excellence in Gene Therapy	11,354,176	12,044,717	23,398,893
Programs of Genomic Applications for Heart, Lung, and Blood Diseases	37,010,352	36,665,818	73,676,170
Randomized Evaluation of Mechanical Assistance for the Treatment of Congestive Heart Failure (REMATCH)	5,214,402	749,502	5,963,904
Strong Heart Study	27,688,032	5,378,356	33,066,388
Sudden Cardiac Death in Heart Failure (SCD-HeFT)	6,644,649	1,798,508	8,443,157
Trial of Activity for Adolescent Girls (TAAG)	5,273,755	4,831,514	10,105,269
Women's Estrogen/Progestin Lipid Lowering Hormone Atherosclerosis Regression Trial (WELL-HART)	4,903,515	32,300	4,935,815
Women's Ischemia Syndrome Evaluation (WISE)	—	1,502,322	1,502,322
Subtotal, Heart and Vascular Diseases	261,999,090	113,560,264	376,459,354
Lung Diseases			
Asthma Clinical Research Network (ACRN)	35,774,585	5,702,413	41,476,998
Childhood Asthma Research Education (CARE) Network	9,177,140	5,314,414	14,491,554
Collaborative Program in Bronchopulmonary Dysplasia	8,233,645	4,178,240	12,411,885
Collaborative Studies on the Genetics of Asthma (CSGA)	29,295,284	3,550,947	32,846,231
Inhaled Nitric Oxide for the Prevention of Chronic Lung Disease	1,958,793	1,803,405	3,762,198
Inhaled Nitric Oxide in Prevention of Chronic Lung Disease	1,547,602	1,741,773	3,289,375
Linkage Study in Familial Pulmonary Fibrosis	672,789	667,910	1,340,699
Lung Health Study—Long-Term Follow-Up	5,599,356	1,672,052	7,271,408
Lymphangioleiomyomatosis (LAM) Registry	1,651,869	448,206	2,100,075
Pharmacogenetics of Asthma Treatment	2,617,873	2,715,995	5,333,868
Prospective Investigation of Pulmonary Embolism Diagnosis-II (PIOPED II)	2,190,193	3,666,641	5,856,834
Sarcoidosis Genetic Linkage Consortium	3,571,156	1,922,524	5,493,680
Scleroderma Lung Study	2,540,209	1,760,943	4,301,152
Subtotal, Lung Diseases	104,830,494	35,145,463	139,975,957

	Total Obligations Prior to FY 2001	Total FY 2001 Obligations	Total Obligations to Date
Blood Diseases and Resources			
Blood and Marrow Transplant Clinical Research Network	—	5,360,364	5,360,364
Induction of Stable Chimerism for Sickle Cell Anemia	—	489,103	489,103
Reference Laboratory to Evaluate Therapies for SCD	—	433,180	433,180
Sibling Donor Cord Blood Banking and Transplantation	—	1,221,933	1,221,933
Stroke Prevention in Sickle Cell Anemia (STOP II)	4,492,558	3,166,022	7,658,580
Thalassemia Clinical Research Network	2,191,722	2,218,871	4,410,593
Subtotal, Blood Diseases and Resources	6,684,280	12,889,473	13,724,286
National Center for Sleep Disorders Research			
Determinants of Compensatory Sleep Phenotype in Mice	232,874	277,705	510,579
Sleep Heart Health Study	6,596,334	4,692,955	11,289,289
Subtotal, National Center for Sleep Disorders Research	6,829,208	4,970,660	11,799,868
Total, NHLBI Cooperative Agreements	**$380,543,072**	**$166,565,860**	**$547,108,932**

Heart and Vascular Diseases Program

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

The purpose of this study is to determine whether treatment with the antibiotic, azithromycin, for 1 year will reduce the rate of nonfatal myocardial infarction and coronary heart disease deaths over 3 ½ half years in patients with documented coronary artery disease and serologic evidence of past infection with Chlamydia pneumoniae.

Obligations

Funding History:
Fiscal Year 2001—$720,510
Fiscal Years 1998-2000—$5,692,173
Total Funding to Date—$6,412,683

Current Active Organization and Grant Number

1. University of Washington
   Seattle, Washington —HL-58706

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

See Chapter 11. Clinical Trials.

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

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

Obligations

Funding History:
Fiscal Year 2001—$6,515,193
Fiscal Year 2000—$3,942,284
Total Funding to Date—$10,457,477

Current Active Organizations and Grant Numbers

1. University of Pittsburgh
   Pittsburgh, Pennsylvania —HL-61744
2. St. Louis University
   St. Louis, Missouri —HL-61746
3. Stanford University
   Stanford, California —HL-61748
4. University of Vermont
   Burlington, Vermont —HL-63804

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

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

Obligations

Funding History:
Fiscal Year 2001—$529,898
Total Funding to Date—$529,898

Current Active Organization and Grant Number

1. University of California, Davis
   Davis, California —HL-69748

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

The purpose of this study was to compare the effects of three levels of dietary sodium and two patterns of diet (a reference diet and an intervention diet high in fruits, vegetables, and low-fat dairy products and low in fat) on blood pressure in persons with above optimal blood pressure or stage 1 hypertension. Dietary sodium reduction substantially lowered blood pressure in persons with high blood pressure; the greatest effect was seen when sodium reduction was combined with the DASH diet. Major minority representation (57 percent) permitted black versus white comparisons to be made.

Obligations

Funding History:
Fiscal Year 2001—$150,543
Fiscal Years 1997-2000—$10,818,853
Total Funding to Date—$10,969,396

Current Active Organization and Grant Number

1. Kaiser Foundation Research Institute
   Oakland, California —HL-57156

Dynamic Evaluation of Percutaneous Coronary Intervention, Initiated in Fiscal Year 1997

This program, which complements prior NHLBI percutaneous transluminal coronary angioplasty (PTCA) registries and the New Approaches to Coronary Intervention Registry, is evaluating patterns of device usage, as well as immediate and follow-up outcomes in patients undergoing percutaneous transluminal coronary revascularization. Results will provide guidance to the cardiology community in selecting appropriate therapies and in designing clinical trials to evaluate competing devices.

Obligations

Funding History:
Fiscal Year 2001—$655,805
Fiscal Years 1997-2000—$2,541,335
Total Funding to Date—$3,197,140

Current Active Organization and Grant Number

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

Early Natural History of Arteriosclerosis*, Initiated in Fiscal Year 1972

The objectives of this long-term program are to study the impact of genetic factors on the evolution of CVD risk factors in childhood to subsequent subclinical changes (cardiovascular structural and functional characteristics) to ultimately clinical mortality in adulthood and to determine the association of risk factor phenotypes to anatomic changes in the cardiovascular system as seen by necropsy. Genotype/phenotype relationships will be assessed on 1,400 siblings from 17 longitudinal cohorts; 34 percent of the population is black.

Obligations

Funding History:
Fiscal Year 2001—$1,129,399
Fiscal Years 1997-2000†—$4,574,410
Total Funding to Date—$5,703,809

Current Active Organization and Grant Number

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

Ecologically Guided Bioprospecting in Panama, Initiated in Fiscal Year 1999

The objective of this study is to promote conservation and sustainable bioprospecting in Panama via ecological research and to discover new products for medicine and agriculture.

Obligations

Funding History:
Fiscal Year 2001—$50,000
Fiscal Year 1999-2000—$100,000
Total Funding to Date—$150,000

Current Active Organization and Grant Number

1. Smithsonian Institution
   Washington, DC —TW-01021

Estrogen and Graft Atherosclerosis Research Trial, Initiated in Fiscal Year 1996

The purpose of this study is to determine whether HRT administered to women within 4 weeks of coronary bypass surgery reduces occurrence of graft occlusion and delays development of graft atherosclerosis.

Obligations

Funding History:
Fiscal Year 2001—$370,606
Fiscal Years 1996-2000—$1,630,727
Total Funding to Date—$2,001,333

Current Active Organization and Grant Number

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

Family Blood Pressure Program, Initiated in Fiscal Year 1995

The objectives of this program are to identify major genes associated with high blood pressure and to investigate the interactions between genetic and environmental determinants of hypertension in defined populations, many of which consist of specific minority groups. The

* Also known as the Bogalusa Heart Study.
† Became a UO1 in 1997.

study consists of collaborative networks that share technology, data, skills, biological materials, and population resources.

Obligations

Funding History:
Fiscal Year 2001—$10,684,639
Fiscal Years 1995-2000—$46,734,015
Total Funding to Date—$57,418,654

Current Active Organizations and Grant Numbers

1. University of Michigan at Ann Arbor
   Ann Arbor, Michigan —HL-54457
2. University of Mississippi
   Medical Center
   Jackson, Mississippi —HL-54463
3. Mayo Foundation
   Rochester, Minnesota —HL-54464
4. Case Western Reserve University
   Cleveland, Ohio —HL-54466
5. University of Utah
   Salt Lake City, Utah —HL-54471
6. University of Minnesota, Twin Cities
   Minneapolis, Minnesota —HL-54472
7. Washington University
   St. Louis, Missouri —HL-54473
8. University of Texas
   Health Science Center
   Houston, Texas —HL-54481
9. Loyola University Medical Center
   Maywood, Illinois —HL-54485
10. University of Alabama at Birmingham
    Birmingham, Alabama —HL-54495
11. University of Minnesota, Twin Cities
    Minneapolis, Minnesota —HL-54496
12. Boston University
    Boston, Massachusetts —HL-54497
13. Staub Pacific Health Foundation
    Health Research Institute
    Honolulu, Hawaii —HL-54498
14. University of Texas
    Health Science Center
    Houston, Texas —HL-54504
15. Medical College of Wisconsin
    Milwaukee, Wisconsin —HL-54508
16. University of North Carolina
    Chapel Hill, North Carolina —HL-54509
17. University of Michigan at Ann Arbo
    Ann Arbor, Michigan —HL-54512
18. University of Pittsburgh
    Pittsburgh, Pennsylvania —HL-54526
19. Stanford University
    Stanford, California —HL-54527
20. Case Western Reserve University
    Cleveland, Ohio —HL-64777

Genetics of Coronary and Aortic Calcification (GENCAC), Initiated in Fiscal Year 2001

The purpose of this program is to examine vascular calcification and inflammation in patients who have previously been examined and extensively genotyped, in order to identify genetic factors influencing susceptibility to coronary and aortic calcification and individual variability in the inflammatory response. The study includes approximately 600 blacks (275 sibships).

Obligations

Funding History:
Fiscal Year 2001—$3,283,532
Total Funding to Date—$3,283,532

Current Active Organizations and Grant Numbers

1. University of North Carolina
   Chapel Hill, North Carolina —HL-67893
2. University of Utah
   Salt Lake City, Utah —HL-67894
3. Wake Forest University
   Winston Salem, North Carolina —HL-67895
4. Boston University
   Boston, Massachusetts —HL-67896
5. Wake Forest University
   Winston Salem, North Carolina —HL-67897
6. University of Alabama
   Birmingham, Alabama —HL-67898
7. Washington University
   St. Louis, Missouri —HL-67899
8. University of Minnesota, Twin Cities
   Minneapolis, Minnesota —HL-67900
9. University of Minnesota, Twin Cities
   Minneapolis, Minnesota —HL-67901
10. University of Texas
    Health Science Center
    Houston, Texas —HL-67902

Genetics of Coronary Artery Disease in Alaskan Natives (GOCADAN), Initiated in Fiscal Year 2000

The purpose of this study is to document CVD and CVD risk factors in approximately 40 extended families (1,200 members from villages in Northern Alaska). Scientists seek to identify and characterize genes that contribute to CVD in this unique and understudied population.

Obligations

Funding History
Fiscal Year 2001—$1,940,111
Fiscal Year 2000—$1,477,037
Total Funding to Date—$3,417,148

Current Active Organization and Grant Number

1. Medstar Research Institute
Washington, DC —HL-64244

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

See Chapter 11. Clinical Trials.

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

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

Obligations

Funding History:
Fiscal Year 2001—$275,880
Fiscal Years 1997-1999—$1,566,286
Total Funding to Date—$1,842,166

Current Active Organization and Grant Number

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

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

The purpose of this study is to determine which hematocrit level—30 versus 20 percent—provides the optimal degree of hemodilution during infant open heart surgery to repair congenital heart defects. Scientists will compare the effects of the two hematocrit levels with respect to cardiovascular and neurodevelopmental outcomes in the infants during the immediate postoperative period and at 1 year of age.

Obligations

Funding History:
Fiscal Year 2001—$556,787
Fiscal Year 2000—$473,481
Total Funding to Date—$1,030,268

Current Active Organization and Grant Number

1. Children's Hospital, Boston
Boston, Massachusetts —HL-63411

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

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

Obligations

Funding History:
Fiscal Year 2001—$153,951
Fiscal Years 1995-2000—$11,829,311
Funding to Date—$11,983,262

Current Active Organization and Grant Number

1. Duke University
Durham, North Carolina —HL-53973

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

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

Obligations

Funding History
Fiscal Year 2001—$1,703,278
Total Funding to Date—$1,703,278

Current Active Organizations and Grant Numbers

1. University of Arizona
Tucson, Arizona —HL-65594
2. Baylor College of Medicine
Houston, Texas —HL-65652

3. University of Rochester
   Rochester, New York —HL-65961

Mutations in Developmental Pathways by N-Ethyl-N-Nitrosourea (ENU) Mutagenesis, Initiated in Fiscal Year 2000

The purpose of this project is to establish a mouse mutagenesis center to isolate ENU-induced mutations that disrupt developmental pathways. Investigators will screen and characterize lethal mutants that disrupt cardiac and central nervous system/axial development.

Obligations

Funding History:
Fiscal Year 2001—$200,000
Fiscal Year 2000—$200,000
Total Funding to Date—$400,000

Current Active Organization and Grant Number

1. Baylor College of Medicine
   Houston, Texas —HD-39372

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

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

Obligations

Funding History:
Fiscal Year 2001—$2,603,528
Fiscal Year 1999-2000—$9,970,722
Total Funding to Date—$12,574,250

Current Active Organizations and Grant Numbers

1. Duke University
   Durham, North Carolina —HL-62257
2. St. Luke's-Roosevelt Institute for Health Science
   New York, New York —HL-62509
3. Maryland Medical Research Institute
   Baltimore, Maryland —HL-62511

Pediatric Cardiovascular Clinical Research Network, Initiated in Fiscal Year 2001

See Chapter 11. Clinical Trials.

Pharmacogenetics Research Network, Initiated in Fiscal Year 2001

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

Obligations

Funding History
Fiscal Year 2001—$8,235,472
Total Funding to Date—$8,235,472

Current Active Organizations and Grant Numbers

1. Vanderbilt University
   Nashville Tennessee —HL-65692
2. University of California
   Lawrence Berkeley Laboratory
   Berkeley, California —HL-69757
3. University of California, San Diego
   San Diego, California —HL-69758

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

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

Obligations

Funding History:
Fiscal Year 2001—$2,925,232
Fiscal Years 1998-2000—$9,254,211
Funding to Date—$12,179,443

Current Active Organizations and Grant Numbers

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

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

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

Obligations

Funding History:
Fiscal Year 2001—$12,044,717
Fiscal Year 2000—$11,354,176
Total Funding to Date—$23,398,893

Current Active Organizations and Grant Numbers

1. University of Washington
   Seattle, Washington —HL-66947
2. Stanford University
   Stanford, California —HL-66948
3. University of Pittsburgh
   Pittsburgh, Pennsylvania —HL-66949
4. Weill Medical College
   of Cornell University
   New York, New York —HL-66952
5. Weill Medical College
   of Cornell University
   New York, New York —HL-67738

Programs of Genomic Applications for Heart, Lung, and Blood Diseases, Initiated in Fiscal Year 2000

The goal of this program is to develop information, tools, and resources to link genes to biological function. Specifically, researchers will identify the human genes relevant to heart, lung, blood, and sleep functions. In addition, the PGAs will establish training programs for NHLBI-supported investigators in the use of genomic information and technologies.

Obligations

Funding History:
Fiscal Year 2001—$36,665,818
Fiscal Year 2000—$37,010,352
Total Funding to Date—$73,676,170

Current Active Organizations and Grant Numbers

1. Medical College of Wisconsin
   Milwaukee, Wisconsin —HL-66579
2. Institute for Genomic Research
   Rockville, Maryland —HL-66580
3. Harvard University School of Medicine
   Boston, Massachusetts —HL-66582
4. The Johns Hopkins University
   Baltimore, Maryland —HL-66583
5. University of Pennsylvania
   Philadelphia, Pennsylvania —HL-66588
6. University of California, Berkeley
   Berkeley, California —HL-66590
7. University of California, San Francisco
   San Francisco, California —HL-66600
8. Duke University
   Durham, North Carolina —HL-66604
9. Jackson Laboratory
   Bar Harbor, Maine —HL-66611
10. The George Washington University
    Washington, DC —HL-66613
11. Children's Research Institute
    Washington, DC —HL-66614
12. The Johns Hopkins University
    Baltimore, Maryland —HL-66615
13. Boston University
    Boston, Massachusetts —HL-66617
14. The Johns Hopkins University
    Baltimore, Maryland —HL-66618
15. Institute for Genomic Research
    Rockville, Maryland —HL-66619
16. Jackson Laboratory
    Bar Harbor, Maine —HL-66620

17. J. David Gladstone Institutes
San Francisco, California —HL-66621
18. The Johns Hopkins University
Baltimore, Maryland —HL-66623
19. Fred Hutchinson Cancer Research Center
Seattle, Washington —HL-66642
20. Massachusetts General Hospital
Boston, Massachusetts —HL-66678
21. University of California
Lawrence Berkeley Laboratory
Berkeley, California —HL-66681
22. University of Washington
Seattle, Washington —HL-66682
23. University of California
Lawrence Berkeley Laboratory
Berkeley, California —HL-66691
24. University of California
Lawrence Berkeley Laboratory
Berkeley, California —HL-66713
25. University of California
Lawrence Berkeley Laboratory
Berkeley, California —HL-66727
26. University of California
Lawrence Berkeley Laboratory
Berkeley, California —HL-66728
27. University of California
Lawrence Berkeley Laboratory
Berkeley, California —HL-66729
28. Stanford University
Stanford, California —HL-66735
29. Brigham and Women's Hospital
Boston, Massachusetts —HL-66795
30. Brigham and Women's Hospital
Boston, Massachusetts —HL-66796
31. University of Arizona
Tucson, Arizona —HL-66800
32. University of Arizona
Tucson, Arizona —HL-66801
33. University of Arizona
Tucson, Arizona —HL-66803
34. Brigham and Women's Hospital
Boston, Massachusetts —HL-66804
35. Brigham and Women's Hospital
Boston, Massachusetts —HL-66805
36. University of Arizona
Tucson, Arizona —HL-66806
37. University of Texas Southwest Medical Center at Dallas
Dallas, Texas —HL-66880

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

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

Obligations

Funding History:
Fiscal Year 2001—$749,502
Fiscal Years 1997-2000—$5,214,402
Total Funding to Date—$5,963,904

Current Active Organization and Grant Number

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

Strong Heart Study, Initiated in Fiscal Year 1988

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

Obligations

Funding History:
Fiscal Year 2001—$5,378,356
Fiscal Years 1988-2000—$27,688,032
Funding to Date—$33,066,388

Current Active Organizations and Grant Numbers

1. Medstar Research Institute
Washington, DC —HL-41642
2. Missouri Breaks Research, Inc.
Timberlake, South Dakota —HL-41652
3. University of Oklahoma Health Sciences Center
Oklahoma City, Oklahoma —HL-41654

4. Southwest Foundation for Biomedical Research
San Antonio, Texas —HL-65520
5. Weill Medical College of Cornell University
New York, New York —HL-65521

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

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

Obligations

Funding History:
Fiscal Year 2001—$1,798,508
Fiscal Years 1997-2000—$6,644,649
Total Funding to Date—$8,443,157

Current Active Organizations and Grant Numbers

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

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

See Chapter 11. Clinical Trials.

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

The object of this trial is to determine the effects of HRT on progression/regression of coronary heart disease, as measured by quantitative angiography, in postmenopausal women; 70 percent of the participants are from minority populations.

Obligations

Funding History:
Fiscal Year 2001—$32,300
Fiscal Years 1995-2000—$4,903,515
Total Funding to Date—$4,935,815

Current Active Organization and Grant Number

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

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

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

Obligations

Funding History:
Fiscal Year 2001—$1,502,322
Total Funding to Date—$1,502,322

Current Active Organizations and Grant Numbers

1. University of Pittsburgh
Pittsburgh, Pennsylvania —HL-64829
2. University of Pittsburgh
Pittsburgh, Pennsylvania —HL-64914
3. University of Florida
Gainesville, Florida —HL-64924

Lung Diseases

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

The objective of this study is to establish a network of interactive asthma clinical research groups to rapidly assess novel treatment methods and to ensure that findings on optimal management of asthmatic patients are rapidly disseminated to practitioners and health care professionals. The minority patient population will be approximately 33 percent for each protocol.

Obligations

Funding History:
Fiscal Year 2001—$5,702,413
Fiscal Years 1993-2000—$35,774,585
Total Funding to Date—$41,476,998

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

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

See Chapter 11. Clinical Trials.

Collaborative Program in Bronchopulmonary Dysplasia, Initiated in Fiscal Year 1999

The objectives of this program are to support a multi-institutional collaborative research effort—by providing a well defined model of prematurity and bronchopulmonary dysplasia to investigators—and to study mechanisms of lung pathobiology that underlie development of chronic lung disease of prematurity.

Obligations

Funding History:
Fiscal Year 2001—$4,178,240
Fiscal Year 1999-2000—$8,233,645
Funding to Date—$12,411,885

Current Active Organizations and Grant Numbers

1. Southwest Foundation for Biomedical Research
   San Antonio, Texas —HL-52636
2. Brigham and Women's Hospital
   Boston, Massachusetts —HL-52638
3. University of Texas, Southwestern Medical Center
   Dallas, Texas —HL-52647
4. University of California, San Francisco
   San Francisco, California —HL-56061
5. National Jewish Medical and Research Center
   Denver, Colorado —HL-56263
6. Barnes Jewish Hospital
   St. Louis, Missouri —HL-63387
7. National Jewish Medical and Research Center
   Denver, Colorado —HL-63397
8. University of Texas, Southwestern Medical Center
   Dallas, Texas —HL-63399
9. University of Rochester
   Rochester, New York —HL-63400
10. Children's Hospital, Boston
    Boston, Massachusetts —HL-63403

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

The CSGA is a study to identify genes associated with asthma and to elucidate their functional role in development of the disease. The initial genome screen has been completed on 237 sibling pairs from three racial/ethnic groups (blacks, whites, and Hispanics).

Obligations

Funding History:
Fiscal Year 2001—$3,550,947
Fiscal Years 1992-2000—$29,295,284
Total Funding to Date—$32,846,231

Current Active Organizations and Grant Numbers

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

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

The objective of this clinical trial is to determine whether low-dose inhaled nitric oxide (NO), administered within the first 48 hours of life to premature newborns (weighing between 500 and 1250 grams) with respiratory failure requiring mechanical ventilation, will prevent development of chronic lung disease.

Obligations

Funding History:
Fiscal Year 2001—$1,803,405
Fiscal Year 2000—$1,958,793
Total Funding to Date—$3,762,198

Current Active Organization and Grant Number

1. The Children's Hospital
   University of Colorado
   Denver, Colorado —HL-64857

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

The objective of this clinical trial is to determine whether low-dose inhaled NO, administered to preterm infants (weighing between 500 and 1250 grams) who continue to require mechanical ventilation at 14 days of age, will reduce the incidence of chronic lung disease.

Obligations

Funding History:
Fiscal Year 2001—$1,741,773
Fiscal Year 2000—$1,547,602
Total Funding to Date—$3,289,375

Current Active Organization and Grant Number

1. Children's Hospital of Philadelphia
Philadelphia, Pennsylvania —HL-62514

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

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

Obligations

Funding History:
Fiscal Year 2001—$667,910
Fiscal Year 2000—$672,689
Total Funding to Date—$1,340,699

Current Active Organization and Grant Number

1. Duke University
Durham, North Carolina —HL-67467

Lung Health Study—Long-Term Follow-up, Initiated in Fiscal Year 1998

The purpose of this study is to perform a long-term follow-up to former Lung Health Study participants to assess the incidence of morbidity and mortality from respiratory and CVD, and other causes.

Obligations

Funding History:
Fiscal Year 2001—$1,672,052
Fiscal Years 1998-2000—$5,599,356
Total Funding to Date—$7,271,408

Current Active Organizations and Grant Numbers

1. The Johns Hopkins University
Baltimore, Maryland —HL-59274
2. University of Minnesota, Twin Cities
Minneapolis, Minnesota —HL-59275
3. University of Pittsburgh
Pittsburgh, Pennsylvania —HL-59276
4. Case Western Reserve University
Cleveland, Ohio —HL-59277
5. University of Utah
Salt Lake City, Utah —HL-59290
6. University of Alabama at Birmingham
Birmingham, Alabama —HL-59291
7. University of Manitoba
Winnipeg, Canada —HL-59292
8. University of California
Los Angeles, California —HL-59293
9. Mayo Foundation
Rochester, Minnesota —HL-59294
10. Oregon Health Sciences University
Portland, Oregon —HL-59320
11. Case Western Reserve University
Detroit, Michigan —HL-59739

Lymphangioleiomyomatosis (LAM) Registry, Initiated in Fiscal Year 1997

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

Obligations

Funding History:
Fiscal Year 2001—$448,206
Fiscal Years 1997-2000—$1,651,869
Funding to Date—$2,100,075

Current Active Organization and Grant Number

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

Pharmacogenetics of Asthma Treatment, Initiated in Fiscal Year 2000

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

Obligations

Funding History:
Fiscal Year 2001—$2,715,995
Fiscal Year 2000—$2,617,873
Total Funding to Date—$5,333,868

Current Active Organization and Grant Number

1. Brigham and Women's Hospital
Boston, Massachusetts —HL-65899

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

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

Obligations

Funding History:
Fiscal Year 2001—$3,666,641
Fiscal Year 2000—$2,190,193
Total Funding to Date—$5,856,834

Current Active Organizations and Grant Numbers

1. Emory University
Atlanta, Georgia —HL-63899
2. University of Michigan at Ann Arbor
Ann Arbor, Michigan —HL-63928
3. Washington University
St. Louis, Missouri —HL-63931
4. Duke University
Durham, North Carolina —HL-63932
5. University of Calgary
Calgary, Alberta —HL-63940
6. Henry Ford Health Sciences Center
Detroit, Michigan —HL-63941
7. The George Washington University
Washington, DC —HL-63942
8. Weill Medical College of Cornell University
New York, New York —HL-63981
9. Massachusetts General Hospital
Boston, Massachusetts —HL-63982
10. St. Joseph Mercy-Oakland
Pontiac, Michigan —HL-67453

Sarcoidosis Genetic Linkage Consortium, Initiated in Fiscal Year 1999

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

Obligations

Funding History:
Fiscal Year 2001—$1,922,524
Fiscal Year 1999-2000—$3,571,156
Funding to Date—$5,493,680

Current Active Organization and Grant Number

1. Case Western Reserve University, Henry Ford Health Sciences Center
Detroit, Michigan —HL-60263

Scleroderma Lung Study, Initiated in Fiscal Year 1999

To evaluate the efficacy and safety of cyclophosphamide versus placebo for the prevention and progression of symptomatic pulmonary disease in patients with systemic sclerosis.

Obligations

Funding History:
Fiscal Year 2001—$1,760,943
Fiscal Year 1999-2000—$2,540,209
Funding to Date—$4,301,152

Current Active Organizations and Grant Numbers

1. University of Medicine and Dentistry of New Jersey
Piscataway, New Jersey —HL-60550
2. University of California, Los Angeles
Los Angeles, California —HL-60587
3. The Johns Hopkins University
Baltimore, Maryland —HL-60597
4. University of California, Los Angeles
Los Angeles, California —HL-60606
5. University of Pittsburgh
Pittsburgh, Pennsylvania —HL-60607

6. Boston University
   Boston, Massachusetts —HL-60682
7. University of Alabama at Birmingham
   Birmingham, Alabama —HL-60748
8. Medical University of South Carolina
   Charleston, South Carolina —HL-60750
9. National Jewish Medical and Research Center
   Denver, Colorado —HL-60792
10. Georgetown University
    Washington, DC —HL-60794
11. Virginia Mason Research Center
    Seattle, Washington —HL-60823
12. Wayne State University
    Detroit, Michigan —HL-60839
13. University of Illinois
    Chicago, Illinois —HL-60895

Blood Diseases and Resources

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

See Chapter 11. Clinical Trials.

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

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

Obligations

Funding History:
Fiscal Year 2001—$489,103
Total Funding to Date—$489,103

Current Active Organization and Grant Number

1. Children's Hospital Oakland
   Oakland, California —HL-68091

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

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

Obligations

Funding History
Fiscal Year 2001—$433,180
Total Funding to Date—$433,180

Current Active Organization and Grant Number

1. Children's Hospital of Philadelphia
   Philadelphia, Pennsylvania —HL-58930

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

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

Obligations

Funding History:
Fiscal Year 2001—$1,221,933
Total Funding to Date—$1,221,933

Current Active Organization and Grant Number

1. Children's Hospital Oakland
   Oakland, California —HL-61877

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

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

Obligations

Funding History:
Fiscal Year 2001—$3,166,022
Fiscal Year 2000—$4,492,558
Funding to Date—$7,658,580

Current Active Organizations and Grant Numbers

1. New England Research Institutes, Inc.
   Watertown, Massachusetts —HL-52016
2. Medical College of Georgia
   Augusta, Georgia —HL-52193

Thalassemia (Cooley's Anemia) Clinical Research Network

See Chapter 11. Clinical Trials.

National Center on Sleep Disorders Research

Determinants of Compensatory Sleep Phenotype in Mice, Initiated in Fiscal Year 2000

The goal of this study is to increase understanding of dopaminergic stimulant interactions with sleep hemostasis, compensatory sleep response mechanisms, and genetic determinants of phenotypic variation in sleep homeostasis.

Obligations

Funding History:
Fiscal Year 2001—$277,705
Fiscal Year 2000—$232,874
Total Funding to Date—$510,579

Current Active Organization and Grant Number

1. Stanford University
   Stanford, California —HL-64243

Sleep Heart Health Study, Initiated in Fiscal Year 1999

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

Obligations

Funding History:
Fiscal Year 2001—$4,692,955
Fiscal Year 1999-2000—$6,596,334
Total Funding to Date—$11,289,289

Current Active Organizations and Grant Numbers

1. University of California, Davis
   Davis, California —HL-53916
2. New York University Medical Center
   New York, New York —HL-53931
3. University of Minnesota, Twin Cities
   Minneapolis, Minnesota —HL-53934
4. The Johns Hopkins University
   Baltimore, Maryland —HL-53937
5. University of Arizona
   Tucson, Arizona —HL-53938
6. Boston University
   Boston, Massachusetts —HL-53941
7. Missouri Breaks Research, Inc.
   Timberlake, South Dakota —HL63429
8. Case Western Reserve University
   Cleveland, Ohio —HL63463
9. The Johns Hopkins University
   Baltimore, Maryland —HL64360

NHLBI Research Centers (P50, P60, P30) 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.

		Obligations (Dollars in Thousands)		
Area of Concentration	**Period of Operation**	**Prior to FY 2001**	**FY 2001**	**Total to Date**
Heart and Vascular Diseases Program				
Gene Transfer Principles for Heart, Lung, and Blood Diseases	1997-	$ 1,246	$ 5,182	$ 26,428
Ischemic Heart Disease in Blacks	1995-	15,306	2,982	18,288
Ischemic Heart Disease, Sudden Cardiac Death, Heart Failure	1995-	83,759	14,518	98,277
Molecular Genetics of Hypertension	1996-	44,596	9,240	53,836
Molecular Medicine and Atherosclerosis	1997-	27,931	7,655	35,586
Pediatric Cardiovascular Disease	1993-	29,890	7,004	36,894
Subtotal, Heart and Vascular Diseases Program		222,728	46,581	269,309
Lung Diseases Program				
Acute Lung Injury	1994-	55,579	9,775	65,354
Airway Biology and Pathogenesis of Cystic Fibrosis	1988-	40,790	5,472	46,262
Cellular and Molecular Mechanisms of Asthma	1996-	46,294	10,664	56,958
Pathobiology of Fibrotic Lung Disease	1997-	18,947	4,617	23,564
Pathobiology of Lung Development	1996-	32,476	8,502	40,978
Subtotal, Lung Diseases Program		194,086	39,030	233,116
Blood Diseases and Resources Program				
Hematopoietic Stem Cell Biology	1995-	23,525	5,456	28,981
Hemostatic and Thrombotic Disorders	1971-	141,255	6,936	148,191
Transfusion Biology and Medicine	1985-	49,538	2,926	52,464
Subtotal, Blood Diseases and Resources Program		214,318	15,318	229,636
National Center for Sleep Disorders Research				
Neurobiology of Sleep and Sleep Apnea	1998-	13,054	4,825	17,879
Subtotal, National Center for Sleep Disorders Research		13,054	4,825	17,879
Total, Specialized Centers of Research (P50)		**$644,186**	**$105,754**	**$749,940**

Heart and Vascular Diseases Program

Gene Transfer Principles for Heart, Lung, and Blood Diseases

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

Obligations

Fiscal Year 2001—$5,182,162

Current Active Organizations and Grant Numbers

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

Ischemic Heart Disease in Blacks

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

Obligations

Fiscal Year 2001—$2,981,474

Current Active Organizations and Grant Numbers

1. Boston University
   Boston, Massachusetts —HL-55993
2. Medical College of Wisconsin
   Milwaukee, Wisconsin —HL-65203

Ischemic Heart Disease, Sudden Cardiac Death, Heart Failure

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

Obligations

Fiscal Year 2001—$14,517,960

Current Active Organizations and Grant Numbers

1. The Johns Hopkins University
   Baltimore, Maryland —HL-52307
2. University of Cincinnati
   Cincinnati, Ohio —HL-52318
3. University of California
   Los Angeles, California —HL-52319
4. Brigham and Women's Hospital
   Boston, Massachusetts —HL-52320
5. University of Utah
   Salt Lake City, Utah —HL-52338
6. University of California
   San Diego, California —HL-53773
7. Baylor College of Medicine
   Houston, Texas —HL-54313
8. New England Medical Center
   Boston, Massachusetts —HL-63494
9. Harvard University
   Boston, Massachusetts —HL-63609

Molecular Genetics of Hypertension

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

Obligations

Fiscal Year 2001—$9,239,850

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 Iowa Hospitals
   Iowa City, Iowa —HL-55006
5. Yale University School of Medicine
   New Haven, Connecticut —HL-55007

Molecular Medicine and Atherosclerosis

The goal of this SCOR is to advance understanding of the etiology and pathobiology of the atherosclerotic lesion at the molecular level through modern methods

and approaches of molecular medicine. Some of the subprojects have a large minority patient population.

Obligations

Fiscal Year 2001—$7,655,334

Current Active Organizations and Grant Numbers

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

Pediatric Cardiovascular Diseases

The purpose of this SCOR is to apply innovative approaches to elucidate the etiology and pathophysiology of pediatric CVD. Research findings will be translated into improved diagnosis, treatment, and prevention of CVD in children.

Obligations

Fiscal Year 2001—$7,004,372

Current Active Organizations and Grant Numbers

1. Washington University
   St. Louis, Missouri —HL-61006
2. University of Texas, Southwestern Medical Center
   Dallas, Texas —HL-61033
3. Harvard University
   Boston, Massachusetts —HL-61036
4. Children's Hospital of Philadelphia
   Philadelphia, Pennsylvania —HL-62177
5. University of Iowa
   Iowa City, Iowa —HL-62178

Lung Diseases Program

Acute Lung Injury

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

Obligations

Fiscal Year 2001—$9,776,753

Current Active Organizations and Grant Numbers

1. University of California, San Diego
   La Jolla, California —HL-23584
2. University of Washington
   Seattle, Washington —HL-30542
3. University of Minnesota, Twin Cities
   Minneapolis, Minnesota —HL-50152
4. University of Utah
   Salt Lake City, Utah —HL-50153
5. University of Michigan
   Ann Arbor, Michigan —HL-60289
6. University of Pennsylvania
   Philadelphia, Pennsylvania —HL-60290
7. University of Iowa
   Iowa City, Iowa —HL-60316

Airway Biology and Pathogenesis of Cystic Fibrosis

The goals of this SCOR are to investigate the basic mechanisms underlying cystic fibrosis, develop new hypotheses, and apply innovative strategies for approaching clinical and fundamental issues.

Obligations

Fiscal Year 2001—$5,472,350

Current Active Organizations and Grant Numbers

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

Cellular and Molecular Mechanisms of Asthma

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

Obligations

Fiscal Year 2001—$10,664,313

Current Active Organizations and Grant Numbers

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

Pathobiology of Fibrotic Lung Disease

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

Obligations

Fiscal Year 2001—$4,616,998

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 2001—$8,502,064

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, Boston
   Boston, Massachusetts —HL-56398
4. Children's Hospital of Philadelphia
   Philadelphia, Pennsylvania —HL-56401
5. University of Colorado Health Science Center
   Denver, Colorado —HL-57144

Blood Diseases and Resources Program

Hematopoietic Stem Cell Biology

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

Obligations

Fiscal Year 2001—$5,455,840

Current Active Organizations and Grant Numbers

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

Hemostatic and Thrombotic Disorders

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

Obligations

Fiscal Year 2001—$6,936,292

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
4. Baylor College of Medicine
   Houston, Texas —HL-65967

Transfusion Biology and Medicine

This SCOR has been established to foster new approaches for improving the availability, efficacy, safety, and quality of blood and blood products for therapeutic uses. One of the centers has a large minority population.

Obligations

Fiscal Year 2001—$2,925,498

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

National Center for Sleep Disorders Research

Neurobiology of Sleep and Sleep Apnea

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

Obligations

Fiscal Year 2001—$4,824,640

Current Active Organizations and Grant Numbers

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

Comprehensive Sickle Cell Centers (P60) Program

The Comprehensive Sickle Cell Centers (CSCC) were instituted in FY 1972 to bridge the gap between research and service by combining basic and clinical research, clinical trials and applications training, and community service projects into one program. The patients recruited for the clinical studies are primarily from minority populations.

Obligations

Fiscal Year 2001—$18,144,334

Current Active Organizations and Grant Numbers

1. Boston Medical Center
   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. Children's Hospital of Philadelphia
   Philadelphia, Pennsylvania —HL-38632
5. University of South Alabama
   Mobile, Alabama —HL-38639
6. Montefiore Medical Center
   New York, New York —HL-38655
7. University of Southern California
   Los Angeles, California —HL-48484
8. University of Alabama at Birmingham
   Birmingham, Alabama —HL-58418
9. Children's Hospital Medical Center
   Cincinnati, Ohio —HL-58421
10. Thomas Jefferson University
    Philadelphia, Pennsylvania —HL-62148

Centers for AIDS Research (P30) Program

The NHLBI, along with five other NIH Institutes, contributes to the support of six Centers for AIDS Research (CFAR) that were established to provide a multidisciplinary environment that promotes basic, clinical, behavioral, and translational research activities in the prevention, detection, and treatment of HIV infection and AIDS. Almost half of the patient population comes from minority groups.

Obligations

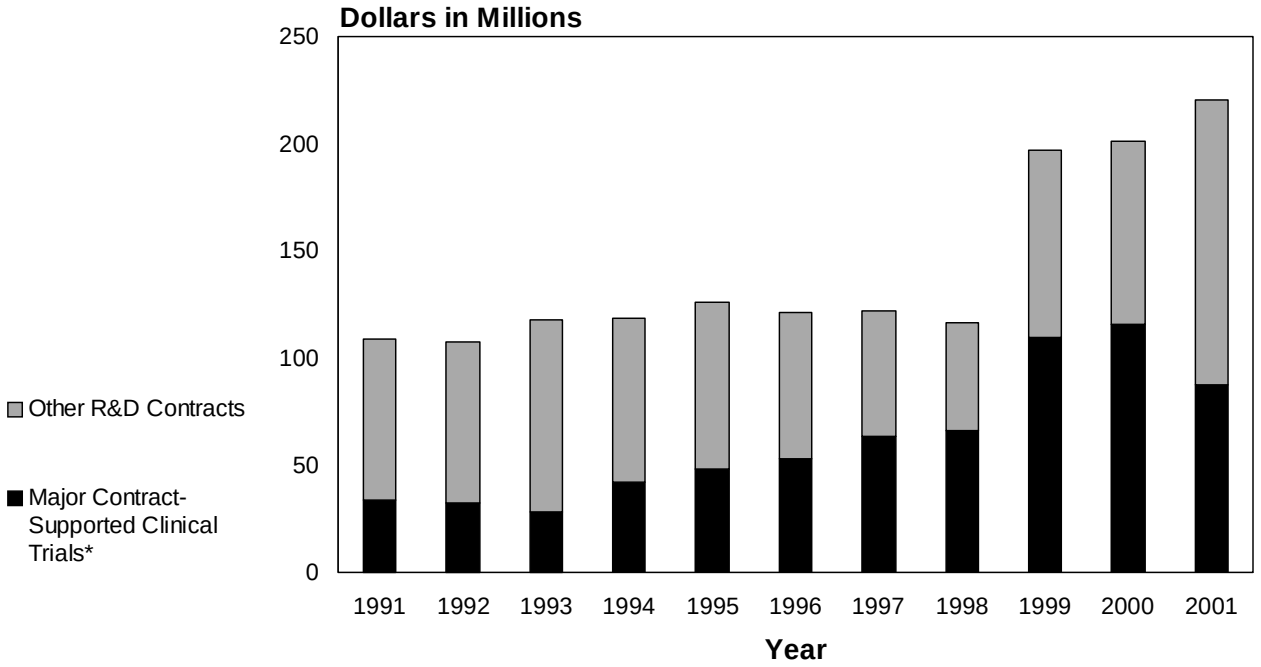
Fiscal Year 2001—$2,426,811

Current Active Organizations and Grant Numbers

1. University of Washington
   Seattle, Washington —AI-27757
2. University of Alabama at Birmingham
   Birmingham, Alabama —AI-27767
3. University of California, Los Angeles
   Los Angeles, California —AI-28697
4. University of California, San Diego
   San Diego, California —AI-36214
5. Case Western Reserve University
   Cleveland, Ohio —AI-36219
6. Miriam Hospital
   Providence, Rhode Island —AI-42853
7. Northwestern University
   Chicago, Illinois —CA-79458
8. Emory University
   Atlanta, Georgia —DA-12121
9. University of California
   San Francisco, California —MH-59037
10. New York University School of Medicine
    New York, New York —AI-27742
11. Massachusetts General Hospital
    Boston, Massachusetts —AI-42851
12. The Johns Hopkins University
    Baltimore, Maryland —AI-42855
13. University of California, Davis
    Davis, California —AI-49366
14. University of North Carolina
    Chapel Hill, North Carolina —AI-50410

10. Research and Development Contracts

NHLBI Research and Development Contract Obligations*: Fiscal Years 1991-2001



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

NHLBI Total Research and Development Contract Obligations: Fiscal Years 1991-2001

Dollars (Thousands)

	Fiscal Year										
	1991	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Heart	$61,070	$57,714	$66,717	$67,173	$70,178	$80,373	$84,820	$77,886	$93,270	$98,715	$125,291
Lung	16,910	16,977	18,552	21,957	15,414	21,032	18,183	13,123	25,432	23,341	10,993
Blood	30,725	32,980	32,280	29,122	40,324	19,522	18,934	25,695	15,436	21,538	24,572
Women's Health Initiative	—	—	—	—	—	—	—	—	63,100	57,700	59,200
Total	**$108,705**	**$107,671**	**$117,549**	**$118,252**	**$125,916**	**$120,927***	**$121,937†**	**$116,704‡**	**$197,238****	**$201,294§**	**$220,056§§**

* Includes Program Evaluation Assessment of $4,250,000.
† Includes Program Evaluation and IMPAC II Assessments of $8,986,000.
‡ Includes Program Evaluation and IMPAC II Assessments of $12,589,000.
** Includes Program Evaluation and IMPAC II Assessments of $14,904,000.
§ Includes Program Evaluation and IMPAC II Assessments of $17,944,000.
§§ Includes Program Evaluation and IMPAC II Assessments of $24,579,000.

Major NHLBI Research and Development Contracts by Program*: Fiscal Years 1991-2001

	Total Obligations Prior to FY 2001	Total FY 2001 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Atherosclerosis Risk in Communities (ARIC)	$107,387,058	$3,588,577	$110,975,635
Cardiovascular Health Study (CHS)	64,960,419	4,264,000	69,224,419
Circulatory Assist/Artificial Heart Program	91,121,214	2,644,984	93,766,198
Coronary Artery Risk Development in Young Adults (CARDIA)	51,186,511	4,850,619	56,037,130
Framingham Study	35,769,449	1,596,067	37,365,516
Innovative Ventricular Assist System (IVAS)	26,766,016	421,000	27,187,016
Jackson Heart Study (JHS)	5,519,000	3,997,000	9,516,000
Mammalian Genotyping Service (MGS)	14,769,750	1,500,000	16,269,750
Multi-Ethnic Study of Atherosclerosis (MESA)	15,225,000	14,478,000	29,703,000
Lung Diseases			
A Case-Controlled Etiologic Study of Sarcoidosis (ACCESS)	11,372,464	—	11,372,464
Pediatric Pulmonary and Cardiac Complications of HIV Infection (P2C2)	47,369,077	—	47,369,077
Blood Diseases and Resources			
Hemochromatosis and Iron Overload Screening Study (HEIRS)	2,490,577	8,987,000	11,477,577
Maintenance of NHLBI Biological Specimen Repository	3,250,565	440,000	3,690,565
Refinement of New Assays for Direct Detection of Viral Nucleic Acids in Donated Organs	4,652,739	3,100,140	7,752,879
Retrovirus Epidemiology Donor Study (REDS)	55,332,118	6,896,956	62,229,074

* Excludes clinical trials included in Chapter 11.

Heart and Vascular Diseases Program

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

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

Obligations

Funding History:
Fiscal Year 2001—$3,588,577
Fiscal Years 1985-2000—$107,387,058
Total Funding to Date—$110,975,635

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

Obligations

Funding History:
Fiscal Year 2001—$4,264,000
Fiscal Years 1988-2000—$64,960,419
Total Funding to Date—$69,224,419

Current Active Organizations and Contract Numbers

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

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 2001—$2,644,984
Fiscal Years 1984-2000—$91,121,214
Total Funding to Date—$93,766,198

Current Active Organizations and Contract Numbers

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

1. Abiomed, Inc.
Danvers, Massachusetts —HV-38128
2. Pennsylvania State University
Hershey, Pennsylvania —HV-38130

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

The purpose of this study is to describe and identify factors associated with the development of cardiovascular risk factors and early atherosclerosis in a cohort of black and white young adults. Seven examinations have been completed; the last one included a measure of subclinical atherosclerosis.

Obligations

Funding History:
Fiscal Year 2001—$4,850,619
Fiscal Years 1984-2000—$51,186,511
Total Funding to Date—$56,037,130

Current Active Organizations and Contract Numbers

1. Harbor-UCLA Research and
Education Institute
Torrance, California —HC-05187
2. University of California at Irvine
Irvine, California —HC-45134
3. University of Alabama at Birmingham
Birmingham, Alabama —HC-48047

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

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

Framingham Study

The 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, and a third-generation cohort of their children has been added. The subsequent cohorts permit the examination of numerous hypotheses about the familial clustering of CVD and CVD risk factors.

Obligations

Funding History:
Fiscal Year 2001—$1,596,067
Fiscal Years 1983-2000—$35,769,449
Total Funding to Date—$37,365,516

Current Active Organization and Contract Number

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

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

The purpose 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 2001—$421,000
Fiscal Years 1995-2000—$26,766,016
Total Funding to Date—$27,187,016

Current Active Organizations and Contract Numbers

1. Abiomed, Inc.
   Danvers, Massachusetts —HV-58154
2. Whalen Biomedical, Inc.
   Cambridge, Massachusetts —HV-58158
3. Cleveland Clinic Foundation
   Cleveland, Ohio —HV-58159

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

The JHS is a single-site epidemiologic study of CVD in blacks, similar to established studies in Framingham, Massachusetts, and Honolulu, Hawaii, with primary goals of identifying risk factors for development and progression of CVD; enhancing recruitment, cohort retention, and scientific productivity of the existing Jackson site of the ARIC study; building research capabilities at minority institutions; developing partnerships between minority and majority institutions; and expanding minority investigator participation in large-scale epidemiologic studies.

Obligations

Funding History:
Fiscal Year 2001—$3,997,000*
Fiscal Year 1998-2000—$5,519,000*
Total Funding to Date—$9,516,000

Current Active Organizations and Contract Numbers

1. Jackson State University
   Jackson, Mississippi —HC-95170
2. Mississippi Medical Center
   Jackson, Mississippi —HC-95171
3. Tougaloo College
   Tougaloo, Mississippi —HC-95172

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

The NHLBI MGS provides genotyping to meritorious projects involving humans, mice, and rats in all disease areas. This service provides genome-wide screens, using short tandem repeat polymorphisms, to assist in finding genes associated with health and disease. Currently, the capacity of the MGS is 4 million genotypes per year.

Obligations

Funding History:
Fiscal Year 2001—$1,500,000
Fiscal Years 1994-2000—$14,769,750
Total Funding to Date—$16,269,750

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

Current Active Organization and Contract Number

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

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

The purpose of this study is to investigate the prevalence, correlates, and progression of subclinical CVD, i.e., disease detected noninvasively before it has produced clinical signs and symptoms, in a population consisting of 40 percent whites, 30 percent blacks, 20 percent Hispanics, and 10 percent Asians, predominantly of Chinese descent.

Obligations

Funding History:
Fiscal Year 2001—$14,478,000
Fiscal Year 1999-2000—$15,225,000
Total Funding to Date—$29,703,000

Current Active Organizations and Contract Numbers

1. University of Washington
   Seattle, Washington —HC-95159
2. University of California
   Los Angeles, California —HC-95160
3. Columbia University
   New York, New York —HC-95161
4. The Johns Hopkins University
   Baltimore, Maryland —HC-95162
5. University of Minnesota
   Minneapolis, Minnesota —HC-95163
6. Northwestern University
   Chicago, Illinois —HC-95164
7. Wake Forest University
   Winston-Salem, North Carolina —HC-95165
8. University of Vermont
   Colchester, Vermont —HC-95166
9. New England Medical Center
   Boston, Massachusetts —HC-95167
10. The Johns Hopkins University
    Baltimore, Maryland —HC-95168
11. Harbor-UCLA Research and Education Institute
    Los Angeles, California —HC-95169

Lung Diseases Program

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

The purpose of this program is to support a multicenter case-control study, in a predominately black population, of potential etiologic factors for sarcoidosis, a systemic granulomatous disease that usually produces disease in the lung. The study is assessing the role of infection, as well as environmental and familial factors in the etiology of the disease. The protocol includes comprehensive clinical characterization and examination of markers of immune responsiveness, as well as banking of blood components for further studies.

Obligations

Funding History:
Fiscal Year 2001—$0
Fiscal Years 1995-2000—$11,372,464
Total Funding to Date—$11,372,464

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, DC —HR-56073
10. Beth Israel Hospital
    Boston, Massachusetts —HR-56074
11. Clinical Trials and Surveys Corporation
    Baltimore, Maryland —HR-56075

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

This multicenter natural history study, in a primarily minority population, is designed to identify and follow the course of lung and CVD that occur in pediatric patients with all stages of vertically transmitted HIV infection.

Obligations

Funding History:
Fiscal Year 2001—$0
Fiscal Years 1989-2000—$47,369,007
Total Funding to Date—$47,369,007

Current Active Organizations and Contract Numbers

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

Blood Diseases and Resources Program

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

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

Obligations

Funding History:
Fiscal Year 2001—$8,987,000
Fiscal Year 2000—$2,490,577
Total Funding to Date—$11,477,577

Current Active Organizations and Contract Numbers

1. University of Minnesota
Minneapolis, Minnesota —HC-05185
2. Howard University
Washington, DC —HC-05186
3. University of Alabama
Birmingham, Alabama —HC-05188
4. Kaiser Foundation Research Institute
Oakland, California —HC-05189
5. University of California
Irvine, California —HC-05190
6. London Health Science Centre
Ontario, Canada —HC-05191
7. Wake Forest University
Winston-Salem, North Carolina —HC-05192

Maintenance of NHLBI Biological Specimen Repository, Initiated in Fiscal Year 1998

The purpose of this project is to establish an NHLBI Biological Specimen Repository for blood specimens from Institute-supported research. The Repository monitors storage, labeling, and testing of the specimens, as well as administers safe shipment of precise sample aliquots to approved investigators for future studies.

Obligations

Funding History:
Fiscal Year 2001—$440,000
Fiscal Year 1998-2000—$3,250,565
Total Funding to Date—$3,690,565

Current Active Organization and Contract Number

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

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-1, hepatitis B virus, and hepatitis C virus) in donors of organs for transplantation. The purpose of the new technique is to reduce the antibody-negative window between infectivity and detection to the shortest possible time.

Obligations

Funding History:
Fiscal Year 2001—$3,100,140
Fiscal Years 1996-2000—$4,652,739
Total Funding to Date—$7,752,879

Current Active Organization and Contract Number

1. Gen-Probe, Inc.
   San Diego, California —HB-07148

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

This program was established to determine the prevalence of retrovirus positivity in blood donors, a majority of whom are minority. Researchers are evaluating the demographic, risk factor, and behavioral characteristics of blood donors with high risks who continue to donate. A blood specimen repository is also being established as a mechanism for evaluating new tests for known viruses and as a sentinel for as-yet-unrecognized viruses.

Obligations

Funding History:
Fiscal Year 2001—$6,896,956
Fiscal Years 1989-2000—$55,332,118
Total Funding to Date—$62,229,074

Current Active Organizations and Contract Numbers

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

11. Clinical Trials

A clinical trial is defined as a scientific research study undertaken with human subjects to evaluate prospectively the diagnostic, prophylactic, or therapeutic effect of a drug, device, regimen, or procedure used or intended ultimately for use in the practice of medicine or the prevention of disease. A clinical trial is planned and conducted prospectively and includes a concurrent control group or other appropriate comparison group.

NHLBI Investigator-Initiated Clinical Trials: Fiscal Years 1991-2001

Research Grants and Cooperative Agreements (Dollars in Thousands)

	Fiscal Year										
	1991	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Heart and Vascular Diseases											
Program on Surgical Control of Hyperlipidemias (POSCH)	$1,584	$ —	$ 485	$ 500	$ 538	$ 566	$ 294	$ —	$ —	$ —	$ —
Physicians' Health Study	555	—	—	—	—	—	—	—	—	—	—
Stanford Coronary Risk Intervention Program (SCRIP)	354	382	—	—	—	—	—	—	—	—	—
Continuation of Trial of Antihypertensive Intervention Management (COTAIM)	614	—	—	—	—	—	—	—	—	—	—
Polyunsaturates and KCl to Control Mild Hypertension	328	—	—	—	—	—	—	—	—	—	—
Boston Area Anticoagulation Trial for Atrial Fibrillation	370	—	—	—	—	—	—	—	—	—	—
Electrophysiologic Study vs. Electrocardiographic Monitoring (ESVEM)	904	740	—	—	—	—	—	—	—	—	—
Sodium-Potassium Blood Pressure Trial in Children	205	—	—	—	—	—	—	—	—	—	—
Treatment of Mild Hypertension Study (TOMHS)	962	—	—	—	—	—	—	—	—	—	—
Myocarditis Treatment Trial	247	—	—	—	—	—	—	—	—	—	—
Coronary Artery Surgery Study Follow-up	644	670	—	—	—	—	—	—	—	—	—
Training Levels Comparison Trial	245	—	—	—	—	—	—	—	—	—	—
Controlled Trial to Reverse Coronary Atherosclerosis	180	—	—	—	—	—	—	—	—	—	—
Cardiac Arrest in Seattle: Conventional vs. Amiodarone Drug Evaluation (CASCADE)	668	—	—	—	—	—	—	—	—	—	—
Emory Angioplasty Versus Surgery Trial (EAST)	1,951	—	277	288	296	296	—	—	—	—	—
Asymptomatic Carotid Artery Plaque Study (ACAPS)	901	1,255	—	—	66	70	—	—	—	—	—
Myocardial Infarction Triage and Intervention Project (MITI)	539	—	—	—	—	—	—	—	—	—	—
Infant Heart Surgery: Central Nervous System Sequelae of Circulatory Arrest	720	770	756	516	598	699	685	582	584	392	75
Lifestyle Heart Trial	604	524	—	—	—	—	—	—	—	—	—
Thrombolysis in Myocardial Ischemia (T3)	4,011	636	—	—	—	—	—	—	—	—	—
Do Fish Oils Prevent Restenosis Post-Coronary Angioplasty?*	1,452	750	—	—	—	—	—	—	—	—	—
Prevention of Early Readmission in Elderly Congestive Heart Failure Patients	106	108	112	77	—	—	—	—	—	—	—
MRFIT Follow-up and Analysis	358	387	402	418	—	—	—	—	—	—	—
Multicenter Unsustained Tachycardia Trial*	2,029	2,072	2,092	2,095	1,958	504	—	—	—	—	—
Trial of Aspirin and Vitamin E in Nurses	2,990	1,170	1,393	1,488	1,426	1,434	1,473	1,536	1,530	1,594	—
Diet and Exercise for Elevated Risk (DEER)	717	775	805	703	—	—	—	—	—	—	—
Cardiovascular Risk Factors and the Menopause	—	539	610	601	451	478	494	528	186	—	—

* Paid by U01/U10.

NHLBI Investigator-Initiated Clinical Trials: Fiscal Years 1991-2001 (continued)

	Research Grants and Cooperative Agreements (Dollars in Thousands)										
	Fiscal Year										
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Heart and Vascular Diseases (continued)											
Sodium Sensitivity in African Americans	—	686	492	97	249	—	—	—	—	—	—
Montreal Heart Attack Readjustment Trial (M-HART)	—	271	298	340	—	—	—	—	—	—	—
Stress Reduction in Elderly Blacks With Hypertension	—	296	321	338	321	—	—	—	—	—	—
Trial of Nonpharmacologic Intervention in the Elderly (TONE)	—	749	1,038	796	729	—	—	—	—	—	—
CABG Patch Trial*	—	—	3,362	3,117	1,344	988	1,171	—	—	—	—
Women's Antioxidant and Cardiovascular Study (WACS)	—	—	586	612	620	643	501	525	540	556	572
Oral Calcium in Pregnant Women With Hypertension	—	—	280	290	306	320	332	—	—	—	—
Stress Reduction and Atherosclerotic CVD in Blacks	—	—	—	219	330	403	407	40	326	339	360
Enalapril After Anthracycline Cardiotoxicity	—	—	—	587	647	707	724	789	—	—	—
Stress and Anger Management for Blacks With Hypertension	—	—	—	221	232	241	250	—	—	—	—
Estrogen Replacement and Atherosclerosis (ERA) Trial*	—	—	—	1,123	260	1,213	965	1668	1,017	—	—
Shock Trial: Should We Emergently Revascularize Occluded Coronaries for Cardiogenic Shock?	—	—	—	1,070	1,022	1,008	826	874	—	440	362
HDL-Atherosclerosis Treatment Study	—	—	—	484	480	427	445	340	—	326	—
Influence of Cardiopulmonary Bypass (CPB) Temperature on CABG Morbidity	—	—	—	118	107	118	—	—	—	—	—
Women's Estrogen/Progestin Lipid Lowering Hormone Atherosclerosis Regression Trial (WELL-HART)*	—	—	—	—	798	508	1,196	1,269	1,131	—	32
Mode Selection Trial in Sinus Node Dysfunction (MOST)*	—	—	—	—	2,163	1,857	2,096	1,700	2,879	1,136	154
Antioxidants and Prevention of Early Atherosclerosis*	—	—	—	—	793	240	603	—	—	—	—
Postmenopausal Hormone Therapy In Unstable Angina	—	—	—	—	253	258	264	271	276	—	—
Estrogen and Graft Atherosclerosis Research Trial (EAGER)*	—	—	—	—	—	476	488	305	—	361	371
Soy Estrogen Alternative Study (SEA)	—	—	—	—	—	219	217	221	—	—	—
REMATCH Trial*	—	—	—	—	—	—	1,258	1,798	1,333	825	750
Dietary Patterns, Sodium Intake, and Blood Pressure (DASH Sodium)*†	—	—	—	—	—	—	2,233	3,693	3,646	1,247	151
Sudden Cardiac Death in Heart Failure Trial (SCD-HeFT)*	—	—	—	—	—	—	1,571	1,667	1,709	1,698	1,798
CVD Risk and Health in Post- Menopausal Phytoestrogen Users	—	—	—	—	—	—	631	662	574	244	—
Treatment of Hypertension With Two Exercise Intensities	—	—	—	—	—	—	359	474	473	481	420
Prevention of Recurrent Venous Thromboembolism (PREVENT)	—	—	—	—	—	—	—	1,242	894	521	543
PREMIER: Lifestyle Interventions for Blood Pressure Control*	—	—	—	—	—	—	—	2,234	3,425	3,595	2,925
Azithromycin Coronary Events Study (ACES)*	—	—	—	—	—	—	—	847	2,663	2,182	720
Antiarrhythmic Effects of N-3 Fatty Acids	—	—	—	—	—	—	—	—	514	542	529
Fatty Acid Antiarrhythmia Trial (FAAT)	—	—	—	—	—	—	—	—	519	605	—
Occluded Artery Trial*	—	—	—	—	—	—	—	—	1,628	5,079	2,604

* Paid by U01/U10.

† Previously an Institute-Initiated Clinical Trial.

NHLBI Investigator-Initiated Clinical Trials: Fiscal Years 1991-2001 (continued)

	Research Grants and Cooperative Agreements (Dollars in Thousands)										
	Fiscal Year										
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Heart and Vascular Diseases (continued)											
Bypass Angioplasty Revascularization Investigation in Type 2 Diabetics (BARI 2D)*	—	—	—	—	—	—	—	—	—	3,942	6,515
Hematocrit Strategy in Infant Heart Surgery*	—	—	—	—	—	—	—	—	—	473	557
Angiotensin-II Blockade in Mitral Regurgitation	—	—	—	—	—	—	—	—	—	—	553
Heart Failure Adherence and Retention Trial (HART)	—	—	—	—	—	—	—	—	—	—	795
Reduction of Triglycerides in Women on HRT	—	—	—	—	—	—	—	—	—	—	708
Women's Ischemia Syndrome Evaluation (WISE)†	—	—	—	—	—	—	—	—	—	—	1,502
Subtotal, Heart and Vascular Diseases	24,238	12,780	13,309	16,098	15,987	13,673	19,483	23,265	25,847	26,578	22,996
Lung Diseases											
Emphysema: Physiologic Effects of Nutritional Support	224	230	246	155	—	—	—	—	—	—	—
Cardiopulmonary Effects of Ibuprofen in Human Sepsis*	725	792	886	683	—	—	—	—	—	—	—
Inhaled Beclomethasone to Prevent Chronic Lung Disease*	—	—	583	690	738	551	436	—	—	—	—
Lung Health Study II*†	—	—	594	3,307	4,434	3,183	3,508	980	—	—	—
Lung Health Study III*†	—	—	—	—	—	—	—	1,997	1,986	1,616	1,672
Asthma Clinical Research Network*†	—	—	—	—	—	—	—	5,849	5,399	5,686	5,705
Fetal Tracheal Occlusion for Severe Diaphragmatic Hernia*	—	—	—	—	—	—	—	—	419	429	181
Scleroderma Lung Study*	—	—	—	—	—	—	—	—	1,040	1,501	1,761
Inhaled NO for Prevention of Chronic Lung Disease*	—	—	—	—	—	—	—	—	—	1,959	1,803
Inhaled NO in Prevention of Chronic Lung Disease*	—	—	—	—	—	—	—	—	—	1,548	1,742
Prospective Investigation of Pulmonary Embolism Diagnosis (PIOPED 2)*	—	—	—	—	—	—	—	—	—	2,190	3,667
Randomized Trial to Reduce ETS in Children With Asthma	—	—	—	—	—	—	—	—	—	555	545
Subtotal, Lung Diseases	949	1,022	2,309	4,835	5,172	3,734	3,944	8,826	8,844	15,484	17,076
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)	211	220	218	—	—	—	—	—	—	—	—
Trial to Reduce Alloimmunization to Platelets (TRAP)—Extension†	—	—	—	2,510	1,246	263	—	—	—	—	—
Stroke Prevention in Sickle Cell Anemia (STOP)*	—	—	—	2,751	3,257	2,435	2,584	2,036	—	293	—
Pediatric Hydroxyurea in Sickle Cell Anemia (PED HUG)	—	—	—	146	250	260	270	—	—	—	—
Stroke Prevention in Sickle Cell Anemia (STOP 2)*	—	—	—	—	—	—	—	—	—	4,200	3,166
Induction of Stable Chimerism for Sickle Cell Anemia	—	—	—	—	—	—	—	—	—	—	489
Sibling Donor Cord Blood Banking and Transplantation	—	—	—	—	—	—	—	—	—	—	1,222
Subtotal, Blood Diseases and Resources	2,210	3,359	3,439	8,678	5,991	2,958	2,854	2,036	—	4,493	4,877
Total, NHLBI	**$27,397**	**$17,161**	**$19,057**	**$29,611**	**$27,150**	**$20,365**	**$26,281**	**$34,127**	**$34,691**	**$46,555**	**$44,949**

* Paid by U01/U10.

† Previously an Institute-Initiated Clinical Trial.

NHLBI Investigator-Initiated Clinical Trials, Fiscal Year 2001: Summary by Program

	Total Obligations Prior to FY 2001	FY 2001 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Angiotensin-II Blockade in Mitral Regurgitation	$ —	$ 553,312	$ 553,312
Antiarrhythmic Effects of N-3 Fatty Acids	1,055,649	528,714	1,584,363
Azithromycin Coronary Events Study (ACES)*	5,692,173	720,510	6,412,683
Bypass Angioplasty Revascularization Investigation in Type 2 Diabetes (BARI 2D)*	3,942,284	6,515,193	10,457,477
CVD Risk and Health in Postmenopausal Phytoestrogen Users	2,110,940	—	2,110,940
Dietary Patterns, Sodium Intake, and Blood Pressure (DASH Sodium)*	10,818,853	150,543	10,969,396
Estrogen and Graft Atherosclerosis Research Trial (EAGER)*	1,630,727	370,606	2,001,333
Fatty Acid Antiarrhythmia Trial (FAAT)	1,124,630	—	1,124,630
Heart Failure Adherence and Retention Trial (HART)	—	794,551	794,551
Hematocrit Strategy in Infant Heart Surgery*	473,481	556,787	1,030,268
Infant Heart Surgery: Central Nervous System Sequelae of Circulatory Arrest	7,512,413	75,022	7,587,435
Mode Selection Trial in Sinus Node Dysfunction (MOST)*	11,829,311	153,951	11,983,262
Occluded Artery Trial*	6,706,414	2,603,528	9,309,942
PREMIER: Lifestyle Interventions for Blood Pressure Control*	9,254,211	2,925,232	12,179,443
Prevention of Recurrent Venous Thromboembolism (PREVENT)	2,656,784	543,259	3,200,043
Reduction of Triglycerides in Women on HRT	—	708,215	708,215
REMATCH Trial*	5,214,402	749,502	5,963,904
Shock Trial: Should We Emergently Revascularize Occluded Coronaries for Cardiogenic Shock?	5,238,393	362,402	5,600,795
Stress Reduction and Atherosclerotic CVD in Blacks	2,064,342	359,985	2,424,327
Sudden Cardiac Death in Heart Failure Trial (SCD-HeFT)*	6,644,649	1,798,508	8,443,157
Treatment of Hypertension With Two Exercise Intensities	1,786,558	419,940	2,206,498
Trial of Aspirin and Vitamin E in Women	16,033,881	—	16,033,881
Women's Antioxidant and Cardiovascular Study (WACS)	4,582,255	571,758	5,154,013
Women's Estrogen/Progestin Lipid-Lowering Hormone Atherosclerosis Regression Trial (WELL-HART)*	4,903,315	32,300	4,935,615
Women's Ischemia Syndrome Evaluation (WISE)*†	—	1,502,322	1,502,322
Subtotal, Heart and Vascular Diseases	111,275,665	22,996,140	134,271,805
Lung Diseases			
Asthma Clinical Research Network*†	16,934,589	5,705,347	22,639,936
Fetal Tracheal Occlusion for Severe Diaphragmatic Hernia*	848,076	181,555	1,029,631
Inhaled NO for the Prevention of Chronic Lung Disease*	1,958,793	1,803,405	3,762,198
Inhaled NO in Prevention of Chronic Lung Disease*	1,547,602	1,741,773	3,289,375
Lung Health Study III*†	5,599,356	1,672,052	7,271,408
Prospective Investigation of Pulmonary Embolism Diagnosis (PIOPED 2)*	2,190,193	3,666,641	5,856,834
Randomized Trial to Reduce ETS in Children With Asthma	554,905	544,744	1,099,649
Scleroderma Lung Study*	2,540,209	1,760,943	4,301,152
Subtotal, Lung Diseases	32,173,723	17,076,460	49,250,183
Blood Diseases and Resources			
Induction of Stable Chimerism for Sickle Cell Anemia	—	489,103	489,103
Sibling Donor Cord Blood Banking and Transplantation	—	1,221,933	1,221,933
Stroke Prevention in Sickle Cell Anemia (STOP 2)*	4,199,996	3,166,022	7,366,018
Subtotal, Blood Diseases and Resources	4,199,996	4,877,058	9,077,054
Total, NHLBI	**$147,649,384**	**$44,949,658**	**$192,599,042**

* Indicates paid by U01/U10.

† Previously an Institute-Initiated Clinical Trial.

Institute-Initiated Clinical Trials: Fiscal Years 1991-2001
Contracts

Dollars (Thousands)

	Fiscal Year										
	1991	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Heart and Vascular Diseases											
Lipid Research Clinics	$ 967	$ 574	$ 11	$ 622	$ 583	$ 660	$ 650	$ 685	$ —	$ —	$ —
Systolic Hypertension in the Elderly Program (SHEP)	1,295	404	369	—	—	—	—	—	—	—	—
Studies of Left Ventricular Dysfunction (SOLVD)	2,325	902	—	—	—	—	—	—	—	—	—
Cardiac Arrythmia Suppression Trial (CAST)	4,872	2,193	—	29	—	—	—	—	—	—	—
Postcoronary Artery Bypass Graft (CABG) Study*	3,628	5,195	213	—	—	—	—	—	—	—	—
Prevention and Treatment of Hypertension Study (PATHS)	787	564	585	—	—	—	—	—	—	—	—
Effects of Digitalis on Survival in Patients With Congestive Heart Failure	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 vs. Implantable Defibrillator (AVID)	—	250	1,203	1,068	5,348	2,475	—	871	548	—	—
Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT)	—	—	2,760	10,914	3,412	9,676	15,943	17,119	—	6,259	7,000
Activity Counseling Trial (ACT)	—	—	—	1,260	5,000	—	2,167	2,439	—	—	—
Postmenopausal Estrogen/Progestin Interventions (PEPI)	—	—	—	600	1,305	—	3	170	—	—	—
Enhancing Recovery in Coronary Heart Disease Patients (ENRICHD)	—	—	—	—	1,871	6,993	6,837	5,904	3,303	3,487	596
Atrial Fibrillation Follow-up: Investigation in Rhythm Management (AFFIRM)	—	—	—	—	883	2,510	6,330	—	3,785	1,239	2,401
Beta-Blocker Evaluation Survival Trial (BEST)	—	—	—	—	2,500	1,435	2,300	2,448	—	—	—
Women's Angiographic Vitamin and Estrogen Trial (WAVE)	—	—	—	—	—	731	2,891	1,917	3,878	886	756
Women's Ischemia Syndrome Evaluation (WISE)	—	—	—	—	—	1,577	133	2,932	856	1,424	10
Prevention of Events With Angiotensin Converting Enzyme Inhibitor Therapy (PEACE)	—	—	—	—	—	3,632	2,838	2,836	2,850	5,988	—
Magnesium in Coronaries (MAGIC)	—	—	—	—	—	—	—	1,169	2,009	1,243	—
Evaluation Study of Congestive Heart Failure and Pulmonary Artery (ESCAPE)	—	—	—	—	—	—	—	—	1,750	1,820	—
Action to Control Cardiovascular Risk in Diabetes (ACCORD)	—	—	—	—	—	—	—	—	4,130	6,590	—

Institute-Initiated Clinical Trials: Fiscal Years 1991-2001 (continued)

Contracts (continued)

	Dollars (Thousands)										
	Fiscal Year										
	1991	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Heart and Vascular Diseases (continued)											
Public Access Defibrillation (PAD) Community Trial	—	—	—	—	—	—	—	—	2,923	2,414	3,058
Subtotal, Heart and Vascular Diseases	19,690	18,476	13,828	20,279	25,368	29,910	40,111	38,490	26,032	31,350	13,821
Lung Diseases											
Lung Health Study I	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	—	6,551	729	1,330
Acute Respiratory Distress Syndrome Clinical Network (ARDSNET)	—	—	—	1,800	4,170	4,337	4,510	4,880	6,837	5,587	2,667
National Emphysema Treatment Trial (NETT)	—	—	—	—	—	—	2,710	3,367	7,545	4,047	6,989
Feasibility of Retinoid Treatment in Emphysema (FORTE)	—	—	—	—	—	—	—	—	884	7,711	—
Subtotal, Lung Diseases	8,305	10,496	11,361	14,943	9,916	12,664	12,915	8,247	21,817	18,074	10,986
Blood Diseases and Resources											
Clinical Course of Sickle Cell Disease	1,609	2,161	1,756	2,390	4,375	376	205	2,144	350	106	—
Penicillin Prophylaxis in Sickle Cell Disease (PROPS II)	1,013	1,058	1,095	226	—	—	—	—	—	—	—
Anti-HIV Immunoglobulin (HIVIG) in Prevention of Maternal-Fetal HIV Transmission	3,016	—	—	3,016	1,819	706	—	—	—	—	—
T-Cell Depletion in Unrelated Donor Marrow	—	—	—	1,310	1,917	1,461	639	2,228	690	1,085	1,144
Viral Activation Transfusion Study (VATS)	—	—	—	—	5,000	5,647	2,353	1,668	—	339	—
Cord Blood Stem Cell Transplantation Study	—	—	—	—	—	1,419	6,573	12,530	1,456	5,122	1,846
Multicenter Study of Hydroxyurea in Sickle Cell Anemia Adult Follow-Up (MSH)	—	—	—	—	—	703	472	475	—	—	—
Pediatric Hydroxyurea Phase III Clinical Trial (BABY HUG)	—	—	—	—	—	—	—	—	—	1,606	405
Subtotal, Blood Diseases and Resources	5,638	3,219	2,851	6,942	13,111	10,312	10,242	19,045	2,496	8,258	3,395
Women's Health Initiative	—	—	—	—	—	—	—	—	59,100	57,700	59,200
Total, NHLBI Clinical Trials Contracts	**$33,633**	**$32,191**	**$28,040**	**$42,164**	**$48,395**	**$52,886**	**$63,268**	**$65,782**	**$109,445**	**$115,382**	**$87,402**

* Gift Fund (unappropriated) used—$4,662,000–FY 94;$1,320,000–FY 95; and $917,720–FY 96.

Institute-Initiated Clinical Trials: Fiscal Years 1991-2001 (continued)

Cooperative Agreements

Dollars (Thousands)

	Fiscal Year										
	1991	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Heart and Vascular Diseases											
Trials of Hypertension Prevention (TOHP)	$6,846	$5,435	$5,111	$4,385	$1,240	$ 649	$ —	$ —	$ —	$ —	$ —
Dietary Intervention Study in Children (DISC)	2,154	2,018	1,686	1,615	1,625	1,625	746	—	—	—	—
Bypass Angioplasty Revascularization Investigation (BARI)	6,309	3,952	3,978	3,965	3,882	2,757	2,894	1,360	1,609	1,634	1,549
Postmenopausal Estrogen/ Progestin Interventions (PEPI)	2,801	2,554	1,516	1,109	584	331	—	—	—	—	—
Child and Adolescent Trial for Cardiovascular Health (CATCH)	5,920	5,501	6,077	2,586	2,342	2,682	3,956	572	210	—	—
Cholesterol Reduction in Seniors Program (CRISP)	1,496	850	—	—	—	—	—	—	—	—	—
Dietary Effects on Lipoproteins and Thrombogenic Activity (DELTA)	—	1,950	3,213	3,121	2,485	132	290	—	—	—	—
Obesity Prevention in American Indians (PATHWAYS)	—	—	1,689	1,814	2,150	3,432	4,119	3,945	4,196	2,459	—
Dietary Approaches to Stop Hypertension (DASH)	—	—	1,650	2,350	2,513	899	—	—	—	—	—
Rapid Early Action for Coronary Treatment (REACT)	—	—	—	2,609	5,091	4,992	2,866	496	—	—	—
Girls Health Enrichment Multisite Studies (GEMS)	—	—	—	—	—	—	—	—	2,282	2,365	2,877
Trial of Activity in Adolescent Girls (TAAG)	—	—	—	—	—	—	—	—	—	5,274	4,831
Pediatric Cardiovascular Clinical Research Network	—	—	—	—	—	—	—	—	—	—	3,447
Subtotal, Heart and Vascular Diseases	25,526	22,260	24,920	23,554	21,912	17,499	14,871	6,373	8,297	11,732	12,704
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	—	—	—	—
Childhood Asthma Research and Education (CARE)	—	—	—	—	—	—	—	—	4,175	5,002	5,314
Subtotal, Lung Diseases	—	—	2,500	4,694	4,631	5,526	5,392	—	4,175	5,002	5,314
Blood Diseases and Resources											
Trial to Reduce Alloimmunization to Platelets (TRAP)	2,111	3,483	1,422	—	—	—	—	—	—	—	—
Thalassemia (Cooley's Anemia) Clinical Research Network	—	—	—	—	—	—	—	—	—	2,192	2,219
Blood and Marrow Transplant Clinical Research Network	—	—	—	—	—	—	—	—	—	—	5,360
Subtotal, Blood Diseases and Resources	2,111	3,483	1,422	—	—	—	—	—	—	2,192	7,579
Total, NHLBI-Initiated Clinical Trials, Cooperative Agreements	$27,637	$25,743	$28,842	$28,248	$26,543	$23,025	$20,263	$6,373	$12,472	$18,926	$25,597
Total, NHLBI-Initiated Clinical Trials	**$61,270**	**$57,934**	**$56,882**	**$70,412**	**$74,938**	**$75,911**	**$83,531**	**$72,155**	**$121,917**	**$134,308**	**$112,999**

Institute-Initiated Clinical Trials, Fiscal Year 2001: Summary by Program

Contracts

	Total Obligations Prior to FY 2001	Total FY 2001 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Action to Control Cardiovascular Risk in Diabetes (ACCORD)	$ 10,720,324	$ —	$ 10,720,324
Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT)	66,083,355	7,000,000	73,083,355
Atrial Fibrillation Follow-up: Investigation in Rhythm Management (AFFIRM)	14,747,473	2,401,000	17,148,473
Enhancing Recovery in Coronary Heart Disease Patients (ENRICHD)	28,395,927	595,995	28,991,922
Evaluation Study of Congestive Heart Failure and Pulmonary Artery (ESCAPE)	3,570,120	—	3,570,120
Magnesium in Coronaries (MAGIC)	4,420,650	—	4,420,650
Prevention of Events With Angiotensin Converting Enzyme Inhibitor Therapy (PEACE)	18,143,176	—	18,143,176
Public Access Defibrillation (PAD) Community Trial	5,338,224	3,058,000	8,396,224
Women's Angiographic Vitamin and Estrogen Trial (WAVE)	10,302,574	756,046	11,058,620
Women's Ischemia Syndrome Evaluation (WISE)	6,921,798	10,000	6,931,798
Subtotal, Heart and Vascular Diseases	168,643,621	13,821,041	182,464,662
Lung Diseases			
Acute Respiratory Distress Syndrome Clinical Network (ARDSNET)	32,121,000	2,667,000	34,788,000
Childhood Asthma Management Program (CAMP)	48,442,800	1,330,000	49,772,800
Feasibility Studies on Retinoid Treatment in Emphysema (FORTE)	8,595,001	—	8,595,001
National Emphysema Treatment Trial (NETT)	17,669,000	6,989,000	24,658,000
Subtotal, Lung Diseases	106,827,801	10,986,000	117,813,801
Blood Diseases and Resources			
Cord Blood Stem Cell Transplantation Study	27,099,311	1,846,000	28,945,311
Multicenter Study of Hydroxyurea in Sickle Cell Anemia Adult Follow-Up (MSH)	1,650,307	—	1,650,307
Pediatric Hydroxyurea Phase III Clinical Trial (BABY HUG)	1,606,247	404,945	2,011,192
T-Cell Depletion in Unrelated Donor Marrow	9,330,328	1,144,000	10,474,328
Viral Activation Transfusion Study (VATS)	15,007,472	—	15,007,472
Subtotal, Blood Diseases and Resources	54,693,665	3,394,945	30,595,618
Women's Health Initiative			
Subtotal, Women's Health Initiative	433,700,000	59,200,000	492,900,000
Total, NHLBI-Initiated Clinical Trials, Contracts	**$763,865,087**	**$87,401,986**	**$823,774,081**

Cooperative Agreements

	Total Obligations Prior to FY 2001	Total FY 2001 Obligations	Total Obligations to Date
Heart and Vascular Diseases			
Bypass Angiography Revascularization Investigation (BARI)	$ 49,358,272	$ 1,548,634	$ 50,906,906
Girls Health Enrichment Multisite Studies (GEMS)	4,647,092	2,876,659	7,523,751
Obesity Prevention in American Indians (PATHWAYS)	23,804,542	—	23,804,542
Pediatric Cardiovascular Clinical Research Network	—	3,447,570	3,447,570
Trial of Activity in Adolescent Girls (TAAG)	5,273,755	4,831,514	10,105,269
Subtotal, Heart and Vascular Diseases	83,083,661	12,704,377	95,788,038
Lung Diseases			
Childhood Asthma Research and Education (CARE) Network	9,177,140	5,314,414	14,491,554
Subtotal, Lung Diseases	9,177,140	5,314,414	14,491,554
Blood Diseases and Resources			
Blood and Marrow Transplant Clinical Research Network	—	5,360,364	5,360,364
Thalassemia (Cooley's Anemia) Clinical Research Network	2,191,722	2,218,871	4,410,593
Subtotal, Blood Diseases and Resources	2,191,722	7,579,235	9,770,957
Total, NHLBI-Initiated Clinical Trials, Cooperative Agreements	**$94,452,523**	**$25,598,026**	**$120,050,549**
Total, NHLBI-Initiated Clinical Trials	**$858,317,610**	**$113,000,012**	**$943,824,630**

Heart and Vascular Diseases Program

Action to Control Cardiovascular Risk in Diabetes (ACCORD), Initiated in Fiscal Year 1999

The purpose of this study is to evaluate three diabetic treatment strategies (intensive glycemic control, blood pressure control, and fibrate treatment to raise HDL-cholesterol and lower triglycerides) to prevent major cardiovascular events in patients with type 2 diabetes mellitus. The primary outcome measure is CVD mortality or major morbidity (MI and stroke).

Obligations

Funding History:
Fiscal Year 2001—$0
Fiscal Years 1999-2000—$10,720,324
Total Funding to Date—$10,720,324

Current Active Organizations and Grant Numbers

1. Wake Forest University
Winston-Salem, North Carolina —HC-95178
2. McMaster University
Hamilton, Ontario —HC-95179
3. University of Washington
Seattle, Washington —HC-95180
4. Case Western Reserve University
Cleveland, Ohio —HC-95181
5. Wake Forest University
Winston-Salem, North Carolina —HC-95182
6. Minneapolis Medical
Research Foundation
Minneapolis, Minnesota —HC-95183
7. Trustees of Columbia University
of New York
New York, New York —HC-95184

Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT), Initiated in Fiscal Year 1993

The ALLHAT is a practice-based, randomized clinical trial to determine whether combined incidence of fatal CHD and nonfatal MI differs between diuretic-based and newer antihypertensive treatments (angiotensin converting enzyme [ACE] inhibitor, calcium channel blocker, alpha blocker) in high-risk hypertensive patients. The objective of the lipid-lowering component of the study is to determine whether lowering serum cholesterol with an HMG CoA reductase inhibitor reduces the total mortality in a subset of hypertensive patients with moderately elevated LDL cholesterol. Because blacks and Hispanics are at high risk for hypertension and CHD, investigators recruited a high percentage of minorities into the study.

Obligations

Funding History:
Fiscal Year 2001—$7,000,000
Fiscal Years 1993-2000—$66,083,355
Total Funding to Date—$73,083,355

Current Active Organization and Contract Number

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

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

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

Obligations

Funding History:
Fiscal Year 2001—$2,401,000
Fiscal Years 1995-2000—$14,747,473
Total Funding to Date—$17,148,473

Current Active Organization and Contract Number

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

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

The BARI assesses the long-term safety and efficacy of percutaneous transluminal coronary angioplasty (PTCA) and coronary artery bypass graft surgery (CABG) in patients who require revascularization and have coronary anatomy suitable for either procedure. The trial has been extended through November 2002 to complete the minimum 10-year follow-up on all patients and to determine the relative efficacy of PTCA versus CABG in subgroups of women, blacks, diabetics, and the elderly.

Obligations

Funding History:
Fiscal Year 2001—$1,548,634
Fiscal Years 1987-2000—$49,358,272
Total Funding to Date—$50,906,906

Current Active Organization and Grant Number

1. University of Pittsburgh
Pittsburgh, Pennsylvania —HL-38610

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. Reinfarction or death is the primary end point. Secondary outcomes include health-related quality of life. A high percentage of women and minorities have been recruited for the study.

Obligations

Funding History:
Fiscal Year 2001—$595,995
Fiscal Years 1995-2000—$28,395,927
Total Funding to Date—$28,991,922

Current Active Organizations and Contract Numbers

1. University of North Carolina
Chapel Hill, North Carolina —HC-55140
2. University of Alabama at Birmingham
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. Luke's Medical Center
Chicago, Illinois —HC-55144
6. Stanford University
Palo Alto, California —HC-55145
7. Washington University
St. Louis, Missouri —HC-55146
8. University of Washington
Seattle, Washington —HC-55147
9. Yale University
New Haven, Connecticut —HC-55148

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

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

Obligations

Funding History:
Fiscal Year 2001—$0
Fiscal Years 1999-2000—$3,570,120
Total Funding to Date—$3,570,120

Current Active Organization and Grant Number

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

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

The objective of this project is to develop and test interventions to prevent obesity by decreasing weight gain during the high-risk transitional period from pre-puberty to puberty in African American girls who are at high risk for developing obesity.

Obligations

Funding History:
Fiscal Year 2001—$2,876,659
Fiscal Years 1999-2000—$4,647,092
Total Funding to Date—$7,523,751

Current Active Organizations and Grant Numbers

1. University of Memphis
Memphis, Tennessee —HL-62662
2. Stanford University
Stanford, California —HL-62663
3. University of Minnesota, Twin Cities
Minneapolis, Minnesota —HL-62668
4. The George Washington University
Washington, DC —HL-62732
5. Baylor College of Medicine
Houston, Texas —HL-65160

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

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

Obligations

Funding History:
Fiscal Year 2001—$0
Fiscal Years 1998-2000—$4,420,650
Total Funding to Date—$4,420,650

Current Active Organization and Contract Number

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

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

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

Obligations

Funding History:
Fiscal Year 2001—$0
Fiscal Years 1993-2000—$23,804,542
Total Funding to Date—$23,804,542

Current Active Organizations and Grant Numbers

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

Pediatric Cardiovascular Clinical Research Network, Initiated in Fiscal Year 2001

The objective of this study is to establish a clinical network to evaluate novel treatment methods and management strategies for children with structural congenital heart disease, inflammatory heart disease, heart muscle disease, and arrhythmias.

Obligations

Funding History:
Fiscal Year 2001—$3,447,570
Total Funding to Date—$3,447,570

Current Active Organizations and Grant Numbers

1. Duke University
Durham, North Carolina —HL-68269
2. New England Research Institute, Inc.
Watertown, Massachusetts —HL-68270
3. Children's Hospital of Philadelphia
Philadelphia, Pennsylvania —HL-68279
4. Medical University of South Carolina
Charleston, South Carolina —HL-68281
5. Children's Hospital
Boston, Massachusetts —HL-68285
6. Hospital for Sick Children
Toronto, Ontario —HL-68288
7. Columbia University
Health Sciences
New York, New York —HL-68290
8. University of Utah
Salt Lake City, Utah —HL-68292

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

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

Obligations

Funding History:
Fiscal Year 2001—$0
Fiscal Years 1996-2000—$18,143,176
Total Funding to Date—$18,143,176

Current Active Organization and Contract Number

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

Public Access Defibrillation (PAD) Community Trial, Initiated in Fiscal Year 1999

The objective of this program is to determine whether lay volunteers trained in the use of automatic external defibrillators for out-of-hospital cardiac arrest victims will significantly increase survival to hospital discharge compared with community volunteers trained in standard life-saving techniques.

Obligations

Funding History:
Fiscal Year 2001—$3,058,000
Fiscal Years 1999-2000—$5,338,224
Total Funding to Date—$8,396,224

Current Active Organization and Contract Number

1. University of Washington
Seattle, Washington —HC-95177

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

This community-based study is testing the effects of a school-community linked intervention to prevent decline in physical activity and cardiorespiratory fitness seen during adolescence in girls; 37 percent of the population will be minorities.

Obligations

Funding History:
Fiscal Year 2001—$4,831,514
Fiscal Year 2000—$5,273,755
Total Funding to Date—$10,105,269

Current Active Organizations and Grant Numbers

1. University of Minnesota
Minneapolis, Minnesota —HL-66845
2. University of South Carolina
Columbia, South Carolina —HL-66852
3. University of North Carolina at Chapel Hill
Chapel Hill, North Carolina —HL-66853
4. Tulane University
New Orleans, Louisiana —HL-66855
5. San Diego State University
San Diego, California —HL-66856
6. The Johns Hopkins University
Baltimore, Maryland —HL-66857
7. University of Arizona
Tucson, Arizona —HL-66858

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

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

Obligations

Funding History:
Fiscal Year 2001—$756,046
Fiscal Years 1996-2000—$10,302,574
Total Funding to Date—$11,058,620

Current Active Organizations and Grant Numbers

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

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

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

Obligations

Funding History:
Fiscal Year 2001—$10,000
Fiscal Years 1996-2000—$6,921,798
Total Funding to Date—$6,931,798

Current Active Organizations and Contract Numbers

1. University of Alabama at Birmingham
   Birmingham, Alabama —HV-68161
2. University of Pittsburgh
   Pittsburgh, Pennsylvania —HV-68162
3. University of Florida
   Gainesville, Florida —HV-68163
4. Allegheny Singer Research Institute
   Pittsburgh, Pennsylvania —HV-68164

Lung Diseases Program

Acute Respiratory Distress Syndrome Clinical Network (ARDSNET), Initiated in Fiscal Year 1994

The objective of this network is to test new therapeutic agents with a potential for improving the outcome of patients with ARDS and those at risk of developing ARDS.

Obligations

Funding History:
Fiscal Year 2001—$2,667,000
Fiscal Years 1994-2000—$32,121,000
Total Funding to Date—$34,788,000

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
12. Baylor College of Medicine
    Houston, Texas —HR-16146
13. Baystate Medical Center
    Springfield, Massachusetts —HR-16147
14. University of British Columbia
    Vancouver, Canada —HR-16148
15. University of Chicago
    Chicago, Illinois —HR-16149
16. Louisiana State University
    New Orleans, Louisiana —HR-16150
17. University of Pittsburgh
    Pittsburgh, Pennsylvania —HR-16152
18. University of Texas
    San Antonio, Texas —HR-16153
19. University of Virginia
    Charlottesville, Virginia —HR-16154
20. Wake Forest University
    Winston-Salem, North Carolina —HR-16155

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

The purpose of this study is to evaluate the long-term effects of anti-inflammatory therapy compared to bronchodilator therapy on the course of asthma, particularly on lung function and bronchial hyperresponsiveness, and on physical and psychosocial growth and development. Results showed that 4 ½ to 6 years of daily treatment with inhaled corticosteroids was safe and provided superior control of asthma compared to a different anti-inflammatory medication or treatment only when symptoms occurred. The CAMP study will continue to observe the children for 5 years to determine the effect of early treatment on maximum lung growth and on height.

Obligations

Funding History:
Fiscal Year 2001—$1,330,000
Fiscal Years 1991-2000—$48,442,800
Total Funding to Date—$49,772,800

Current Active Organizations and Contract Numbers

1. The Johns Hopkins University
   Baltimore, Maryland —HR-16044
2. University of California, San Diego
   La Jolla, California —HR-16045
3. University of New Mexico
   Albuquerque, New Mexico —HR-16046
4. Hospital for Sick Children
   Toronto, Ontario —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

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

The purpose of this study is to evaluate current and novel therapies and management strategies for children with asthma. Emphasis is on clinical trials that help identify optimal therapy for children with different asthma phenotypes, genotypes, and ethnic backgrounds and children at different developmental stages.

Obligations

Funding History:
Fiscal Year 2001—$5,314,414
Fiscal Years 1999-2000—$9,177,140
Total Funding to Date—$14,491,554

Current Active Organizations and Grant Numbers

1. Washington University
   St. Louis, Missouri —HL-64287
2. National Jewish Medical and Research Center
   Denver, Colorado —HL-64288
3. University of California, San Diego
   San Diego, California —HL-64295
4. University of Wisconsin
   Madison, Wisconsin —HL-64305
5. University of Arizona
   Tucson, Arizona —HL-64307
6. Pennsylvania State University
   Hershey, Pennsylvania —HL-6431

Feasibility of Retinoid Treatment in Emphysema (FORTE), Initiated in Fiscal Year 1999

The purpose of this program is to conduct preliminary studies to identify optimal patient populations, drugs and dosing schedules, and outcome measures before conducting a larger clinical trial on retinoid treatment for emphysema.

Obligations

Funding History:
Fiscal Year 2001—$0
Fiscal Years 1999-2000—$8,595,001
Total Funding to Date—$8,595,001

Current Active Organizations and Grant Numbers

1. University of Minnesota
   Minneapolis, Minnesota —HR-96140
2 Boston University
   Boston, Massachusetts —HR-96141
3. University of Pittsburgh
   Pittsburgh, Pennsylvania —HR-96142
4. University of California
   Los Angeles, California —HR-96143
5. University of California
   San Diego, California —HR-96144
6. Columbia University
   New York, New York —HR-96145

National Emphysema Treatment Trial (NETT), Initiated in Fiscal Year 1997

The NETT is a multicenter trial designed to evaluate the efficacy and role of lung volume reduction surgery (a procedure in which part of the lung is removed in an attempt to improve breathing) in the treatment of severe emphysema. If surgery proves to be effective, a major secondary objective is to determine which patients are most likely to benefit.

Obligations

Funding History:
Fiscal Year 2001—$6,989,000
Fiscal Years 1997-2000—$17,669,000
Total Funding to Date—$24,658,000

Current Active Organizations and Contract Numbers

1. Baylor College of Medicine
   Houston, Texas —HR-76101
2. Brigham and Women's Hospital
   Boston, Massachusetts —HR-76102
3. University of California, San Diego
   San Diego, California —HR-76103
4. Cedars-Sinai Medical Center
   Los Angeles, California —HR-76104
5. Cleveland Clinic Foundation
   Cleveland, Ohio —HR-76105
6. Columbia University
   New York, New York —HR-76106

7. Duke University Medical Center
Durham, North Carolina —HR-76107
8. University of Maryland
Baltimore, Maryland —HR-76108
9. Mayo Foundation
Rochester, Minnesota —HR-76109
10. University of Michigan
Ann Arbor, Michigan —HR-76110
11. National Jewish Center for Immunology and Respiratory Medicine
Denver, Colorado —HR-76111
12. The Ohio State University
Columbus, Ohio —HR-76112
13. University of Pennsylvania
Philadelphia, Pennsylvania —HR-76113
14. University of Pittsburgh
Pittsburgh, Pennsylvania —HR-76114
15. Saint Louis University
St. Louis, Missouri —HR-76115
16. Temple University
Philadelphia, Pennsylvania —HR-76116
17. University of Washington
Seattle, Washington —HR-76118
18. The Johns Hopkins University
Baltimore, Maryland —HR-76119

Blood Diseases and Resources Program

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

The purpose of this network is to promote the efficient comparison of novel treatment methods and management strategies of potential benefit for children and adults undergoing blood or marrow transplantation.

Obligations

Funding History:
Fiscal Year 2001—$5,360,364
Total Funding to Date—$5,360,364

Current Active Organizations and Grant Numbers

1. University of Nebraska Medical Center
Omaha, Nebraska —HL-69233
2. Dana Farber Cancer Institute
Boston, Massachusetts —HL-69249
3. Children's Mercy Hospital
Kansas City, Missouri —HL-69254
4. University of California San Diego
La Jolla, California —HL-69273
5. Duke University
Durham, North Carolina —HL-69274
6. City of Hope Medical Center
Duarte, California —HL-69278
7. University of Pennsylvania
Philadelphia, Pennsylvania —HL-69286
8. University of Minnesota
Twin Cities
Minneapolis, Minnesota —HL-69290
9. Stanford University
Stanford, California —HL-69291
10. Medical College of Wisconsin
Milwaukee, Wisconsin —HL-69294
11. University of Florida
Gainesville, Florida —HL-69301
12. The Johns Hopkins University
Baltimore, Maryland —HL-69310
13. Sloan Kettering Institute for Cancer Research
New York, New York —HL-69315
14. University of Michigan
Ann Arbor, Michigan —HL-69330
15. Case Western Reserve University
Cleveland, Ohio —HL-69348

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

The multicenter study is designed to show whether umbilical cord blood stem cell transplants from unrelated, newborn donors are a safe and efficient alternative to bone marrow transplantation for children and adults with a variety of cancers, blood diseases, and genetic disorders.

Obligations

Funding History:
Fiscal Year 2001—$0
Fiscal Years 1996-2000—$27,099,311
Total Funding to Date—$27,099,311

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. Indiana University
Indianapolis, Indiana —HB-67137
6. Duke University Medical Center
Durham, North Carolina —HB-67138
7. University of Minnesota
Minneapolis, Minnesota —HB-67139

8. Duke University Medical Center
   Durham, North Carolina —HB-67141
9. University of California at Los Angeles
   Los Angeles, California —HB-67142

Pediatric Hydroxyurea Phase III Clinical Trial (BABY HUG), Initiated in Fiscal Year 2000

The objective of this clinical trial is to determine if hydroxyurea therapy is effective in prevention of chronic end organ damage in pediatric patients with sickle cell anemia.

Obligations

Funding History:
Fiscal Year 2001—$404,495
Fiscal Year 2000—$1,606,247
Total Funding to Date—$2,011,192

Current Active Organizations and Contract Numbers

1. Children's Research Institute
   Washington, DC —HB-07150
2. Duke University Medical Center
   Durham, North Carolina —HB-07151
3. Howard University
   Washington, DC —HB-07152
4. The Johns Hopkins University
   Baltimore, Maryland —HB-07153
5. Medical University of South Carolina
   Charleston, South Carolina —HB-07154
6. St. Jude Children's Research Hospital
   Memphis, Tennessee —HB-07155
7. The Research Foundation of SUNY
   New York, New York —HB-07156
8. University of Miami
   Miami, Florida —HB-07157
9. University of Mississippi Medical Center
   Jackson, Mississippi —HB-07158
10. University of Texas Southwestern Medical Center
    Dallas, Texas —HB-07159
11. Clinical Trials and Surveys Corporation
    Baltimore, Maryland —HB-07160

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

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

Obligations

Funding History:
Fiscal Year 2001—$1,144,000
Fiscal Years 1994-2000—$9,330,328
Total Funding to Date—$10,474,328

Current Active Organizations and Contract Numbers

1. The 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

Thalassemia (Cooley's Anemia) Clinical Research Network, Initiated Fiscal Year 2000

The purpose of this network is to accelerate research in the management of thalassemia, standardize existing treatments, and evaluate new ones in a network of clinical centers.

Obligations

Funding History:
Fiscal Year 2001—$2,218,871
Fiscal Year 2000—$2,191,722
Total Funding to Date—$4,410,593

Current Active Organizations and Contract Numbers

1. Children's Hospital of Philadelphia
   Philadelphia, Pennsylvania —HL-65232
2. Hospital for Sick Children
   Toronto, Ontario —HL-65233
3. New England Research Institute, Inc.
   Watertown, Massachusetts —HL-65238
4. Children's Hospital Oakland
   Oakland, California —HL-65239
5. Weill Medical College of Cornell University
   New York, New York —HL-65244
6. Children's Hospital
   Boston, Massachusetts —HL-65260

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

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

Obligations

Funding History:
Fiscal Year 2001—$0
Fiscal Years 1995-2000—$15,007,472
Total Funding to Date—$15,007,472

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
   Chapel Hill, North Carolina —HB-57122
9. University of Pittsburgh
   Pittsburgh, Pennsylvania —HB-57123
10. University of Texas
    Galveston, Texas —HB-57124
11. University of Washington
    Seattle, Washington —HB-57125
12. Central Laboratory:
    Irwin Memorial Blood Center
    San Francisco, California —HB-57126
13. Coordinating Center:
    New England Research Institutes, Inc.
    Watertown, Massachusetts —HB-57127

Women's Health Initiative (WHI), Initiated in Fiscal Year 1992

The purpose of the WHI is to study cardiovascular disease, cancer, and osteoporosis in postmenopausal women. The program consists of three major components: a randomized controlled clinical trial of HRT, dietary modification, and calcium/vitamin D supplementation; an observational study to identify predictors of disease; and a study of community approaches to developing healthful behaviors.

Obligations

Funding History:
Fiscal Year 2001—$59,200,000
Fiscal Years 1992-2000*—$433,700,000
Total Funding to Date—$492,900,000

Current Active Organizations and Contract Numbers

1. Fred Hutchinson Cancer Research Center
   Seattle, Washington —WH-22110
2. Fred Hutchinson Cancer Research Center
   Seattle, Washington —WH-32100
3. University of Minnesota, Twin Cities
   Minneapolis, Minnesota —WH-32101
4. University of Iowa College of Medicine
   Iowa City, Iowa —WH-32102
5. University of Alabama at Birmingham
   Birmingham, Alabama —WH-32105
6. Wake Forest University
   Winston-Salem, North Carolina —WH-32106
7. Northwestern University
   Chicago, Illinois —WH-32108
8. Brigham and Women's Hospital
   Boston, Massachusetts —WH-32109
9. University of Medicine and Dentistry of New Jersey
   Newark, New Jersey —WH-32110
10. Emory University
    Atlanta, Georgia —WH-32111
11. University of Pittsburgh
    Pittsburgh, Pennsylvania —WH-32112
12. University of California, Davis
    Davis, California —WH-32113
13. University of Arizona
    Tucson, Arizona —WH-32115
14. University of Tennessee
    Memphis, Tennessee —WH-32118
15. Memorial Hospital of Rhode Island
    Pawtucket, Rhode Island —WH-32119
16. University of California, San Diego
    San Diego, California —WH-32120
17. State University of New York at Buffalo
    Buffalo, New York —WH-32122
18. University of California, Irvine
    Irvine, California —WH-42107
19. The George Washington University
    Washington, DC —WH-42108
20. Stanford University
    Palo Alto, California —WH-42109
21. Baylor College of Medicine
    Houston, Texas —WH-42110
22. University of Texas Health Science Center at San Antonio
    San Antonio, Texas —WH-42111
23. The Ohio State University
    Columbus, Ohio —WH-42112
24. University of Nevada School of Medicine
    Reno, Nevada —WH-42113
25. Kaiser Foundation Research Institute
    Oakland, California —WH-42114
26. State University of New York at Stony Brook
    Stony Brook, New York —WH-42115
27. University of Massachusetts Medical School
    Worcester, Massachusetts —WH-42116
28. University of North Carolina at Chapel Hill
    Chapel Hill, North Carolina —WH-42117
29. Wayne State University
    Detroit, Michigan —WH-42118
30. Albert Einstein College of Medicine
    New York, New York —WH-42119

* This figure reflects funding for the clinical trials and observational studies only. From 1992-98, major support was provided through the Office of the Director, NIH. The Community Prevention Study receives funding through an interagency agreement with the Centers for Disease Control and Prevention: $4,000,000 in FY 1999 and $12,000,000 from FY 1996-98.

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

12. Minority Activities

Throughout its history, the NHLBI has been a leader in conducting and supporting research to eliminate health disparities that exist between various segments of the U.S. population. The Institute has initiated research projects with significant minority participation in order to compare health status between various populations. In addition, it has given high priority to programs that focus exclusively on minority health issues.

Since FY 1991, the Institute has had procedures in place to ensure full compliance with the NIH Policy on Inclusion of Minorities and Women in Research. As a result, all NHLBI-supported research that involves human subjects includes minorities, with the exception of a very few projects for which a strong justification for limiting the diversity of the study population exists. Thus, all segments of the population, both minority and nonminority, stand to benefit from the Institute's research programs.

The NHLBI supports activities that foster increased participation by minorities in biomedical research through outreach to high schools, colleges, and universities, especially minority institutions. It also actively recruits minorities into its training and career development programs (see Chapter 13). In addition, a recent FY 2000 initiative provides funds for research infrastructure enhancement at minority-serving institutions. The overall aim of these efforts is to ensure that highly qualified investigators from various racial and ethnic populations are available to conduct future research in heart, lung, and blood diseases and sleep disorders.

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

Listed below are selected current projects that focus on minority populations and reflect the Institute's research portfolio related to minority health; additional information can be found in Chapters 9 through 11.

Heart and Vascular Diseases

Risk Factors

Epidemiology

Long-term epidemiologic studies are pivotal in uncovering risk factors that lead to disease. The Institute has initiated several major studies of heart disease focused significantly or completely on minority populations.

- Early Natural History of Arteriosclerosis (see Chapter 9): Examines the association between genetic factors and the evolution of CVD risk factors in childhood and the later development of atherosclerosis and hypertension in a childhood population that has now reached adulthood; 36 percent of the participants are black.
- CARDIA (see Chapter 10): Determines the evolution of CHD risk factors in young adults and lifestyle characteristics that may influence development of risk factors prior to middle age; 50 percent of the participants are black.
- ARIC (see Chapter 10): Investigates the association of CHD risk factors with development of atherosclerosis and CVD in an adult population; 38 percent of the participants are black.
- CHS (see Chapter 10): Examines risk factors for CHD and stroke in the elderly; 20 percent of the participants are minorities.
- Strong Heart Study (see Chapter 9): Compares risk factor levels and morbidity and mortality from CVD among American Indians from three different geographic locations.
- JHS (see Chapter 10): Identifies environmental and genetic factors influencing the evolution and progression of CVD in blacks.
- MESA (see Chapter 10): Examines the characteristics of subclinical CVD that predict progression to clinically overt CVD and related risk factors that predict subclinical disease in blacks, whites, Hispanics, and Asians; 62 percent of the participants are minorities.

Several investigator-initiated epidemiological studies are examining gene-environment interactions that increase CVD risk factors among several racial groups. For example, one study compares gene-environment interaction in black populations in Africa, the Caribbean, and selected areas of the United States. Another study examines links between DNA sequence variations in specific genes associated with key physiological functions involved in CVD development and variation in quantitative CVD risk factors among Japanese and Pacific Islanders. The aim of a third study is to identify and map specific genes that contribute to CVD risk in Native Alaskans.

Research on gene-diet-induced atherosclerosis susceptibility is being conducted in Costa Rica. Scientists are investigating whether genetic variants that modulate the effect of intake of specific fatty acids promote atherosclerosis and increase the incidence of CHD.

A study of the etiology of atherosclerosis focusing on diet and oxidative mechanisms examines new risk factors that promote or inhibit LDL damage and inflammatory responses in the artery wall. Researchers seek to determine the relationship between longitudinal change in atherosclerosis and dietary antioxidants, antioxidant enzymes, and genetic polymorphisms in a diverse population consisting of more than 50 percent Hispanics.

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

As a follow-up to the Institute-initiated Studies of Children's Activity and Nutrition, independent investigators are tracking the original cohort from childhood to adolescence. One project has added smoking behavior, feelings associated with depression, peer influences, and changing parental influences to CVD risk factors being assessed in a Mexican-American population. Another project focuses on development of cardiovascular reactivity and its influence on early pathobiologic markers of CHD prior to overt manifestation of disease; 41 percent of the participants are black.

An ancillary study to the MESA seeks to discover whether impairment of myocardial perfusion reserve can serve as a marker of CHD. Scientists hypothesize that impaired myocardial perfusion reserve indicates the presence of subclinical coronary atherosclerosis and coronary microvascular disease. Developing a new measure of subclinical disease would open new opportunities for intervention and lifestyle modification to prevent CHD. Fifty percent of the population will be Hispanic.

Treatment and Prevention

Because CVD evolves over a period of decades, early intervention programs designed to reduce multiple risk factors can aid in preventing CVD in later years. To this end, the Institute supports several investigator-initiated intervention studies among diverse populations. For example, one project is comparing the effectiveness of a community-based intervention using neighborhood health care workers to a program that provides assistance through referral to primary care resources. Individuals are encouraged to lower their blood pressure, LDL-cholesterol, and dietary fat; increase their physical activity; and stop smoking. High risk siblings of blacks with premature coronary disease are targeted.

Another project uses churches to promote adoption of a healthy lifestyle among blacks. Scientists are evaluating the effectiveness of two nutrition and exercise interventions conducted at several black churches in Atlanta.

Researchers are seeking to determine how demographic and cultural factors contribute to diet and sedentary practices that lead to CVD among Hispanic women in order to develop a cardiovascular intervention program tailored to this population.

Education

The NHLBI, through its education programs (see Chapter 2), disseminates health information to physicians, health care professionals, patients, and the public on ways to prevent or treat diseases that are within its mandate. The Institute has developed the following programs to combat cardiovascular health disparities among four major cultural/ethnic groups—blacks, Asians, Hispanics, and American Indians.

- National Physicians' Network: Provides continuing education opportunities and treatment information

to clinicians and other health professionals who provide health care to blacks. A Web-based interactive self-study education program for doctors and nurses has been developed and is in the process of being tested.
- National Asian American and Pacific Islanders Heart Health Outreach Project: Develops culturally and linguistically appropriate activities to increase community awareness of heart disease and its associated risk factors and promotes the adoption of heart-healthy lifestyles among a diverse Asian population.
- Salud para su Corazón: Disseminates information on CVD prevention, intervention, and treatment and promotes heart-healthy behaviors in Hispanic communities.
- Strengthening the Heartbeat of American Indian/ Alaska Native Communities: Develops culturally appropriate informational material to encourage heart-healthy behavior in three tribal communities.

In addition to the activities mentioned above, the Institute prepares publications on CVD prevention for minority populations. Included are:

- *Improving Cardiovascular Health in African Americans—Package of Seven Easy-To-Read Booklets*
- *Package of Eight Easy-To-Read Booklets in Spanish and English on Preventing Heart Disease*
- *From Heart to Heart: A Bilingual Group Discussion Guide (includes videotape)* in English and Spanish
- *Bringing Heart Health to Latinos: A Guide for Building Community Programs*
- *Photonovella and CVD Prevention Workbook.*

High Blood Pressure

Etiology and Pathophysiology

High blood pressure is a serious health problem that is especially prevalent and severe among minorities. Institute-initiated studies in the etiology and pathophysiology of high blood pressure include:

- Molecular Genetics of Hypertension (see Chapter 9): Determines the etiology and pathogenesis of hypertension and its complications in order to improve diagnosis and treatment of the disease. Many of the subprojects have a high percentage of minority participation; others target blacks or Hispanics exclusively.
- Family Blood Pressure Program (see Chapter 9): Uses a collaborative network of investigators to identify genes associated with high blood pressure and to research the interactions between genetic and environmental determinants of hypertension in specific minority populations.

The Institute supports a number of investigator-initiated projects that examine antecedents of hypertension in children to determine racial differences in blood pressure regulation. Researchers are investigating relationships between cardiovascular reactivity in adolescent normotensive blacks and development of pathobiologic markers of hypertension risk (i.e., increased resting blood pressure, left ventricular mass, and relative wall thickness) later in life.

Nitric oxide (NO) is associated with blood pressure regulation and may influence the development of hypertension. A new study assesses the importance of vascular NO production in the regulation of cardiovascular responses to stress and racial and gender differences in this process.

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

Clarifying the role of insulin and race on cardiovascular reactivity to stress is another area of interest. Researchers postulate that blacks and patients with increased insulin have increased total peripheral resistance and cardiac output.

Scientists are also examining the influence of SES on stress reactivity to determine if this is the pathophysiologic link to CVD in blacks. One group is studying the combined influence of low SES and ethnicity on the

development of behavioral risk factors and testing the extent to which they mediate associations between sociodemographic factors, stress, and cardiovascular markers in adolescents. Another group is assessing the relationship between early life exposure to socioeconomic stressors, such as adverse socioeconomic conditions, low levels of social integration, and racial discrimination, and development of hypertension in blacks.

The role of dietary factors, particularly macronutrients, in the etiology of high blood pressure is another area under investigation. Scientists are conducting epidemiologic studies among participants with diverse ethnicity, SES, and dietary habits in four countries to determine the impact of dietary components (e.g., proteins, lipids, carbohydrates, amino acids, calcium, magnesium, antioxidants, fiber, and caffeine) on blood pressure.

The NHLBI supports a number of studies to identify genes linked to hypertension in blacks, Mexican Americans, and whites to determine if part of the disparity in prevalence can be attributed to genetic differences among the groups. Genes under investigation include those associated with the renin-angiotensin system, the kallikrein-kinin system, and those involved with sodium transport.

Asians living in rural China are the focus of another project that is seeking to identify genes associated with hypertension. By selecting an isolated population, researchers expect that the genetic factors contributing to the disorder will be less heterogeneous and thus more readily detected.

Hypertension associated end-stage renal disease is more prevalent in blacks than in whites. Researchers are seeking to identify genes linked to this disorder among blacks. Once the genes are identified, they will serve as a genetic basis for detecting high risk individuals and developing prevention interventions and treatment strategies.

Treatment and Prevention

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

- ALLHAT (see Chapter 11): Compares the combined incidence of fatal CHD and nonfatal MI among patients receiving angiotensin converting enzyme (ACE) inhibitors, calcium antagonists, or alpha-1-blockers and patients in a control group receiving a diuretic. Also, using a subset of these groups, determines whether cholesterol-lowering therapy reduces mortality in moderately hypercholesterolemic individuals compared with a control group; 32 percent of the participants are black and 19 percent are Hispanic.
- DASH Sodium (see Chapter 9): Compared the effects of three levels of sodium intake and two different diets (reference diet versus diet high in fruits, vegetables, and dairy products and low in fat) on blood pressure; 50 percent of the participants are black.
- PREMIER (see Chapter 9): Compares the effectiveness of two multicomponent lifestyle interventions on blood pressure control. Interventions include reduced salt intake, increased physical activity, moderation of alcohol intake, and weight loss. In addition, one of the two interventions includes the DASH diet. Forty percent of the participants are black.

Understanding racial differences in blood pressure control is an area of major interest for the Institute. Scientists are examining whether variation in genes of the renin-angiotensin-aldosterone system predicts interindividual differences in blood pressure response to diuretic therapy among hypertensive blacks and whites. Another group is focusing on variations in the ACE gene between blacks and whites to explain racial differences in the antihypertensive responsiveness to ACE inhibitors.

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

The NHLBI supports research involved in developing effective approaches to improve patient compliance with therapy. One project being funded is evaluating the ability of an electronic home monitor that can transmit vital signs from a patient's home to a physician's office to improve hypertension care among a black patient population. Another project is testing the effectiveness of a multicomponent adherence promotion intervention among low-income blacks. It incorporates individual

assessment and tailored feedback intended to help patients develop behavior management skills that enhance consistent medication use.

Education

The NHBPEP (see Chapter 2) has developed a number of outreach programs to inform minority populations of the importance of blood pressure control. Included are a public information center accessible by a toll-free number that provides material on hypertension in English or Spanish; mini-telenovelas (*Más vale prevenir que lamentar*), "health moments" to reinforce CVD prevention for local Spanish-language television stations; a Spanish version of the High Blood Pressure Education Month Kit; and several publications for health professionals, patients, and the public. They include:

- *Control de la Presión Arterial Alta: Guía Para La Mujer de Edad Mayor*
- *Controlling High Blood Pressure: A Guide for Older Women* in English and Spanish
- *Take Steps—Prevent High Blood Pressure* in English and Spanish
- *Cut Down on Salt and Sodium* in English and Spanish
- *Churches as an Avenue to High Blood Pressure Control*
- *Working With Religious Congregations: A Guide for Health Professionals*
- *Spice Up Your Life! Eat Less Salt and Sodium*
- *Protect Your Heart! Prevent High Blood Pressure.*

High Serum Cholesterol

Etiology

The Institute supports a number of investigator-initiated projects to identify specific genes that influence the lipoprotein profile within various racial and ethnic groups. Research findings could offer an explanation for differences in susceptibility to CHD found among these populations.

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

Variation in hepatic lipase activity is associated with interindividual differences in plasma concentrations of HDL and LDL synthesis and catabolism. Researchers are investigating whether the ethnic differences in hepatic lipase activity are responsible for the well-known differences in plasma HDL concentrations found in blacks and whites. Genetic studies are being conducted on a population that is 39 percent black.

Prevention

The NHLBI is supporting an investigator-initiated study initiated among minority preschool children to track the long-term effectiveness of nutrition interventions on blood cholesterol and diet. Additional potential risk factors, such as increased blood pressure, obesity, and intention to smoke, will be monitored.

Education

The NCEP (see Chapter 2) has a number of publications written for minority audiences. Two booklets, in Spanish and English, explain what Hispanic families can do to reduce their risk of heart attack or stroke. Cookbooks designed for minority audiences are also available; they contain recipes that are low in fats, especially saturated fat, and cholesterol:

- *Learn Your Cholesterol Number* in Spanish and English
- *Protect Your Heart—Lower Your Blood Cholesterol* in Spanish and English
- *Heart-Healthy Home Cooking African American Style*
- *Delicious Heart-Healthy Latino Recipes*
- *Cut Down on Fat—Not on Taste* in Spanish and English
- *Be Heart Smart! Eat Foods Lower in Saturated Fat and Cholesterol*
- *Empower Yourself! Learn Your Cholesterol Number.*

Obesity

Etiology

The latest NHANES data show that the proportion of Americans who are overweight continues to rise, and black women are especially at risk. To understand the reasons for the racial disparity among women, the Institute initiated a long-term program, the NHLBI Growth and Health Study (NGHS), to examine the development of obesity and CVD risk factors in a biracial cohort of

young girls. The study, which ended in FY 2000, found black girls consumed more calories and a higher percentage of calories from fat and watched more television than white girls. An investigator-initiated study using the NGHS cohort, starting at ages 18 to 19 years, is examining the changes in cardiac output and total peripheral resistance that occur with developing obesity and the influence of these changes on ethnic difference in blood pressure regulation. Another project, using data from the NHGS, is examining CHD risk factors in black and white girls with the goal of identifying genes involved in determining black-white differences in lipid metabolism and obesity.

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

Prevention

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

- GEMS (see Chapter11): Tests the effectiveness of weight-control interventions (involving diet, physical activity, and psychosocial and familial influences) administered during the critical transition period from prepuberty to puberty in black girls at high risk for obesity.
- PATHWAYS (see Chapter 11): Tests school-based intervention to prevent obesity in American Indian elementary schoolchildren.

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

A school-based study involving predominately minority children is determining whether reduced use of television, videotapes, and video games prevents obesity. Another project with a subject population consisting of Asians, Hispanics, and whites is testing an integrated school- and community-based intervention involving physical activity and diet to reduce the prevalence of obesity.

Black women are the subjects of a weight management program specifically tailored to the psychosocial, sociocultural, and health perspectives and life circumstances of the participants. A study is using data from the NHANES III to determine whether multiple perceptions and behaviors related to weight loss cluster according to sociodemographic characteristics. Its results should provide information that will contribute to the design of culturally sensitive intervention strategies for minorities. Blacks and Mexican Americans at various SES levels constituted the major portion of the population surveyed.

Education

The NHLBI OEI (see Chapter 2) has written two booklets on losing excess weight targeted to minorities:

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

Physical Inactivity

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

- TAAG (see Chapter 11): Evaluates school-community linked interventions to prevent the decline in physical activity in adolescent girls; approximately 37 percent of participants will be minorities.

The NHLBI supports several investigator-initiated studies on strategies to increase physical activity among minority populations. Among them are studies that examine the effect of vigorous exercise on reduction of childhood obesity in black girls. Adolescent girls are the focus of a number of projects that seek to determine the optimal amount of exercise required for primary prevention of CHD, provide culturally relevant physical activities, enhance social support for exercise, and test the effects of different amounts and intensities of physical activity on CVD risk factors. Hispanic women and women with low SES and literacy skills are subjects in two projects that seek to encourage sustained increases in physical activity among sedentary and hard-to-reach groups. One project also aims to discover the degree of generalization of activity from mother to husband and children.

Education

The Institute has prepared two booklets for minorities on why physical activity is important and ways to become more physically active:

- *Stay Active and Feel Better* in English and Spanish
- *Energize Yourself! Stay Physically Active.*

Smoking

The Institute supports a number of investigator-initiated smoking intervention and follow-up cessation maintenance studies that specifically target minorities. Two studies target minority pregnant women. One of them will evaluate the effectiveness of a smoking cessation program for pregnant smokers delivered as part of routine care by nurses. The other will bring together prenatal care providers with researchers to assess the effectiveness of three programs to reduce smoking among pregnant women; blacks and Hispanics will make up a significant portion of the participants.

Investigators are evaluating the effectiveness of two smoking cessation programs by intervening with smokers who seek treatment at the hospital emergency department. One study involves patients who suffer from acute respiratory illness; approximately 35 percent are minorities. The other targets Chinese-American patients hospitalized with CVD, pulmonary disease, or diabetes mellitus.

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

Education

The Institute has written two booklets on smoking cessation for minorities:

- *Kick the Smoking Habit* in English and Spanish
- *Refresh Yourself! Stop Smoking.*

Psychosocial Factors

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

- ENRICHD (see Chapter 11): Determines the effects of psychosocial interventions on morbidity and mortality in post-MI patients who are depressed and socially isolated and/or who perceive themselves as lacking support from family and friends; 35 percent of the participants are minorities.

The Institute also supports investigator-initiated research on the role of race and ethnicity, psychosocial and environmental factors, and low SES in the development of CHD. Investigators are targeting their efforts on the role of biobehavioral factors in the etiology, pathogenesis, and course of CHD.

Additional areas of interest include the genetic basis of aggression and the relationships between behavioral risk-promoting variables (psychosocial stress, smoking, poor diet, physical inactivity); presumed mediating variables (sympathetic nervous system activity and insulin metabolism); and CHD risk factors; 50 to 65 percent of the population within the subprojects are black or Hispanic.

Ischemic Heart Disease

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

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

Diabetes

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

- Glucose Tolerance and Risk for Cardiovascular Disease in the Elderly (see Chapter 9): Examines the longitudinal relationship between impaired glucose tolerance, insulin resistance, CVD risk factors, and CVD among Japanese-American men.
- ACCORD (see Chapter 11): Evaluates the benefits of different therapies to reduce CVD in adult-onset diabetes; 33 percent of the participants are minorities.

The NHLBI supports several investigator-initiated studies on the genetic relationships between noninsulin-dependent diabetes mellitus (NIDDM) and atherosclerosis. They include a study among two sets of Hispanic families with NIDDM, one with CHD and one without; a study in Mexican Americans to determine common genes linking insulin resistance and coronary artery disease; a project in Japanese-American families to characterize the genetic epidemiology of CHD risk factors (high LDL, risk factors that characterize the insulin resistance syndrome and NIDDM, and lipoprotein(a) levels and apolipoprotein(a) phenotypes); and a project in blacks and Hispanics to examine genetic determinants of insulin resistance and visceral adiposity.

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

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

Lung Diseases

The NHLBI supports research on a number of lung diseases such as asthma, sarcoidosis, and TB that disproportionately affect minorities.

Asthma

Etiology and Pathophysiology

Asthma is a chronic lung disease characterized by inflammation of the airways. Various genetic and environmental factors contribute to the severity of symptoms. Understanding the role each factor plays in the development of the disorder is a major goal of asthma research.

- CSGA (see Chapter 9): Seeks to identify genes associated with asthma and their function in the development of the disease; 58 percent of the participants are minorities.

The NHLBI also supports a number of investigator-initiated projects on the etiology and pathophysiology of asthma. One group of scientists is using genomic screening to search for the genetic basis of asthma in a large sample of Asian siblings who are already known to differ widely in their airway responsiveness (sensitivity to histamine) and lung function. Another group is examining gene-environment interactions in the development of immune responses in a pediatric population that is genetically predisposed to asthma; 40 percent of the population is Hispanic. A third group is focusing on mechanisms by which environmental factors trigger the onset of asthma. Investigators are examining the role of viruses in exacerbation of asthma in a population that is 50 percent minority. In another project consisting of 40 percent minorities, scientists are studying how pulmonary infection due to *mycoplasma pneumoniae* exacerbates asthma and prolongs abnormalities in lung function.

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

Treatment and Control

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

- ACRN (see Chapter 9): Establishes an interactive network of asthma clinical research groups to conduct studies of new therapies for asthma and disseminate findings to the practicing community. Overall, 37 percent of the participants are from minority populations.
- CAMP (see Chapter 11): Determined that inhaled corticosteroids are safe and effective for long-term treatment of children with mild-to-moderate asthma. The therapy proved more effective than

nonsteroidal anti-inflammatory medication and significantly reduced airway hyperresponsiveness. The only side-effect was a transient slowing in growth rate during the first year of treatment; 26 percent of the participants are minorities.

- CARE (see Chapter 11): Establishes a network of pediatric clinical care centers to determine optimal treatment and management strategies for children with asthma. The study will attempt to customize therapy based on specific asthma phenotypes and genotypes; 30 percent of the population will be minorities.

The Institute is also supporting an investigator-initiated study on the effect of steroids on enhanced alpha-adrenergic vascular responsiveness in asthma; 77 percent of the population is minority.

Translational Activities

Ensuring full use of modern asthma treatment strategies is an important goal of the NHLBI. The Institute supports a number of investigator-initiated projects to evaluate the effectiveness of various strategies to control asthma. One study, conducted in black communities in Baltimore is examining the effectiveness of two asthma interventions in reducing emergency room visits, improving adherence to medication schedules, and altering asthma morbidity. One strategy provides assistance to families in accessing medical care; the other combines this assistance with a family intervention to encourage consistent use of asthma medication. Another study examines whether shared decision-making between patient and physician in choosing asthma therapy improves adherence; 82 percent of the population is minority.

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

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

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

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

A randomized controlled trial is being conducted among young black children recruited at the time of an emergency department visit for asthma exacerbation. Investigators are testing the effectiveness of an intervention strategy that includes case management, telephone contacts, and a monetary incentive to increase follow-up visits to primary care providers.

Education

The NAEPP (see Chapter 2) has developed easy-to-read material on asthma treatment and control directed to audiences with low literacy:

- *Facts About Controlling Your Asthma*
- *El asthma: cómo controlar esta enfermedad.*

Chronic Lung Disease

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

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

weeks postmenstrual age; 55 percent of the infants will be from minority populations.

Sarcoidosis

Sarcoidosis is an inflammatory disease of unknown etiology that effects the lungs. Institute-initiated research directed towards understanding the disproportionate prevalence of sarcoidosis among blacks and women include:

- ACCESS (see Chapter 10): Assesses the role of environmental and familial factors in the etiology of sarcoidosis; 43.5 percent of the study participants are minorities.
- Sarcoidosis Genetic Linkage Consortium (see Chapter 9): Identifies genes linked to sarcoidosis susceptibility and determines how they interact with environmental risk factors to cause sarcoidosis; 100 percent of the patient population is black.

Investigator-initiated studies on the causes of sarcoidosis include a study to identify genes linked to sarcoidosis susceptibility in blacks and to determine if hereditary susceptibility predisposes blacks to sarcoidosis and a project to elucidate the mechanisms involved in the immunologic and inflammatory processes that ultimately lead to end-stage fibrosis in progressive pulmonary sarcoidosis; 50 percent of the participants are black.

Sleep Disorders

The NHLBI supports research on the etiology, pathophysiology, and consequences of sleep-disordered breathing (SDB), especially obstructive sleep apnea (OSA). In 1999, the Institute initiated a program to study OSA in children. Six institutions received funding to conduct research in SDB and its neuropsychological, cognitive, and behavioral consequences. The objectives are to develop a better understanding of breathing and sleep in children with SDB, examine any possible anatomical or physical determinants of SDB, and assess associations between behavioral and neuropsychological measures and SDB measures. Minority participation ranges from 28 to 70 percent, depending on the project.

The Institute also supports investigator-initiated projects on SDB in adults, including a longitudinal study to characterize the natural history and biologic spectrum of SDB in a middle-aged Asian (Hmong) population known to be at high risk for sudden death during sleep and a longitudinal study in 300 families, approximately 38 percent black, to derive a detailed phenotypic characterization of OSA and OSA-associated comorbidities.

Treatment strategies are another area of interest. Scientists are comparing the effects of continuous positive airway pressure to no therapy in an elderly population with OSA. Special attention is directed to the recruitment of blacks.

Tuberculosis

Since 1993, the NHLBI has funded five annual competitions for Tuberculosis Academic Awards (TBAAs). The broad goal of the TBAA program is to improve prevention, management, and control of TB by supporting increased opportunities for health-care practitioners to learn modern principles and practices. The objectives are to promote coordinated clinical approaches to the care of patients of various ethnic groups who have TB; raise awareness among health care providers of unique ethnic cultural, and socioeconomic dimensions of TB; focus educational efforts in areas where TB incidence is persistently high (e.g., immigrant communities, refugee centers, homeless shelters, correctional facilities); promote development of minority faculty capable of providing appropriate instruction in diagnosis and management of TB; and enhance TB education programs in minority medical schools and in the communities they serve. A total of 24 awards have been made since inception; 12 grants received funding in FY 2001.

In 2001, the Institute initiated a program on Genetic Aspects of Tuberculosis in the Lung. Four of the 10 awards were given to institutions conducting genetic studies in humans to characterize genes associated with TB susceptibility and host immune responses to infection. Major minority participation is expected.

The NHLBI supports a number of investigator-initiated studies focused on understanding the relationship of the immune system to TB. Most of the patients are from minority populations with HIV. One group seeks to identify the correlates of protective immunity in a Mexican population in order to aid development of anti-TB vaccines. Another group will conduct a Phase I safety trial on a vaccine with a patient population consisting of 85 percent minorities. A third group is examining the role of interferon-gamma in the pathogenesis of TB among Hispanics with and without HIV. Using a patient population that is 100 percent Asian, a fourth

group is identifying and characterizing host factors that predispose individuals to develop TB.

The NHLBI also supports investigator-initiated research to improve TB control among minority populations. Two projects evaluate educational strategies to improve adherence to medication regimes and regular clinic visits among TB-infected adolescents from minority communities in California. The program, based in San Diego, is specifically directed towards Hispanic adolescents; the Los Angeles program encompasses Hispanic and Asian-American communities. A third project has been very effective in administering TB prophylaxis to a mostly homeless population in San Francisco. In Chicago, investigators are testing a TB community-outreach intervention that is modeled after a program previously developed for AIDS prevention among injection-drug users. Another study, located in the Harlem community of New York City, is comparing several methods of ensuring completion of treatment among inner-city TB patients. An extension of this research has been funded to test a new strategy to promote adherence to therapy.

Blood Diseases

Sickle Cell Disease

Sickle Cell Disease (SCD) affects approximately 72,000 people in the United States, most of whom trace their ancestry to Africa. The disease occurs in about 1 in every 500 blacks born in the United States.

Since 1972, the NHLBI has supported an extensive research program to improve understanding of the pathophysiology of SCD and uncover better approaches to its diagnosis and treatment and prevention of complications.

Institute-initiated programs that were active during FY 2001 include the following:

- Comprehensive Sickle Cell Centers Program (see Chapter 9): Provides a multidisciplinary research approach focused on expediting development and application of new knowledge for improved diagnosis and treatment of SCD and prevention of its complications.
- Transfusion Biology and Medicine (see chapter 9): Establishes—through one of the projects under this SCOR—a human umbilical cord blood bank to expand opportunities for stem cell research and perhaps lead to a cure for SCD using transplanted stem cells. The target population is black.

The Institute also supports a large portfolio of investigator-initiated basic and clinical research.

Basic Research

In an attempt to find a cure for all SCD patients, the NHLBI sponsors research into gene therapy as a possible approach. This technically difficult work is being pursued actively by researchers around the country.

Animal models of SCD are being developed and used to evaluate new drugs and to study gene regulation, gene therapy, blood flow, and pathogenic mechanisms.

The NHLBI Reference Laboratory to Evaluate Therapies for SCD is using a battery of standardized tests for preclinical evaluation of potential new therapeutic agents for SCD.

Over the past few years, support has increased for the idea that SCD should be viewed as a disease of the blood vessels as well as a disease of abnormal hemoglobin. Researchers are investigating the effects of blood cells on the endothelium (the lining of blood vessels) in SCD patients, with the expectation that the findings may ultimately point the way to new therapies.

Clinical Research

Since 1991, the Multicenter Transplantation Study has been evaluating the use of bone marrow transplantation for children with SCD who have HLA-matched sibling donors. Researchers are currently exploring a mixed-chimerism protocol for children that would allow a less-toxic regimen than the one currently used before a transplant. The Induction of Stable Chimerisms for Sickle Cell Anemia study is investigating, in a minority population, a transplant procedure that significantly reduces the toxicity of hematopoietic cell transplantation, yet retains its therapeutic benefit. The novel approach relies upon the ability of the host to accept and maintain the cells from the donor under conditions achieved by combining less toxic, nonmyeloablative, pretransplant therapy with modulated postgrafting immunosuppression to control host-versus-graft and graft-versus-host reactions.

The Pediatric Hydroxyurea Study Group was established in 1994 to test the safety and efficacy of hydroxyurea use in children and infants with SCD. It showed that children respond to the medication in a manner sim-

ilar to adults; fetal hemoglobin levels and total hemoglobin increased while complications associated with sickle cell anemia decreased. In addition, the study demonstrated that the drug does not adversely affect growth and development between ages 5 and 15 years. To study the effectiveness of hydroxyurea in preventing onset of chronic organ damage in young children with end-stage sickle cell anemia, the NHLBI began the Phase III Pediatric Hydroxyurea Clinical Trial (BABY HUG) in September 2000. The trial will recruit 200 children between the ages of 6 months and 2 years with the disorder.

Several investigators are examining the unusual features of basal nutrient metabolism and resting energy expenditure that have been found in children and adults with SCD. The studies may improve understanding of impaired growth seen in children with SCD and suggest changes in nutritional intake that may be required by both children and adults with SCD.

The STOP II trial was initiated in 2000 to take advantage of the findings from the original STOP trial that showed that periodic blood transfusions can reduce the incidence of stroke in high-risk patients identified with transcranial Doppler ultrasound. Investigators seek to optimize the treatment in a minority pediatric population.

The role of daily stress, mood, and coping processes related to SCD pain is being studied to determine whether stress and negative mood are associated with more frequent and severe pain. If a causal link is established, researchers will seek to develop an effective pain management intervention that can improve the quality of life for SCD patients.

Education

The NHLBI has developed a number of publications on SCD that target minorities:

- *Datos Sobre La Anemia Falciforme* (Facts About Sickle Cell Anemia)
- *Facts About Sickle Cell Anemia*
- *Management and Therapy of Sickle Cell Disease.*

Cooley's Anemia

Cooley's anemia is an inherited disorder of the red blood cell that affects primarily people of Mediterranean, African, Southeast Asian, Chinese, and Asiatic Indian origin.

NHLBI research in Cooley's anemia includes efforts to develop oral chelators to remove the iron overload caused by repetitive transfusion therapy, exploration of hormone therapy for patients surviving into their teens, testing of drugs to enhance fetal hemoglobin production (hydroxyurea and butyrate), investigation of gene therapy approaches to cure the disease, prevention of bone disease, optimum treatment of hepatitis, treatment of heart disease and iron overload, noninvasive ways of measuring iron burden, development of in utero therapies to treat or cure affected fetuses, and studies to improve the safety of the Nation's blood supply.

In FY 2000, the Institute initiated a program to establish a network of clinical research centers capable of performing clinical trials of promising new therapeutic agents.

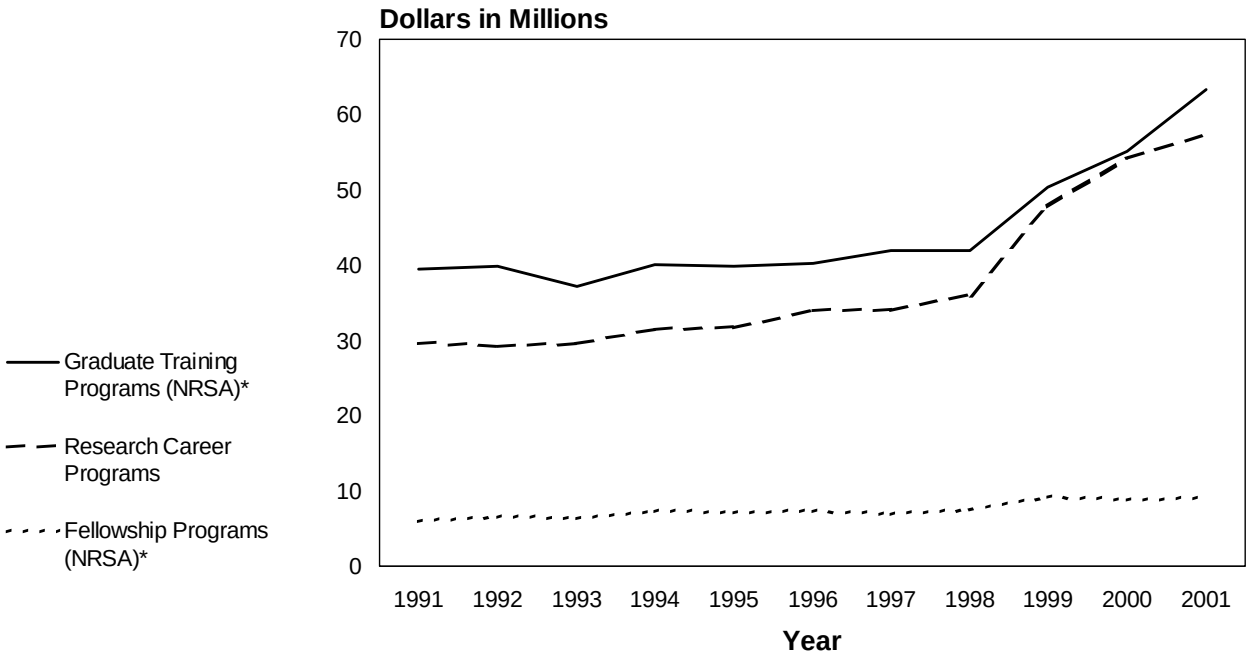
- Thalassemia (Cooley's Anemia) Clinical Research Network (see Chapter 11): Establishes a network of clinical centers to study the effectiveness of specific interventions to reduce morbidity and mortality from the disorder.

Women's Health Initiative

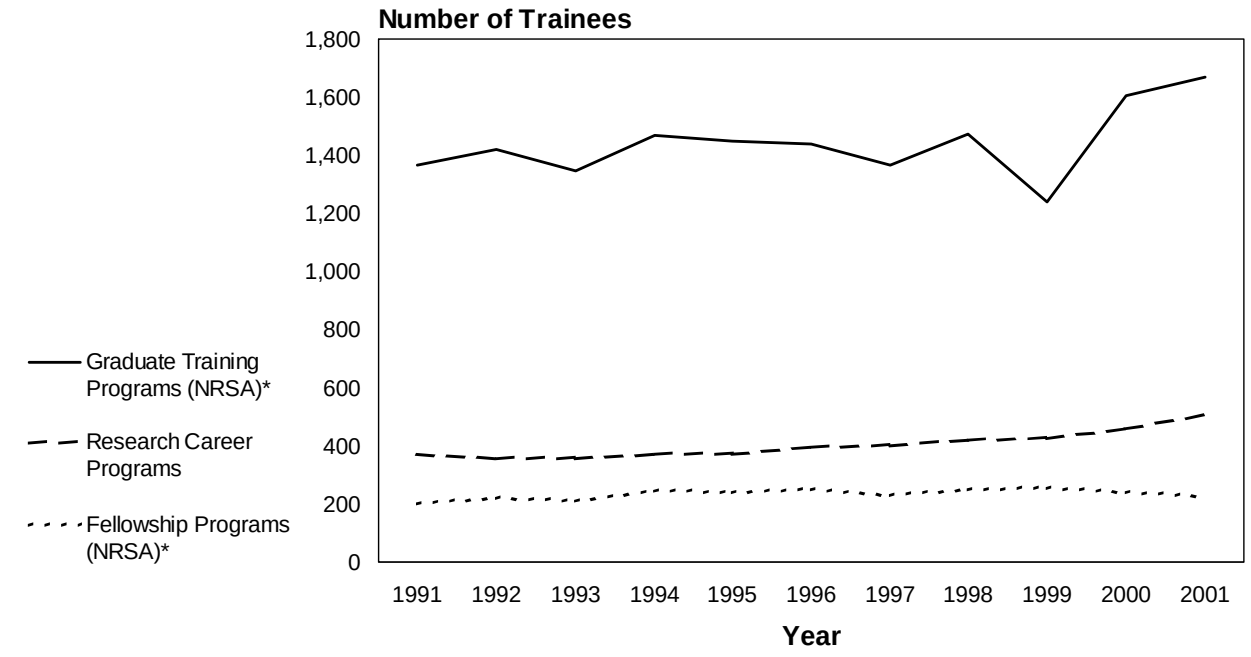
Coronary heart disease, cancer, and osteoporosis are the most common causes of death, disability, and impaired quality of life in postmenopausal women. The WHI (see Chapters 2 and 11) seeks to answer questions on benefits and risks of HRT, changes in dietary patterns, and calcium/vitamin D supplements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

13. Research Training and Career Development Programs

NHLBI Research Training and Career Development Obligations: Fiscal Years 1991-2001



NHLBI Full-Time Training Positions: Fiscal Years 1991-2001



* National Research Service Awards (NRSA).

† 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 NRSA.

Note: Numbers of awards and trainees may not agree with other tables due to the method of counting supplements.

Training Awards, Full-Time Training Positions, and Obligations by Activity: Fiscal Year 2001

	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)	12	12	$ 263,845	$ —	$ 263,845	0.4%
Individual NRSA (F32)	208	208	8,515,307	—	8,515,307	11.8
Senior Fellowships NRSA (F33)	3	3	147,236	—	147,236	0.2
Minority Access to Research Careers (MARC) Fellowships NRSA (F34)	—	—	—	—	—	—
Intramural NRSA (F35)	—	—	—	—	—	—
Subtotal, Fellowships	223	223	8,926,388	—	8,926,388	12.3
Graduate Training Programs						
Institutional NRSA (T32)	203	1,425	54,349,062	4,167,910	58,516,972	80.9
Minority Institutional NRSA (T32)	6	43	920,050	75,950	996,000	1.4
Off-Quarter Professional Student Training NRSA (T34, T35)	21	109	1,830,508	143,593	1,974,101	2.7
Minority Access to Research Careers (MARC) (T36)	—	—	5,000	—	5,000	0.0
Short-Term Training for Minority Students (T35M)	30	93	1,738,409	138,129	1,876,538	2.6
Subtotal, Training Grants	260	1,670	58,843,029	4,525,582	63,368,611*	87.7
Total, Training Programs	**483**	**1,893**	**$67,769,417**	**$4,525,582**	**$72,294,999***	**100%**

* Excludes assessment of $1,424,000.

History of Training Obligations by Activity: Fiscal Years 1991-2001

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Fellowship Programs											
Predoctoral Fellowship Award for Minority Student (F31)	$ —	$ 55	$ 97	$ 199	$ 304	$ 551	$ 388	$ 466	$ 346	$ 248	$ 264
Individual NRSA (F32)	5,554	6,041	5,867	6,853	6,651	6,483	6,281	6,969	8,807	8,517	8,515
Senior Fellowships NRSA (F33)	205	141	141	99	99	233	179	125	90	92	147
Intramural NRSA (F35)	133	146	70	69	49	—	—	—	—	0	0
Subtotal, Fellowships	5,892	6,383	6,175	7,220	7,103	7,267	6,848	7,560	9,243	8,857	8,926
Graduate Training Programs											
Institutional NRSA (T32)	37,533[A]	37,355[B]	34,846[C]	36,534[D]	36,270[E]	36,718[F]	38,253[G]	37,904[H]	45,551[I]	50,507[J]	58,516[K]
Minority Institutional NRSA (T32)	432	684	35	735	982	679	898	706	901	11,67	996
Off-Quarter Professional Student Training NRSA (T34, T35)	1,150	1,106	1,744	1,132	951	1,001	1,216	1,435	1,384	966	1,974
Minority Access to Research Careers (MARC) (T36)	19	22	15	5	5	5	5	5	5	5	5
Short-Term Training for Minority Students (T35M)	339	717	573	1,616	1,760	1,834	1,612	1,964	2,494	2,570	1,877
Subtotal, Training Grants	39,473	39,884	37,213	40,022	39,968	40,237	41,984	42,014	50,335	55,215	63,368
Total, Training Programs	**$45,365[A]**	**$46,267[B]**	**$43,388[C]**	**$47,242[D]**	**$47,071[E]**	**$47,504[F]**	**$48,832[G]**	**$49,574[H]**	**$59,578[I]**	**$64,072[J]**	**$72,294[K]**

A Excludes Assessment of $405,800.
B Excludes Assessment of $466,000.
C Excludes Assessment of $888,000.
D Excludes Assessment of $864,000.
E Excludes Assessment of $964,000.
F Excludes Assessment of $982,000.
G Excludes Assessment of $1,004,000.
H Excludes Assessment of $1,032,000.
I Excludes Assessment of $1,216,000.
J Excludes Assessment of $1,280,000.
K Excludes Assessment of $1,424,000.

Full-Time Training Positions by Activity: Fiscal Years 1991-2001

	Number of Positions										
	Fiscal Year										
	1991	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Fellowship Programs											
Predoctoral Fellowship Award for Minority Students (F31)	—	3	4	7	13	21	15	19	13	11	12
Individual NRSA (F32)	191	209	200	229	222	220	210	225	237	225	208
Senior Fellowships NRSA (F33)	6	4	4	4	4	7	5	4	2	2	3
Minority Access to Research Careers (MARC) Fellowships NRSA (F34)	—	—	—	—	—	—	—	—	—	—	—
Intramural NRSA (F35)	4	5	3	2	2	—	—	—	—	—	—
Subtotal, Fellowships	201	221	211	242	241	248	230	248	252	238	223
Graduate Training Programs											
Institutional NRSA (T32)	1,218	1,240	1,124	1,237	1,201	1,216	1,179	1,423	1,185	1368	1,425
Minority Institutional NRSA (T32)	19	24	1	30	47	30	43	52	53	48	43
Off-Quarter Professional Student Training NRSA (T34, T35)	103	102	181	100	76	78	68	—	—	51	109
Minority Access to Research Careers (MARC) (T36)	—	—	—	—	—	—	—	—	—	—	—
Short-Term Training for Minority Students (T35M)	26	53	40	102	125	113	75	—	—	136	93
Subtotal, Training Grants	1,366	1,419	1,346	1,469	1,449	1,437	1,365	1,475	1,238	1,603	1,670
Total, Training Positions	**1,567**	**1,640**	**1,557**	**1,711**	**1,690**	**1,685**	**1,595**	**1,723**	**1,490**	**1,841**	**1,893**

NHLBI Research Career Programs: Fiscal Years 1991-2001

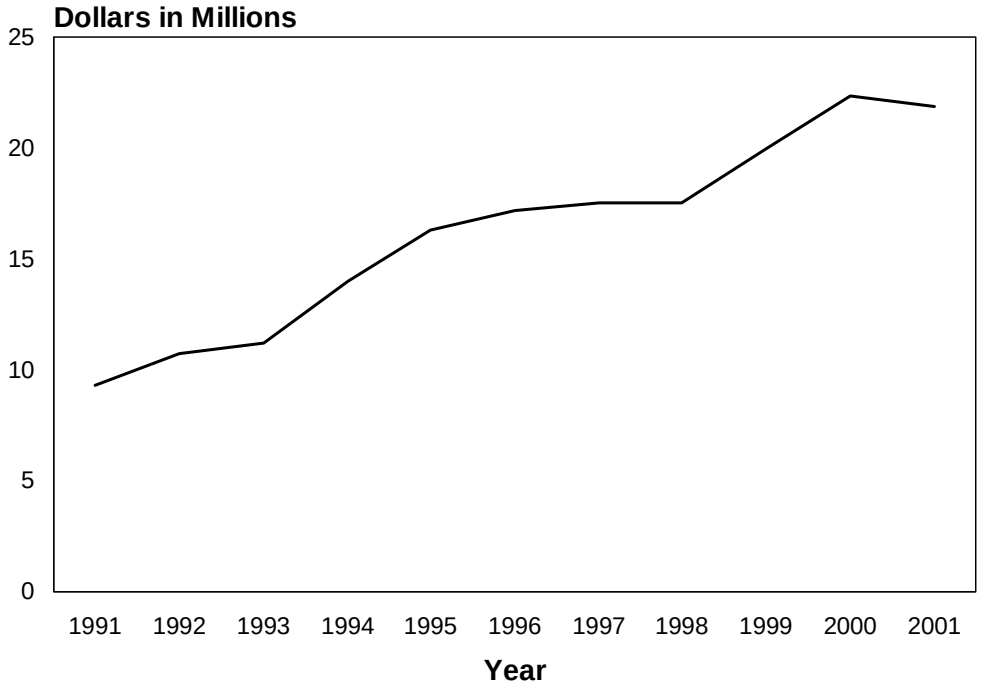
	Number of Awards										
	Fiscal Year										
	1991	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Mentored Research Scientist Development Award for Minority Faculty (K01)	—	—	—	—	—	—	5	19	30	29	44
Minority Institution Faculty Mentored Research Scientist Award (K01)	—	—	—	—	—	—	1	—	—	11	9
Independent Scientist Award (K02)	—	—	—	—	—	3	8	14	18	27	34
Research Career Development Award (K04)	65	50	40	34	30	25	18	10	6	1	—
Research Career Award (K06)	8	7	6	3	3	3	3	3	2	2	2
Preventive Cardiology Academic Award (K07)	23	18	14	11	7	—	—	—	—		—
Preventive Pulmonary Academic Award (K07)	20	14	11	8	4	—	—	—	—		—
Transfusion Medicine Academic Award (K07)	18	14	12	9	5	2	—	—	—		—
Systemic Pulmonary and Vascular Disease Academic Award (K07)	2	6	11	11	15	11	9	3	3	1	—
Asthma Academic Award (K07)	—	—	3	6	9	9	9	6	3		—
Tuberculosis Academic Award (K07)	—	—	6	12	15	19	23	20	13	9	5
Sleep Academic Award (K07)	—	—	—	—	—	8	12	20	20	20	12
Nutrition Academic Award (K07)	—	—	—	—	—	—	—	10	10	19	19
Clinical Investigator Award (K08)	137	152	180	208	222	254	267	278	262	257	241
Physician Scientist Award (K11)	82	79	60	46	22	12	—	—	—		—
Minority School Faculty Development Award (K14)	18	18	15	12	11	15	9	—	—	4	1
Research Development Award for Minority Faculty (K14)	—	—	—	13	28	36	34	37	22	7	—
Mentored Patient-Oriented Research Career Development Award (K23)	—	—	—	—	—	—	—	—	13	36	58
Mid-Career Investigator Award in Patient-Oriented Research (K24)	—	—	—	—	—	—	—	—	11	20	27
Mentored Quantitative Research Career Development Award (K25)	—	—	—	—	—	—	—	—	—	—	2
Clinical Research Curriculum Award (K30)	—	—	—	—	—	—	—	—	9	16	55
Total, Research Career Programs	**373**	**358**	**358**	**373**	**371**	**397**	**398**	**420**	**422**	**459**	**509**

NHLBI Research Career Program Obligations: Fiscal Years 1991-2001

Dollars (Thousands)

	Fiscal Year										
	1991	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Mentored Research Scientist Development Award for Minority Faculty (K01)	$ —	$ —	$ —	$ —	$ —	$ —	$ 460	$ 1,824	$ 3,644	$ 3,650	$ 5,556
Minority Institution Faculty Mentored Research Scientist Award (K01)	—	—	—	—	—	—	106	—	—	1,300	1,143
Independent Scientist Award (K02)	—	—	—	—	—	207	545	933	1,548	2,350	3,202
Research Career Development Award (K04)	4,279	3,221	2,595	2,224	2,006	1,693	1,226	684	568	69	—
Research Career Award (K06)	270	239	194	102	104	105	103	103	70	70	70
Preventive Cardiology Academic Award (K07)	2,921	2,376	1,801	1,397	957	—	—	—	—		—
Preventive Pulmonary Academic Award (K07)	1,851	1,332	1,040	726	309	—	—	—	—		—
Transfusion Medicine Academic Award (K07)	1,658	1,452	1,155	868	485	326	—	—	—		—
Systemic Pulmonary and Vascular Diseases Academic Award (K07)	242	894	1,820	1,863	2,295	1,715	1,415	386	423	113	—
Asthma Academic Award (K07)	—	—	233	502	749	740	764	509	248		—
Tuberculosis Academic Award (K07)	—	—	454	906	1,155	1,496	1,831	1,566	1,161	745	396
Sleep Academic Award (K07)	—	—	—	—	—	699	1,027	1,734	1,736	1,760	1,081
Nutrition Academic Award (K07)	—	—	—	—	—	—	—	1,491	1,480	2,829	2,869
Clinical Investigator Award (K08)	10,370	11,733	14,125	16,635	18,090	21,093	22,238	23,122	29,741	30,189	29,263
Physician Scientist Award (K11)	6,651	6,598	5,110	3,993	1,903	1,023	—	—	—		—
Minority School Faculty Development Award (K14)	1,226	1,265	1,081	893	810	1,158	729	618	—	862	98
Research Development Award for Minority Faculty (K14)	—	—	—	1,289	2,812	3,607	3,468	3,099	2,538	393	—
Mentored Patient-Oriented Research Career Development Award (K23)	—	—	—	—	—	—	—	—	1,687	4,619	7,570
Mid-Career Investigator Award in Patient-Oriented Research (K24)	—	—	—	—	—	—	—	—	1,054	2,072	2,877
Mentored Quantitative Research Career Development Award (K25)	—	—	—	—	—	—	—	—	—	—	272
Clinical Research Curriculum Award (K30)	—	—	—	—	—	—	—	—	1,772	3,163	3,073
Total, Research Career Program Obligations	**$29,468**	**$29,110**	**$29,608**	**$31,398**	**$31,675**	**$33,862**	**$33,912**	**$36,069**	**$47,670**	**$54,184**	**$57,470**

NHLBI Minority Biomedical Research Training, Career Development, and Research Supplements Program Obligations: Fiscal Years 1991-2001



NHLBI Minority Biomedical Research Training, Career Development, and Research Supplements Program Obligations: Fiscal Years 1991-2001

	Dollars (Thousands)										
	Fiscal Year										
	1991	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
MARC Summer Research Training Program	$ 32	$ 20	$ 48	$ 31	$ 28	$ 32	$ 17	$ —	$ 10	$ 3,873	$ 20
Mentored Research Scientist Development Award for Minority Faculty	—	—	—	—	—	—	460	376	2,738	3,650	5,556
Minority Access to Research Careers (MARC)	—	—	—	—	—	5	5	5	—	5	5
Minority Biomedical Research Support (MBRS)	2,561	2,672	2,540	2,433	2,313	2,503	2,722	2,978	3,423	3,873	3,165
Minority Institution Faculty Mentored Research Scientist Award	—	—	—	—	—	—	106	101	905	1,300	1,143
Minority Institution Research Training Program	567	684	608	735	982	679	898	706	901	1,167	996
Minority Predoctoral Fellowship	—	55	114	199	304	551	388	436	345	248	264
Minority Research Supplements Program	4,596	5,367	6,273	6,754	7,264	6,714	7,021	7,043	6,518	8,128	8,491
Minority School Faculty Development Award	1,226	1,265	1,081	893	810	1,158	729	618	445	862	98
Reentry Supplements	—	—	—	—	—	140	89	249	106	176	301
Research Development Award for Minority Faculty	—	—	—	1,289	2,812	3,607	3,468	3,099	2,083	393	—
Short-Term Training for Minority Students	339	717	573	1,616	1,760	1,834	1,612	1,964	2,494	2,570	1,876
Total, Minority Programs	**$9,321**	**$10,780**	**$11,237**	**$13,950**	**$16,273**	**$17,223**	**$17,515**	**$17,575**	**$19,968**	**$22,372**	**$21,915**

NHLBI Research Supplements Program for Underrepresented Minorities by Award Type: Fiscal Years 1991-2001

Number of Awards

	Fiscal Year										
	1991	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Investigator	54	45	51	46	49	42	38	31	32	33	33
Postdoctoral	9	25	29	31	39	49	47	50	47	42	41
Graduate	24	37	45	55	42	37	36	48	53	47	43
Undergraduate	16	22	20	35	27	12	23	25	17	19	12
High School	2	1	5	15	10	8	9	11	6	—	3
Reentry Supplements	—	—	—	—	—	2	2	3	2	1	3
Total, Research Supplements Program	**105**	**130**	**150**	**182**	**167**	**150**	**155**	**168**	**157**	**142**	**135**

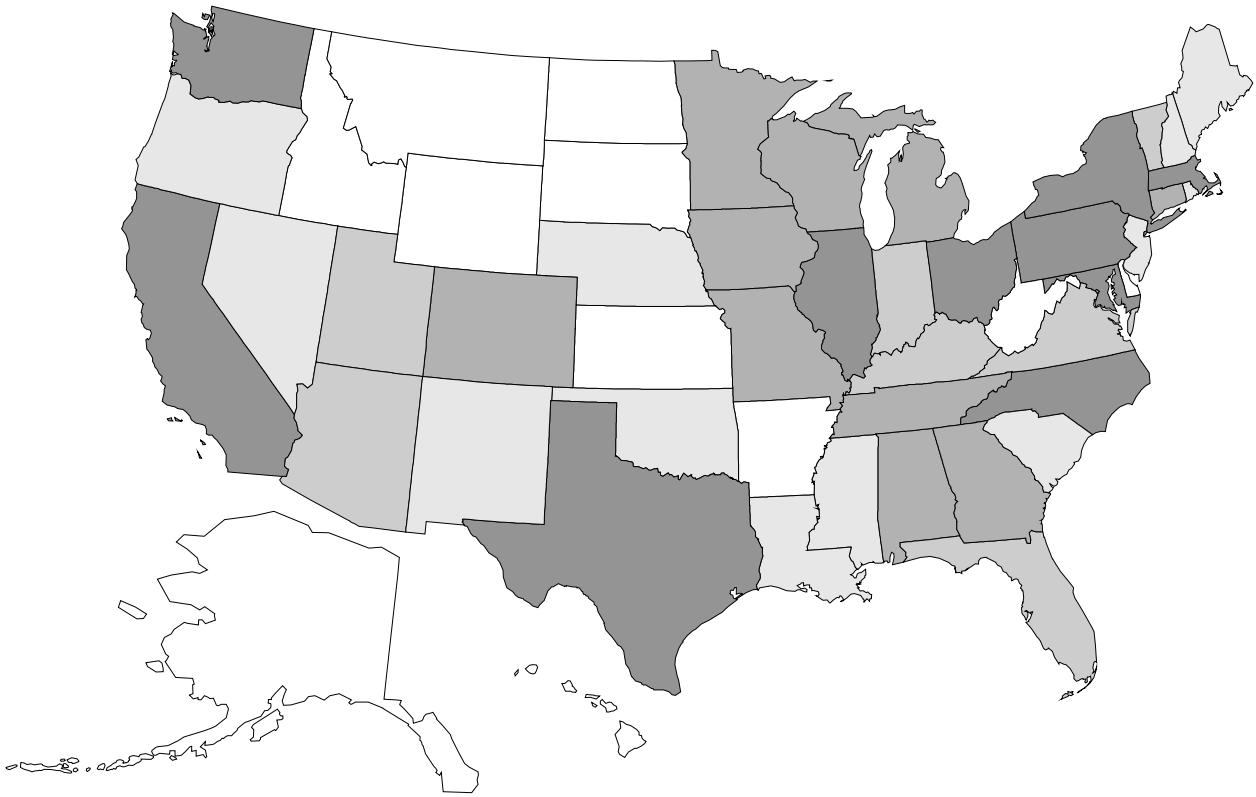
NHLBI Research Supplements Program Obligations for Underrepresented Minorities by Award Type: Fiscal Years 1991-2001

Dollars in Thousands

	Fiscal Year										
	1991	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Investigator	$3,449	$2,959	$3,270	$2,894	$3,319	$2,552	$2,412	$2,185	$2,331	$3,262	$3,430
Postdoctoral	478	1,392	1,574	1,882	2,153	2,899	3,172	3,032	3,110	3,053	3,086
Graduate	501	843	1,263	1,585	1,402	1,116	1,181	1,527	1,806	1,791	1,818
Undergraduate	162	171	150	332	351	120	273	246	166	198	235
High School	6	3	16	61	40	27	32	53	27	—	18
Reentry Supplements	—	—	—	—	—	140	152	249	106	176	384
Total, Research Supplements Program	**$4,596**	**$5,368**	**$6,273**	**$6,754**	**$7,265**	**$6,854**	**$7,222**	**$7,292**	**$7,546**	**$8,480**	**$8,971**

14. Geographic Distribution of Awards: Fiscal Year 2001

Geographic Distribution of Awards by State: Fiscal Year 2001



Geographic Distribution of Awards by State or Country: Fiscal Year 2001

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Alabama								
Auburn University at Auburn	5	$ 1,423,707	5	$ 1,423,707	—	$ —	—	$ —
Diversified Scientific, Inc.	1	406,673	1	406,673	—	—	—	—
Tuskegee University	1	27,780	1	24,000	—	3,780	—	—
University of Alabama at Birmingham	84	29,062,682	71	22,753,977	7	852,212	6	5,456,493
University of South Alabama	14	5,406,786	14	5,406,786	—	—	—	—
Total Alabama	**105**	**36,327,628**	**92**	**30,015,143**	**7**	**855,992**	**6**	**5,456,493**
Arizona								
Arete Associates	1	86,775	1	86,775	—	—	—	—
Arizona State University	3	597,942	3	597,942	—	—	—	—
Nanosignal, LLC	1	104,612	1	104,612	—	—	—	—
Carl T. Hayden Veterans Medical Center	1	225,000	1	225,000	—	—	—	—
University of Arizona	42	14,832,663	36	13,164,208	5	491,221	1	1,177,234
Total Arizona	**48**	**15,846,992**	**42**	**14,178,537**	**5**	**491,221**	**1**	**1,177,234**
Arkansas								
Arkansas Children's Hospital Research Institute	2	475,851	2	475,851	—	—	—	—
University of Arkansas at Pine Bluff	1	78,288	1	78,288	—	—	—	—
University of Arkansas for Medical Sciences, Little Rock	5	1,209,304	5	1,209,304	—	—	—	—
Total Arkansas	**8**	**1,763,443**	**8**	**1,763,443**	**—**	**—**	**—**	**—**
California								
Adelphi Technology	1	99,292	1	99,292	—	—	—	—
Advanced Brain Monitoring, Inc.	2	225,300	2	225,300	—	—	—	—
American National Red Cross, Los Angeles	1	727,290	—	—	—	—	1	727,290
Anticancer Inc.	1	463,300	1	463,300	—	—	—	—
Berkeley Applied Science and Engineering, Inc.	2	831,715	2	831,715	—	—	—	—
Blaufuss Multimedia	1	372,611	1	372,611	—	—	—	—
Burnham Institute	3	1,193,792	3	1,193,792	—	—	—	—
California Institute of Technology	3	615,736	2	571,964	1	43,772	—	—
CardioMend LLC	1	391,369	1	391,369	—	—	—	—
Cedars-Sinai Medical Center	7	2,336,035	6	2,046,878	—	—	1	289,157
Cerus Corporation	1	258,000	1	258,000	—	—	—	—
Charles R. Drew University of Medicine and Science	1	60,772	—	—	1	60,772	—	—
Children's Hospital Los Angeles	6	4,104,209	6	4,104,209	—	—	—	—
Children's Hospital Oakland	12	4,659,656	10	4,446,622	2	213,034	—	—
Children's Hospital of Orange County	1	292,000	1	292,000	—	—	—	—
Chimeric Technologies	1	134,820	1	134,820	—	—	—	—
City of Hope National Medical Center	1	405,000	1	405,000	—	—	—	—
Clarigen, Inc.	1	101,052	1	101,052	—	—	—	—
COR Therapeutics, Inc.	2	653,599	2	653,599	—	—	—	—
Cytokinetics Inc.	2	199,800	2	199,800	—	—	—	—
FFA Sciences LLC	1	100,000	1	100,000	—	—	—	—
Gen-Probe, Inc.	1	3,100,140	—	—	—	—	1	3,100,140
GenStar Therapeutics	1	375,000	1	375,000	—	—	—	—
Good Samaritan Hospital	1	265,750	1	265,750	—	—	—	—
Harbor-UCLA Research and Education Institute	12	3,892,387	9	2,357,463	—	—	3	1,534,924

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Hemosaga Diagnostics Corporation	1	143,433	1	143,433	—	—	—	—
Ichor Medical Systems, Inc.	1	301,531	1	301,531	—	—	—	—
Institute of Critical Care Medicine	1	176,811	1	176,811	—	—	—	—
Intelligent Optical Systems, Inc.	1	99,996	1	99,996	—	—	—	—
J. David Gladstone Institutes	15	8,930,065	14	8,886,293	1	43,772	—	—
Jaycor	1	339,532	1	339,532	—	—	—	—
Kaiser Foundation Hospitals	1	465,857	1	465,857	—	—	—	—
Kaiser Foundation Research Institute	7	6,594,689	3	2,243,380	—	—	4	4,351,309
La Jolla Institute for Experimental Medicine	3	1,077,248	3	1,077,248	—	—	—	—
Life Measurement Instrument	1	286,018	1	286,018	—	—	—	—
Loma Linda University	6	1,628,879	6	1,628,879	—	—	—	—
Magnesensors, Inc.	1	476,433	1	476,433	—	—	—	—
Mallard Medical, Inc.	1	249,830	1	249,830	—	—	—	—
Microislet Inc.	1	99,347	1	99,347	—	—	—	—
Northern California Institute for Research and Education	7	1,404,425	7	1,404,425	—	—	—	—
Novasite Pharmaceuticals, Inc.	—	77,251	—	77,251	—	—	—	—
Oncosis Inc.	—	1,537,963	—	1,537,963	—	—	—	—
Optical Biopsy Technologies Inc.	1	154,581	1	154,581	—	—	—	—
Palo Alto Institute for Research and Education	2	375,828	2	375,828	—	—	—	—
Palo Alto Medical Foundation Research Institute	1	598,315	1	598,315	—	—	—	—
PharmaSonics, Inc.	2	929,500	2	929,500	—	—	—	—
Photon Imaging, Inc.	1	100,000	1	100,000	—	—	—	—
Polymer Technology Group Inc.	1	413,273	1	413,273	—	—	—	—
Precision Haemostatics, Inc.	1	224,828	1	224,828	—	—	—	—
SACNAS	—	5,000	—	—	—	5,000	—	—
Salk Institute for Biological Studies	2	930,916	2	930,916	—	—	—	—
SAM Technology, Inc.	1	99,856	1	99,856	—	—	—	—
San Diego State University	6	2,406,240	6	2,406,240	—	—	—	—
Sangart, Inc.	2	813,720	2	813,720	—	—	—	—
Scripps Research Institute	48	22,053,251	44	21,319,633	4	733,618	—	—
Seashell Technology LLC	1	100,000	1	100,000	—	—	—	—
Sidney Kimmel Cancer Center	3	1,298,610	3	1,298,610	—	—	—	—
SRI International	1	784,277	1	784,277	—	—	—	—
Stanford University	69	25,568,181	57	21,786,062	10	1,024,242	2	2,757,877
Synzyme Technology, Inc.	1	100,044	1	100,044	—	—	—	—
Torrey Pines Institute for Molecular Studies	1	279,741	1	279,741	—	—	—	—
University of California, Lawrence Berkeley National Laboratory	18	11,895,418	17	11,705,373	1	190,045	—	—
University of California, Berkeley	8	2,449,613	6	2,198,975	2	250,638	—	—
University of California, Davis	31	9,303,691	27	7,409,176	2	156,137	2	1,738,378
University of California, Irvine	14	5,927,744	12	3,014,326	—	—	2	2,913,418
University of California, Los Angeles	60	28,235,789	53	24,600,425	3	417,344	4	3,218,020
University of California, Riverside	4	1,122,840	4	1,122,840	—	—	—	—
University of California, San Diego	87	44,648,032	73	40,376,973	12	2,511,292	2	1,759,767
University of California, San Francisco	97	37,630,157	85	35,718,520	11	1,114,509	1	797,128
University of California, Santa Barbara	3	504,236	2	462,240	1	41,996	—	—
University of Southern California	21	7,470,052	21	7,470,052	—	—	—	—
Veterans Medical Research Foundation, San Diego	1	214,888	1	214,888	—	—	—	—
Total California	**602**	**256,386,554**	**528**	**226,392,975**	**51**	**6,806,171**	**23**	**23,187,408**

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Colorado								
Aerophase Corporation	1	100,000	1	100,000	—	—	—	—
Colorado State University	4	710,574	3	666,478	1	44,096	—	—
Keystone Symposia	1	10,000	1	10,000	—	—	—	—
National Jewish Medical and Research Center	41	16,977,317	37	16,579,573	3	125,952	1	271,792
University of Colorado at Boulder	8	1,285,316	4	1,059,088	4	226,228	—	—
University of Colorado Health Sciences Center	51	17,071,221	47	16,251,782	4	819,439	—	—
Total Colorado	**106**	**36,154,428**	**93**	**34,666,921**	**12**	**1,215,715**	**1**	**271,792**
Connecticut								
Fairfield University	1	39,232	—	—	1	39,232	—	—
Hartford Hospital	1	262,068	—	—	—	—	1	262,068
John B. Pierce Laboratory, Inc.	5	1,279,260	4	1,246,000	1	33,260	—	—
MGS Research Inc.	1	588,244	1	588,244	—	—	—	—
Sib Tech, Inc.	1	376,011	1	376,011	—	—	—	—
University of Connecticut School of Medicine and Dentistry	11	2,971,997	11	2,971,997	—	—	—	—
University of Connecticut, Storrs	2	226,172	1	178,750	1	47,422	—	—
Yale University	62	22,669,435	53	21,334,811	8	1,240,784	1	93,840
Total Connecticut	**84**	**28,412,419**	**71**	**26,695,813**	**11**	**1,360,698**	**2**	**355,908**
Delaware								
Compact Membrane Systems, Inc.	1	110,000	1	110,000	—	—	—	—
University of Delaware	4	830,156	4	830,156	—	—	—	—
Total Delaware	**5**	**940,156**	**5**	**940,156**	**—**	**—**	**—**	**—**
District of Columbia								
American National Red Cross	17	6,505,266	16	5,688,241	—	—	1	817,025
American Registry of Pathology, Inc.	1	180,000	1	180,000	—	—	—	—
Children's National Medical Center	1	417,736	1	417,736	—	—	—	—
Children's Research Institute	3	1,302,376	2	1,256,885	—	—	1	45,491
George Washington University	11	4,322,163	9	3,032,919	—	—	2	1,289,244
Georgetown University	21	7,160,754	19	7,073,039	2	87,715	—	—
Howard University	4	1,620,966	2	813,897	—	—	2	807,069
Medlantic Research Institute	1	55,736	—	—	—	—	1	55,736
Medstar Research Institute	4	4,937,525	3	3,727,660	—	—	1	1,209,865
Smithsonian Institution	—	50,000	—	50,000	—	—	—	—
State of the Art, Inc.	1	125,635	1	125,635	—	—	—	—
U.S. Department of Veterans Affairs Medical Center	1	73,337	—	—	—	—	1	73,337
University of the District of Columbia	—	4,104	—	—	—	4,104	—	—
Total District of Columbia	**65**	**26,755,598**	**54**	**22,366,012**	**2**	**91,819**	**9**	**4,297,767**
Florida								
Alpha-1 Foundation	1	10,000	1	10,000	—	—	—	—
Applied Genetic Technologies Corporation	1	256,725	1	256,725	—	—	—	—
AquaGene, LLC	1	98,016	1	98,016	—	—	—	—
Florida Agricultural and Mechanical University	—	433,394	—	433,394	—	—	—	—
Florida Atlantic University	2	688,017	2	688,017	—	—	—	—
Florida International University	—	168,863	—	168,863	—	—	—	—
Nanoptics, Inc.	1	330,158	1	330,158	—	—	—	—
University of Florida	32	10,457,752	30	9,083,606	1	74,208	1	1,299,938

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
University of Miami	14	4,037,532	11	2,789,811	1	351,319	2	896,402
University of Miami, Coral Gables	3	2,354,428	1	1,940,307	1	267,166	1	146,955
University of South Florida	7	1,345,542	7	1,345,542	—	—	—	—
Total Florida	**62**	**20,180,427**	**55**	**17,144,439**	**3**	**692,693**	**4**	**2,343,295**
Georgia								
Atlanta Cardiovascular Research Institute	1	213,474	1	213,474	—	—	—	—
Clark Atlanta University	1	126,435	1	122,655	—	3,780	—	—
Cryofacets, Inc.	1	175,323	1	175,323	—	—	—	—
CryoLife, Inc.	1	434,708	1	434,708	—	—	—	—
Emory University	62	17,856,156	56	16,562,172	5	488,825	1	805,159
Georgia Institute of Technology	2	590,681	2	590,681	—	—	—	—
Georgia State University	1	247,390	1	247,390	—	—	—	—
Medical College of Georgia	25	9,984,467	24	9,861,405	1	123,062	—	—
Mercer University, Macon	1	154,620	1	154,620	—	—	—	—
Morehouse School of Medicine	5	2,735,164	4	2,669,062	1	66,102	—	—
Savannah State College	1	98,119	1	98,119	—	—	—	—
Transfusion and Transplantation Technology	1	99,976	1	99,976	—	—	—	—
U.S. Centers for Disease Control and Prevention	2	745,000	—	—	—	—	2	745,000
University of Georgia	2	341,529	2	341,529	—	—	—	—
Total Georgia	**106**	**33,803,042**	**96**	**31,571,114**	**7**	**681,769**	**3**	**1,550,159**
Hawaii								
Kuakini Medical Center	1	275,880	1	275,880	—	—	—	—
Pacific Health Research Institute	1	1,149,542	1	1,149,542	—	—	—	—
University of Hawaii at Hilo	—	290,473	—	290,473	—	—	—	—
University of Hawaii at Manoa	1	1,312,933	—	—	—	—	1	1,312,933
Total Hawaii	**3**	**3,028,828**	**2**	**1,715,895**	**—**	**—**	**1**	**1,312,933**
Illinois								
American Academy of Pediatrics	1	304,864	1	304,864	—	—	—	—
Biomedical Acoustics Research Company	1	396,479	1	396,479	—	—	—	—
BioTechPlex Corporation	3	927,630	3	927,630	—	—	—	—
Children's Memorial Hospital (Chicago)	1	98,010	1	98,010	—	—	—	—
Evanston Northwestern Healthcare Research Institute	4	1,126,427	4	1,126,427	—	—	—	—
Finch University of Health Sciences, Chicago Medical School	1	284,000	1	284,000	—	—	—	—
Haemoscope Corporation	1	391,500	1	391,500	—	—	—	—
Illinois Institute of Technology	2	1,066,219	2	1,066,219	—	—	—	—
Life Resuscitation Technologies, Inc.	—	42,911	—	42,911	—	—	—	—
Loyola University Medical Center	24	6,579,411	21	6,462,387	3	117,024	—	—
Northwestern University, Evanston	8	2,138,785	7	1,878,111	1	260,674	—	—
Northwestern University, Chicago	41	11,199,542	36	8,672,101	2	94,972	3	2,432,469
Organ Recovery Systems, Inc.	1	100,000	1	100,000	—	—	—	—
Rush-Presbyterian-St. Luke's Medical Center	12	4,241,851	10	3,086,911	—	—	2	1,154,940
Southern Illinois University Carbondale	1	300,440	1	300,440	—	—	—	—
Southern Illinois University School of Medicine	1	144,149	1	144,149	—	—	—	—
U.S. Department of Veterans Affairs Medical Center, Hines	1	155,693	1	155,693	—	—	—	—
University of Chicago	42	12,647,591	32	10,377,899	9	1,949,977	1	319,715

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
University of Illinois at Chicago	44	15,549,611	38	14,503,887	6	1,045,724	—	—
University of Illinois at Urbana-Champaign	8	2,727,529	8	2,727,529	—	—	—	—
Total Illinois	**197**	**60,422,642**	**170**	**53,047,147**	**21**	**3,468,371**	**6**	**3,907,124**
Indiana								
Indiana University Purdue University at Indianapolis	47	14,232,433	42	13,073,481	5	1,158,952	—	—
Indiana University, Bloomington	1	38,758	1	38,758	—	—	—	—
Methodist Research Institute	1	207,435	1	207,435	—	—	—	—
Purdue University, West Lafayette	3	912,944	3	912,944	—	—	—	—
University of Notre Dame	5	1,770,693	5	1,770,693	—	—	—	—
Total Indiana	**57**	**17,162,263**	**52**	**16,003,311**	**5**	**1,158,952**	**—**	**—**
Iowa								
Iowa State University of Science and Technology	1	179,201	1	179,201	—	—	—	—
Maharishi University of Management	3	1,201,840	3	1,201,840	—	—	—	—
Medical Imaging Applications	1	363,598	1	363,598	—	—	—	—
University of Iowa	80	33,799,292	70	30,482,799	9	2,150,994	1	1,165,499
Total Iowa	**85**	**35,543,931**	**75**	**32,227,438**	**9**	**2,150,994**	**1**	**1,165,499**
Kansas								
Kansas State University	5	758,682	4	725,422	1	33,260	—	—
ProQuest Pharmaceuticals, Inc.	1	99,921	1	99,921	—	—	—	—
University of Kansas, Lawrence	4	1,103,041	3	1,069,209	1	33,832	—	—
University of Kansas Medical Center	5	1,030,825	4	995,993	1	34,832	—	—
Wichita State University	1	135,820	1	135,820	—	—	—	—
Total Kansas	**16**	**3,128,289**	**13**	**3,026,365**	**3**	**101,924**	**—**	**—**
Kentucky								
InfraReDx, Inc.	1	436,600	1	436,600	—	—	—	—
University of Kentucky	31	6,860,449	28	6,748,828	3	111,621	—	—
University of Louisville	28	6,913,596	27	6,878,129	1	35,467	—	—
Total Kentucky	**60**	**14,210,645**	**56**	**14,063,557**	**4**	**147,088**	**—**	**—**
Louisiana								
Louisiana State University Health Sciences Center, New Orleans	7	1,509,225	6	1,279,143	—	—	1	230,082
Louisiana State University Health Sciences Center, Shreveport	4	962,131	4	962,131	—	—	—	—
Louisiana State University Pennington Biomedical Research Center	2	1,068,407	2	1,068,407	—	—	—	—
Tulane University of Louisiana	17	4,631,000	16	4,612,000	1	19,000	—	—
Xavier University of Louisiana	—	102,125	—	102,125	—	—	—	—
Total Louisiana	**30**	**8,272,888**	**28**	**8,023,806**	**1**	**19,000**	**1**	**230,082**
Maine								
Jackson Laboratory	9	6,520,030	8	6,478,034	1	41,996	—	—
Maine Medical Center	2	580,800	2	580,800	—	—	—	—
University of Maine, Orono	1	443,594	1	443,594	—	—	—	—
University of New England	1	377,879	1	377,879	—	—	—	—
Total Maine	**13**	**7,922,303**	**12**	**7,880,307**	**1**	**41,996**	**—**	**—**

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Maryland								
American Physiological Society	1	15,000	1	15,000	—	—	—	—
Amulet Pharmaceuticals, Inc.	1	472,075	1	472,075	—	—	—	—
Baltimore BioMedical Inc.	1	148,854	1	148,854	—	—	—	—
BBT Biotech Research Laboratories, Inc.	1	440,000	—	—	—	—	1	440,000
BioArray Technologies, Inc.	1	143,121	1	143,121	—	—	—	—
BioSeq, Inc.	1	371,188	1	371,188	—	—	—	—
Claragen, Inc.	1	99,965	1	99,965	—	—	—	—
Clearant, Inc.	1	98,173	1	98,173	—	—	—	—
Compact Disc, Inc.	2	200,000	2	200,000	—	—	—	—
EMMES Corporation	2	1,585,065	—	—	—	—	2	1,585,065
Federation of American Societies for Experimental Biology	2	40,000	2	40,000	—	—	—	—
Henry M. Jackson Foundation for the Advancement of Military Medicine	3	1,036,302	3	1,036,302	—	—	—	—
Individual Monitoring Systems Inc.	2	567,458	2	567,458	—	—	—	—
Infinite Biomedical Technologies, LLC	1	654,535	1	654,535	—	—	—	—
Institute for Genomic Research	2	2,147,160	2	2,147,160	—	—	—	—
Johns Hopkins University	163	63,131,995	139	53,890,547	15	3,198,598	9	6,042,850
Kennedy Krieger Research Institute, Inc.	1	264,174	1	264,174	—	—	—	—
Key Technologies, Inc.	1	587,831	1	587,831	—	—	—	—
Macro International Inc.	1	6,860	—	—	—	—	1	6,860
Maryland Medical Research Institute	2	810,679	2	810,679	—	—	—	—
Peace Technology, Inc.	1	1,761,889	—	—	—	—	1	1,761,889
Perinatronics Medical Systems, Inc.	1	543,929	1	543,929	—	—	—	—
Prospect Center of the American Institutes for Research	1	492,128	—	—	—	—	1	492,128
Quality Biological, Inc.	1	491,243	1	491,243	—	—	—	—
Robin Medical, Inc.	1	554,050	1	554,050	—	—	—	—
Science & Engineering Services, Inc.	1	99,764	1	99,764	—	—	—	—
Towson University	1	110,486	1	110,486	—	—	—	—
U.S. Agricultural Research Center	2	750,000	—	—	—	—	2	750,000
U.S. Census Bureau	1	487,000	—	—	—	—	1	487,000
U.S. Fogarty International Center	1	300,000	—	—	—	—	1	300,000
U.S. National Center for Complementary and Alternative Medicine	1	200,000	—	—	—	—	1	200,000
U.S. National Center for Health Statistics	3	420,000	—	—	—	—	3	420,000
U.S. National Center for Research Resources	—	356,000	—	—	—	—	—	356,000
U.S. National Heart, Lung, and Blood Institute	1	26,268,740	—	—	—	—	1	26,268,740
U.S. National Human Genome Research Institute	1	35,250,000	—	—	—	—	1	35,250,000
U.S. National Institute of Child Health and Human Development	1	48,412	—	—	1	48,412	—	—
U.S. National Institute of Diabetes and Digestive and Kidney Diseases	1	4,000,000	—	—	—	—	1	4,000,000
U.S. National Library of Medicine	1	189,954	—	—	—	—	1	189,954
U.S. Naval Medical Research Institute	1	115,200	—	—	—	—	1	115,200
U.S. PHS Indian Health Service Supply Service	2	33,350	—	—	—	—	2	33,350
U.S. PHS Public Advisory Groups	—	3,794,000	—	3,794,000	—	—	—	—
University of Maryland, Baltimore County Campus	2	562,896	2	562,896	—	—	—	—
University of Maryland Baltimore Professional School	25	7,218,559	24	6,993,601	—	—	1	224,958
University of Maryland Biotechnology Institute	4	1,350,878	4	1,350,878	—	—	—	—

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
University of Maryland Eastern Shore	—	8,208	—	—	—	8,208	—	—
Westat, Inc.	1	4,086,781	—	—	—	—	1	4,086,781
Total Maryland	**245**	**162,313,902**	**197**	**76,047,909**	**16**	**3,255,218**	**32**	**83,010,775**
Massachusetts								
ABIOMED, Inc.	2	1,818,290	1	361,042	—	—	1	1,457,248
ACell, Inc.	1	405,464	1	405,464	—	—	—	—
Baystate Medical Center	1	337,235	—	—	—	—	1	337,235
Beth Israel Deaconess Medical Center	58	22,256,093	52	21,137,362	6	1,118,731	—	—
Biomed Software, Inc.	1	100,168	1	100,168	—	—	—	—
Biomod Surfaces	1	99,994	1	99,994	—	—	—	—
Biophysics Assay Laboratory, Inc.	1	462,508	1	462,508	—	—	—	—
Boston Biomedical Research Institute	6	2,185,466	6	2,185,466	—	—	—	—
Boston Medical Center	12	5,094,430	12	5,094,430	—	—	—	—
Boston University	62	30,018,665	55	26,397,806	6	2,024,792	1	1,596,067
Brigham and Women's Hospital	135	54,783,760	108	48,713,492	24	3,605,365	3	2,464,903
CardioTech International, Inc.	1	249,782	1	249,782	—	—	—	—
Center for Blood Research	10	11,104,410	10	11,104,410	—	—	—	—
Children's Hospital Boston	49	16,501,463	42	15,127,748	7	1,373,715	—	—
Dana-Farber Cancer Institute	12	5,015,748	12	5,015,748	—	—	—	—
EIC Laboratories, Inc.	1	99,997	1	99,997	—	—	—	—
Exhale Therapeutics, Inc.	1	99,409	1	99,409	—	—	—	—
Foster-Miller, Inc.	1	749,970	1	749,970	—	—	—	—
Giner, Inc.	2	199,865	2	199,865	—	—	—	—
Gwathmey, Inc.	3	1,061,494	3	1,061,494	—	—	—	—
Harvard Pilgrim Health Care, Inc.	2	894,972	2	894,972	—	—	—	—
Harvard University	1	326,000	1	326,000	—	—	—	—
Harvard University Medical School	18	12,615,075	15	11,552,024	3	1,063,051	—	—
Harvard University School of Public Health	27	12,010,010	26	11,522,196	1	487,814	—	—
Hebrew Rehabilitation Center for Aged	2	293,945	1	253,749	1	40,196	—	—
Innovative Chemical/Environmental Technology	1	347,448	1	347,448	—	—	—	—
Inotek Corporation	3	657,305	3	657,305	—	—	—	—
Institute for Healthcare Improvement	—	200,000	—	200,000	—	—	—	—
IQuum, Inc.	1	127,787	1	127,787	—	—	—	—
Massachusetts General Hospital	63	21,915,816	56	21,055,197	7	860,619	—	—
Massachusetts Institute of Technology	16	8,194,531	14	8,103,411	2	91,120	—	—
Matrix Engineering	1	279,136	1	279,136	—	—	—	—
New England Medical Center Hospitals	22	7,529,920	20	6,723,540	1	43,772	1	762,608
New England Research Institutes, Inc.	5	2,563,339	5	2,563,339	—	—	—	—
Newton Scientific, Inc.	1	523,128	1	523,128	—	—	—	—
Northeastern University	2	486,410	2	486,410	—	—	—	—
Phylonix Pharmaceuticals, Inc.	1	149,974	1	149,974	—	—	—	—
Physical Sciences, Inc.	1	277,317	1	277,317	—	—	—	—
Radiation Monitoring Devices, Inc.	1	375,000	1	375,000	—	—	—	—
Schepens Eye Research Institute	2	91,408	—	—	2	91,408	—	—
Science Research Laboratory, Inc.	1	99,970	1	99,970	—	—	—	—
St. Elizabeth's Medical Center of Boston	11	4,979,549	11	4,979,549	—	—	—	—
Thermal Technologies, Inc.	1	378,167	1	378,167	—	—	—	—
Tufts University, Boston	11	3,554,797	10	3,478,657	1	76,140	—	—
University of Massachusetts Medical School	18	7,083,529	14	5,900,978	3	162,384	1	1,020,167
Whalen Biomedical, Inc.	2	797,664	1	376,664	—	—	1	421,000
Total Massachusetts	**574**	**239,396,408**	**501**	**220,298,073**	**64**	**11,039,107**	**9**	**8,059,228**

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Michigan								
Aastrom Biosciences, Inc.	1	460,060	1	460,060	—	—	—	—
AccuMed Systems, Inc.	1	100,000	1	100,000	—	—	—	—
American Red Cross SE Michigan	1	468,732	—	—	—	—	1	468,732
Case Western Reserve University, Henry Ford Health System Center	8	4,880,530	8	4,880,530	—	—	—	—
Mc-Three, Inc.	4	976,893	4	976,893	—	—	—	—
Michigan State University	13	2,311,927	12	2,268,155	1	43,772	—	—
Nephros Therapeutics, Inc.	1	354,700	1	354,700	—	—	—	—
Sentec Corporation	1	208,789	1	208,789	—	—	—	—
St. Joseph Mercy Oakland	1	416,958	1	416,958	—	—	—	—
Thromgen, Inc.	1	585,575	1	585,575	—	—	—	—
University of Michigan at Ann Arbor	87	30,662,671	79	29,133,875	7	1,248,314	1	280,482
Wayne State University	22	5,273,284	19	4,522,512	2	76,826	1	673,946
Total Michigan	**141**	**46,700,119**	**128**	**43,908,047**	**10**	**1,368,912**	**3**	**1,423,160**
Minnesota								
Advanced Medical Electronics Corporation	6	912,100	6	912,100	—	—	—	—
Care Point Diagnostics, Inc.	1	120,720	1	120,720	—	—	—	—
Data Sciences International, Inc.	3	768,944	3	768,944	—	—	—	—
Korosensor.Com, Inc.	1	99,822	1	99,822	—	—	—	—
Mayo Clinic, Rochester	59	16,897,245	48	15,801,749	9	840,920	2	254,576
Minneapolis Medical Research Foundation, Inc.	3	623,780	3	623,780	—	—	—	—
Sulzer IntraTherapeutics, Inc.	1	186,999	1	186,999	—	—	—	—
SurModics, Inc.	1	67,756	1	67,756	—	—	—	—
University of Minnesota, Twin Cities	88	37,335,841	74	29,052,916	7	1,421,473	7	6,861,452
ZirChrom Separations, Inc.	1	100,000	1	100,000	—	—	—	—
Total Minnesota	**164**	**57,113,207**	**139**	**47,734,786**	**16**	**2,262,393**	**9**	**7,116,028**
Mississippi								
Jackson State University	2	839,803	—	—	1	153,803	1	686,000
University of Mississippi	1	48,168	—	—	1	48,168	—	—
University of Mississippi Medical Center	14	7,409,537	9	3,584,504	2	68,454	3	3,756,579
Total Mississippi	**17**	**8,297,508**	**9**	**3,584,504**	**4**	**270,425**	**4**	**4,442,579**
Missouri								
Barnes-Jewish Hospital	21	6,877,518	21	6,877,518	—	—	—	—
Children's Mercy Hospital, Kansas City	1	124,850	1	124,850	—	—	—	—
Engineering Software Research and Development	1	99,917	1	99,917	—	—	—	—
MetaPhore Pharmaceuticals, Inc.	1	261,230	1	261,230	—	—	—	—
MRI Institute for Biomedical Research	1	262,257	1	262,257	—	—	—	—
St. Louis University	19	4,547,566	17	4,270,220	1	20,152	1	257,194
St. Luke's Hospital	1	10,000	1	10,000	—	—	—	—
University of Missouri, Columbia	25	5,954,274	20	5,594,234	5	360,040	—	—
University of Missouri, Kansas City	1	99,590	1	99,590	—	—	—	—
University of Missouri, St. Louis	1	235,540	1	235,540	—	—	—	—
Washington University	97	32,422,845	82	29,585,123	15	2,837,722	—	—
Total Missouri	**169**	**50,895,587**	**147**	**47,420,479**	**21**	**3,217,914**	**1**	**257,194**

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Montana								
Montana State University, Bozeman	2	1,069,632	2	1,069,632	—	—	—	—
Total Montana	**2**	**1,069,632**	**2**	**1,069,632**	**—**	**—**	**—**	**—**
Nebraska								
University of Nebraska, Lincoln	1	301,024	1	301,024	—	—	—	—
University of Nebraska Medical Center	13	5,016,994	12	4,831,218	1	185,776	—	—
Total Nebraska	**14**	**5,318,018**	**13**	**5,132,242**	**1**	**185,776**	**—**	**—**
Nevada								
City of Las Vegas	—	81,938	—	—	—	—	—	81,938
Sierra Biomedical Research Corporation	3	1,067,807	3	1,067,807	—	—	—	—
University of Nevada at Reno	13	3,466,854	11	2,392,696	1	40,196	1	1,033,962
Total Nevada	**16**	**4,616,599**	**14**	**3,460,503**	**1**	**40,196**	**1**	**1,115,900**
New Hampshire								
Creare Inc.	4	1,325,459	4	1,325,459	—	—	—	—
Dartmouth College	11	2,855,496	10	2,855,495	1	1	—	—
Psychological Applications, LLC	1	99,321	1	99,321	—	—	—	—
University of New Hampshire	1	134,874	1	134,874	—	—	—	—
Total New Hampshire	**17**	**4,415,150**	**16**	**4,415,149**	**1**	**1**	**—**	**—**
New Jersey								
Advanced Liquid Crystal Technologies	1	74,900	1	74,900	—	—	—	—
Collagen Matrix, Inc.	1	232,656	1	232,656	—	—	—	—
Continuum Dynamics, Inc.	1	385,389	1	385,389	—	—	—	—
Menssana Research, Inc.	1	375,000	1	375,000	—	—	—	—
Newark Beth Israel Medical Center	1	149,167	1	149,167	—	—	—	—
Palatin Technologies, Inc.	1	337,301	1	337,301	—	—	—	—
Princeton University	1	332,864	1	332,864	—	—	—	—
Rutgers, The State University of New Jersey, New Brunswick	3	501,108	2	305,447	1	195,661	—	—
University of Medicine and Dentistry of New Jersey (UMDNJ), Newark	17	8,249,369	16	8,163,315	1	86,054	—	—
UMDNJ, R.W. Johnson Medical School	9	2,530,166	9	2,530,166	—	—	—	—
UMDNJ, School of Osteopathic Medicine	1	321,045	1	321,045	—	—	—	—
Total New Jersey	**37**	**13,488,965**	**35**	**13,207,250**	**2**	**281,715**	**—**	**—**
New Mexico								
Lovelace Biomedical and Environmental Research Institute	1	350,000	1	350,000	—	—	—	—
New Mexico Resonance	1	513,382	1	513,382	—	—	—	—
U.S. Department of Veterans Affairs Medical Center, Albuquerque	1	628,257	—	—	—	—	1	628,257
University of New Mexico, Albuquerque	12	3,596,708	10	3,168,255	1	281,096	1	147,357
Total New Mexico	**15**	**5,088,347**	**12**	**4,031,637**	**1**	**281,096**	**2**	**775,614**
New York								
Albany Medical College of Union University	9	1,774,163	8	1,722,878	1	51,285	—	—
Angion Biomedica Corporation	—	68,000	—	68,000	—	—	—	—
Central New York Research Corporation	1	204,750	1	204,750	—	—	—	—

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Circulatory Technology, Inc.	1	99,999	1	99,999	—	—	—	—
City College of New York	3	720,852	3	720,852	—	—	—	—
Clear Solutions Biotech, Inc.	1	99,877	1	99,877	—	—	—	—
Columbia University, New York Morningside	5	1,314,631	4	1,272,635	1	41,996	—	—
Columbia University Health Sciences	85	36,362,028	76	33,315,615	7	1,115,745	2	1,930,668
Cornell University, Ithaca	6	1,589,308	6	1,589,308	—	—	—	—
CUNY Graduate School and University Center	1	325,000	1	325,000	—	—	—	—
Foster-Miller Technologies, Inc.	2	761,621	2	761,621	—	—	—	—
Genetica, Inc.	1	379,356	1	379,356	—	—	—	—
Herbert H. Lehman College	—	141,900	—	141,900	—	—	—	—
Hospital for Special Surgery	1	135,540	1	135,540	—	—	—	—
Institute for Basic Research in Developmental Disabilities	1	292,692	1	292,692	—	—	—	—
Mary Imogene Bassett Hospital	1	186,251	1	186,251	—	—	—	—
Masonic Medical Research Laboratory	2	558,179	2	558,179	—	—	—	—
Mohawk Innovative Technology, Inc.	1	255,045	1	255,045	—	—	—	—
Montefiore Medical Center, Bronx	2	351,022	2	351,022	—	—	—	—
Mount Sinai School of Medicine	31	13,518,805	29	13,062,064	2	456,741	—	—
National Hemophilia Foundation	1	10,000	1	10,000	—	—	—	—
New York Blood Center	3	1,860,895	3	1,860,895	—	—	—	—
New York Medical College	23	9,808,323	23	9,808,323	—	—	—	—
New York University	1	282,450	1	282,450	—	—	—	—
New York University School of Medicine	16	4,716,729	14	4,514,039	2	202,690	—	—
North Shore University Hospital	1	111,051	1	111,051	—	—	—	—
Public Health Research Institute	5	2,160,991	5	2,160,991	—	—	—	—
Queens College, CUNY	1	353,950	1	353,950	—	—	—	—
Rensselaer Polytechnic Institute	1	162,743	1	162,743	—	—	—	—
Riverside Research Institute	1	496,152	1	496,152	—	—	—	—
Rockefeller University	8	4,034,610	8	4,034,610	—	—	—	—
Roswell Park Cancer Institute Corporation	3	1,039,597	3	1,039,597	—	—	—	—
Sloan-Kettering Institute	10	2,248,104	8	2,095,146	1	42,628	1	110,330
St. Luke's-Roosevelt Hospital Center	1	503,687	1	503,687	—	—	—	—
St. Luke's Roosevelt Institute for Health Sciences	6	3,051,010	6	3,051,010	—	—	—	—
State University of New York at Albany	1	269,985	1	269,985	—	—	—	—
State University of New York at Buffalo	13	4,355,678	11	3,141,252	1	101,261	1	1,113,165
State University New York at Stony Brook	19	6,078,460	18	5,222,328	—	—	1	856,132
SUNY Downstate Medical Center	7	1,761,343	6	1,711,151	—	—	1	50,192
SUNY Upstate Medical University	6	2,806,191	5	2,764,195	1	41,996	—	—
Syracuse University	2	230,393	2	230,393	—	—	—	—
Trudeau Institute, Inc.	5	2,829,527	5	2,829,527	—	—	—	—
University of Rochester	57	18,380,274	53	17,174,844	4	1,205,430	—	—
V.I. Technologies, Inc. (Vitex)	1	265,000	1	265,000	—	—	—	—
Weill Medical College of Cornell University	47	26,426,676	43	25,928,173	4	498,503	—	—
Winthrop-University Hospital	1	444,970	1	444,970	—	—	—	—
Yeshiva University	21	12,337,981	19	10,352,700	1	196,738	1	1,788,543
ZeptoMetrix Corporation	1	367,650	1	367,650	—	—	—	—
Zylon Corporation	2	200,000	2	200,000	—	—	—	—
Total New York	**418**	**166,733,439**	**386**	**156,929,396**	**25**	**3,955,013**	**7**	**5,849,030**

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
North Carolina								
Artecel Sciences, Inc.	1	100,000	1	100,000	—	—	—	—
Carolinas Medical Center	1	318,543	1	318,543	—	—	—	—
Duke University	104	35,943,614	94	34,215,055	5	952,436	5	776,123
East Carolina University	3	578,695	3	578,695	—	—	—	—
North Carolina Central University	1	360,028	1	360,028	—	—	—	—
North Carolina State University at Raleigh	5	1,292,691	5	1,292,691	—	—	—	—
Research Triangle Institute	—	500,000	—	—	—	—	—	500,000
University of North Carolina at Chapel Hill	85	34,702,271	74	31,255,707	8	1,061,438	3	2,385,126
Volumetrics Medical Imaging, Inc.	1	306,020	1	306,020	—	—	—	—
Wake Forest University	44	22,705,843	36	17,091,644	3	790,751	5	4,823,448
Williams LifeSkills, Inc.	1	99,802	1	99,802	—	—	—	—
Winston-Salem State University	1	109,158	1	109,158	—	—	—	—
ZyCare, Inc.	1	637,699	1	637,699	—	—	—	—
Total North Carolina	**248**	**97,654,364**	**219**	**86,365,042**	**16**	**2,804,625**	**13**	**8,484,697**
North Dakota								
North Dakota State University	1	166,000	1	166,000	—	—	—	—
Total North Dakota	**1**	**166,000**	**1**	**166,000**	**—**	**—**	**—**	**—**
Ohio								
BIOMEC, Inc.	5	645,442	5	645,442	—	—	—	—
Case Western Reserve University	79	23,903,747	70	21,830,610	9	2,073,137	—	—
Celsus Laboratories, Inc.	1	107,000	1	107,000	—	—	—	—
ChanTest, Inc.	1	99,924	1	99,924	—	—	—	—
Children's Hospital Medical Center of Cincinnati	39	14,552,475	36	14,261,209	3	291,266	—	—
Children's Research Institute	1	40,196	—	—	1	40,196	—	—
Cleveland Clinic Foundation	48	15,712,174	42	15,114,917	5	332,941	1	264,316
Cleveland Medical Devices Inc.	3	708,162	3	708,162	—	—	—	—
Copernicus Therapeutics, Inc.	1	100,000	1	100,000	—	—	—	—
Enable Medical Corporation	1	100,000	1	100,000	—	—	—	—
Medical College of Ohio, Toledo	7	2,631,671	7	2,631,671	—	—	—	—
Ohio State University	26	9,089,077	22	6,790,879	2	236,628	2	2,061,570
Ohio University, Athens	1	311,171	1	311,171	—	—	—	—
The Lam Foundation	1	25,000	1	25,000	—	—	—	—
University of Cincinnati	41	14,810,790	37	13,607,315	3	525,198	1	678,277
University of Toledo	1	250,320	1	250,320	—	—	—	—
Wright State University	3	466,895	2	393,455	1	73,440	—	—
Total Ohio	**259**	**83,554,044**	**231**	**76,977,075**	**24**	**3,572,806**	**4**	**3,004,163**
Oklahoma								
Langston University	1	343,782	1	343,782	—	—	—	—
Oklahoma Medical Research Foundation	4	2,526,806	4	2,526,806	—	—	—	—
Oklahoma State University, Stillwater	1	257,371	1	257,371	—	—	—	—
University of Oklahoma Health Sciences Center	13	4,433,696	11	4,220,559	2	213,137	—	—
Total Oklahoma	**19**	**7,561,655**	**17**	**7,348,518**	**2**	**213,137**	**—**	**—**
Oregon								
AVI BioPharma, Inc.	1	329,625	1	329,625	—	—	—	—
Chemica Technologies, Inc.	1	100,000	1	100,000	—	—	—	—
Helix Research Company	1	512,502	—	—	—	—	1	512,502

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Hemonix, Inc.	1	114,543	1	114,543	—	—	—	—
Oregon Health & Science University	33	8,540,660	27	7,976,566	6	564,094	—	—
Oregon Research Institute	1	673,772	1	673,772	—	—	—	—
Oregon State University	1	421,240	1	421,240	—	—	—	—
Targeted Gene Delivery, Inc.	1	99,840	1	99,840	—	—	—	—
University of Oregon	2	616,865	2	616,865	—	—	—	—
Total Oregon	**42**	**11,409,047**	**35**	**10,332,451**	**6**	**564,094**	**1**	**512,502**
Pennsylvania								
Allegheny-Singer Research Institute	1	176,225	1	176,225	—	—	—	—
AntakaMatics, Inc.	2	194,701	2	194,701	—	—	—	—
Carnegie Mellon University	4	1,299,838	3	1,256,066	1	43,772	—	—
Children's Hospital of Philadelphia	37	20,229,569	33	19,443,689	4	785,880	—	—
Children's Hospital of Pittsburgh/UPMC Health System	2	454,498	2	454,498	—	—	—	—
Discovery Laboratories, Inc.	1	468,000	1	468,000	—	—	—	—
Drexel University	2	413,805	2	413,805	—	—	—	—
Eagle Vision Pharmaceutical Corporation	1	376,650	1	376,650	—	—	—	—
Ension Inc.	1	100,000	1	100,000	—	—	—	—
Fluent Cardiovascular Solutions, Inc.	1	100,000	1	100,000	—	—	—	—
Fox Chase Cancer Center	2	681,215	2	681,215	—	—	—	—
Guthrie Foundation for Education and Research	2	554,536	2	554,536	—	—	—	—
Insight Telehealth Systems, Inc.	1	150,000	1	150,000	—	—	—	—
Kelliher & Associates, Ltd.	1	100,000	1	100,000	—	—	—	—
King's College	1	301,641	1	301,641	—	—	—	—
Lankenau Institute for Medical Research	2	638,930	2	638,930	—	—	—	—
LifeSensors Inc.	1	152,362	1	152,362	—	—	—	—
Magee-Women's Hospital	2	507,758	2	507,758	—	—	—	—
MCP Hahnemann University	2	719,704	2	719,704	—	—	—	—
Medical Diagnostic Research Foundation	1	319,665	1	319,665	—	—	—	—
Molecular Targeting Technology, Inc.	1	372,700	1	372,700	—	—	—	—
Neo Gen Screening, Inc.	1	97,856	1	97,856	—	—	—	—
Octagen Corporation	1	412,000	1	412,000	—	—	—	—
Optical Devices, Inc.	1	333,750	1	333,750	—	—	—	—
Penn State University, Milton S. Hershey Medical Center	22	8,581,972	19	7,317,204	2	77,032	1	1,187,736
Pennsylvania State University, University Park	8	1,972,871	8	1,972,871	—	—	—	—
Spectrasonics Imaging, Inc.	1	305,099	1	305,099	—	—	—	—
SpectruMedix Corporation	1	375,062	1	375,062	—	—	—	—
Temple University	17	7,857,927	14	6,995,159	2	428,219	1	434,549
Thomas Jefferson University	23	7,619,387	21	7,386,979	2	232,408	—	—
University of Pennsylvania	128	48,368,595	106	43,535,146	21	3,982,112	1	851,337
University of Pittsburgh at Pittsburgh	78	35,858,659	69	33,059,573	4	550,758	5	2,248,328
Vascor, Inc.	1	114,231	1	114,231	—	—	—	—
Weis Center for Research, Geisinger Clinic	2	488,005	2	488,005	—	—	—	—
Wistar Institute	3	731,888	3	731,888	—	—	—	—
Total Pennsylvania	**355**	**141,429,099**	**311**	**130,606,968**	**36**	**6,100,181**	**8**	**4,721,950**
Rhode Island								
Brown University	6	1,489,549	5	1,440,603	1	48,946	—	—
Gordon Research Conferences	2	40,000	2	40,000	—	—	—	—

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Memorial Hospital of Rhode Island	3	2,721,362	2	864,279	—	—	1	1,857,083
Miriam Hospital	10	3,221,811	9	3,188,551	1	33,260	—	—
Pro-Change Behavior Systems, Inc.	2	833,836	2	833,836	—	—	—	—
Rhode Island Hospital	4	1,184,218	4	1,184,218	—	—	—	—
Total Rhode Island	**27**	**9,490,776**	**24**	**7,551,487**	**2**	**82,206**	**1**	**1,857,083**
South Carolina								
Clemson University	2	468,546	2	468,546	—	—	—	—
Medical University of South Carolina	35	11,953,307	30	11,329,664	4	588,320	1	35,323
University of South Carolina at Columbia	5	1,481,311	5	1,481,311	—	—	—	—
Total South Carolina	**42**	**13,903,164**	**37**	**13,279,521**	**4**	**588,320**	**1**	**35,323**
South Dakota								
Missouri Breaks Research, Inc.	2	1,292,860	2	1,292,860	—	—	—	—
University of South Dakota	3	631,295	2	596,890	1	34,405	—	—
Total South Dakota	**5**	**1,924,155**	**4**	**1,889,750**	**1**	**34,405**	**—**	**—**
Tennessee								
East Tennessee State University	5	1,018,497	5	1,018,497	—	—	—	—
Generx, Inc.	2	356,989	2	356,989	—	—	—	—
Meharry Medical College	10	1,391,523	7	896,193	3	495,330	—	—
St. Jude Children's Research Hospital	6	2,979,290	5	2,942,180	—	—	1	37,110
University of Memphis	6	2,722,414	6	2,722,414	—	—	—	—
University of Tennessee Health Science Center	20	6,090,714	17	4,518,988	2	361,043	1	1,210,683
University of Tennessee at Knoxville	1	190,028	1	190,028	—	—	—	—
Vanderbilt University	73	23,214,173	61	21,228,144	12	1,986,029	—	—
Total Tennessee	**123**	**37,963,628**	**104**	**33,873,433**	**17**	**2,842,402**	**2**	**1,247,793**
Texas								
Ambion, Inc.	1	100,000	1	100,000	—	—	—	—
Baylor College of Medicine	73	28,897,049	61	25,541,881	8	1,288,971	4	2,066,197
BioTex, Inc.	1	371,076	1	371,076	—	—	—	—
Colin Medical Instruments	1	100,000	1	100,000	—	—	—	—
Cooper Institute for Aerobics Research	2	939,736	2	939,736	—	—	—	—
Indus Instruments	1	91,703	1	91,703	—	—	—	—
Lynntech, Inc.	1	391,955	1	391,955	—	—	—	—
Millar Instruments, Inc.	1	139,234	1	139,234	—	—	—	—
Prairie View A&M University	—	142,614	—	142,614	—	—	—	—
Proportional Technologies, Inc.	2	488,181	2	488,181	—	—	—	—
Rice University	3	826,944	3	826,944	—	—	—	—
Southwest Foundation for Biomedical Research	7	9,041,293	6	8,263,397	—	—	1	777,896
Texas A&M University Health Science Center	20	4,406,647	19	4,356,697	1	49,950	—	—
Texas A&M University System	4	1,013,607	4	1,013,607	—	—	—	—
Texas A&M University, Kingsville	—	91,609	—	91,609	—	—	—	—
Texas Southern University	2	508,848	2	508,848	—	—	—	—
Texas Technical University Health Sciences Center	5	1,065,361	5	1,065,361	—	—	—	—
University of Houston, University Park	2	451,945	2	451,945	—	—	—	—
University of North Texas Health Science Center	8	1,738,439	7	1,657,771	1	80,668	—	—
University of Texas at Arlington	1	236,056	1	236,056	—	—	—	—
University of Texas at Austin	1	6,999	—	—	1	6,999	—	—
University of Texas at Dallas	1	260,657	1	260,657	—	—	—	—

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
University of Texas Health Center at Tyler	9	1,654,125	9	1,654,125	—	—	—	—
University of Texas Health Science Center Houston	36	16,047,618	31	8,672,434	3	113,741	2	7,261,443
University of Texas Health Science Center San Antonio	22	5,694,986	19	4,574,513	1	207,981	2	912,492
University of Texas M.D. Anderson Cancer Center	3	856,542	3	856,542	—	—	—	—
University of Texas Medical Branch Galveston	6	1,503,464	6	1,503,464	—	—	—	—
University of Texas at San Antonio	—	148,062	—	148,062	—	—	—	—
University of Texas Southwestern Medical Center at Dallas	56	24,236,165	50	23,077,509	5	1,122,659	1	35,997
Total Texas	**269**	**101,450,915**	**239**	**87,525,921**	**20**	**2,870,969**	**10**	**11,054,025**
Utah								
LDS Hospital	—	472,941	—	—	—	—	—	472,941
Thrombodyne, Inc.	2	480,388	2	480,388	—	—	—	—
University of Utah	55	18,862,491	50	18,223,947	5	638,544	—	—
Utah Artificial Heart Institute	1	1,124,126	1	1,124,126	—	—	—	—
Total Utah	**58**	**20,939,946**	**53**	**19,828,461**	**5**	**638,544**	**—**	**472,941**
Vermont								
University of Vermont and State Agricultural College	40	16,047,853	33	13,261,998	5	773,897	2	2,011,958
Total Vermont	**40**	**16,047,853**	**33**	**13,261,998**	**5**	**773,897**	**2**	**2,011,958**
Virginia								
CardioResearch, Inc.	1	397,933	1	397,933	—	—	—	—
Cottler Technologies, LLC	1	100,000	1	100,000	—	—	—	—
CW Optics, Inc.	1	411,754	1	411,754	—	—	—	—
Eastern Virginia Medical School of the Medical College of Hampton Roads	3	379,769	2	358,269	1	21,500	—	—
Empirical Technologies Corporation	1	301,473	1	301,473	—	—	—	—
Health Management Consultants of Virginia	1	99,997	1	99,997	—	—	—	—
Luna Innovations, Inc.	1	199,972	1	199,972	—	—	—	—
Personal Improvement Computer Systems	3	849,141	3	849,141	—	—	—	—
Talisman, Ltd.	1	483,641	1	483,641	—	—	—	—
University of Virginia, Charlottesville	55	18,777,641	44	17,079,597	10	1,392,820	1	305,224
Virginia Commonwealth University	17	4,253,002	14	4,071,413	3	181,589	—	—
Total Virginia	**85**	**26,254,323**	**70**	**24,353,190**	**14**	**1,595,909**	**1**	**305,224**
Washington								
Barlow Scientific	3	821,577	3	821,577	—	—	—	—
EKOS Corporation	2	1,069,500	2	1,069,500	—	—	—	—
Fred Hutchinson Cancer Research Center	13	23,226,467	11	7,244,938	—	—	2	15,981,529
Icogen Corporation	1	189,455	1	189,455	—	—	—	—
Inologic, Inc.	1	181,951	1	181,951	—	—	—	—
King County Emergency Medical Service	1	369,540	1	369,540	—	—	—	—
Pacific Technologies	1	99,965	1	99,965	—	—	—	—
Phantoms By Design	2	256,982	2	256,982	—	—	—	—
Puget Sound Blood Center and Program	3	644,639	3	644,639	—	—	—	—
Seattle Institute for Cardiac Research	1	669,974	1	669,974	—	—	—	—
Statistics and Epidemiology Research Corporation	1	2,401,000	—	—	—	—	1	2,401,000

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
The Hope Heart Institute	3	506,815	2	466,619	1	40,196	—	—
Therus Corporation	1	130,965	1	130,965	—	—	—	—
University of Washington	109	54,414,029	91	45,040,921	13	2,797,118	5	6,575,990
Virginia Mason Research Center	1	95,946	1	95,946	—	—	—	—
Washington State University	4	843,824	3	805,754	1	38,070	—	—
Total Washington	**147**	**85,922,629**	**124**	**58,088,726**	**15**	**2,875,384**	**8**	**24,958,519**
West Virginia								
West Virginia University	5	735,026	4	700,194	1	34,832	—	—
Total West Virginia	**5**	**735,026**	**4**	**700,194**	**1**	**34,832**	**—**	**—**
Wisconsin								
American Society of Gene Therapy	1	10,000	1	10,000	—	—	—	—
Blood Center of Southeastern Wisconsin	7	3,642,185	6	3,561,554	1	80,631	—	—
Eaker Epidemiology Enterprises, LLC	1	62,500	1	62,500	—	—	—	—
Marquette University	2	377,676	2	377,676	—	—	—	—
Marshfield Clinic	1	1,500,000	—	—	—	—	1	1,500,000
Medical College of Wisconsin	58	25,383,886	52	23,939,358	5	547,002	1	897,526
Mirus Corporation	1	362,786	1	362,786	—	—	—	—
Sinai Samaritan Medical Center	1	294,569	1	294,569	—	—	—	—
University of Wisconsin, Madison	59	20,562,734	55	19,184,587	3	543,878	1	834,269
Total Wisconsin	**131**	**52,196,336**	**119**	**47,793,030**	**9**	**1,171,511**	**3**	**3,231,795**
Wyoming								
University of Wyoming	1	172,150	1	172,150	—	—	—	—
Total Wyoming	**1**	**172,150**	**1**	**172,150**	**—**	**—**	**—**	**—**
Puerto Rico								
Ponce School of Medicine	1	135,391	1	135,391	—	—	—	—
U.S. Department of Veterans Affairs Medical Center	1	58,378	1	58,378	—	—	—	—
Universidad Central Del Caribe	—	179,757	—	179,757	—	—	—	—
University of Puerto Rico Medical Sciences	—	87,329	—	87,329	—	—	—	—
University of Puerto Rico Rio Piedras	—	270,057	—	270,057	—	—	—	—
Total Puerto Rico	**2**	**730,912**	**2**	**730,912**	**—**	**—**	**—**	**—**
Total, United States	**5,340**	**$2,081,215,379**	**4,679**	**$1,789,806,813**	**481**	**$72,205,391**	**180**	**$219,203,175**
Australia								
Institute of Medical and Veterinary Science	1	200,000	1	200,000	—	—	—	—
National Centre/HIV Epidemiology/Clinical Research	1	200,000	1	200,000	—	—	—	—
Peter MacCallum Cancer Institute	1	175,000	1	175,000	—	—	—	—
Royal Melbourne Hospital	1	175,000	1	175,000	—	—	—	—
Victor Chang Cardiac Research Institute	1	135,651	1	135,651	—	—	—	—
Walter and Eliza Hall Institute of Medical Research	1	161,487	1	161,487	—	—	—	—
Total Australia	**6**	**1,047,138**	**6**	**1,047,138**	**—**	**—**	**—**	**—**
Belgium								
University of Antwerp	1	119,209	1	119,209	—	—	—	—
Total Belgium	**1**	**119,209**	**1**	**119,209**	**—**	**—**	**—**	**—**

Institution	Totals		Grants		Research Development		Research Training and Contracts	
	No.	Dollar	No.	Dollar	No.	Dollar	No.	Dollar
Canada								
Clinical Research Institute of Montreal	3	739,254	3	739,254	—	—	—	—
Hospital for Sick Children, Toronto	4	1,157,566	4	1,157,566	—	—	—	—
Institute de Recherches Cliniques de Montreal	1	200,000	1	200,000	—	—	—	—
London Health Sciences Center	1	706,312	—	—	—	—	1	706,312
McGill University	1	300,000	1	300,000	—	—	—	—
Ontario Cancer Institute	1	200,000	1	200,000	—	—	—	—
Ottawa Hospital Research Institute	1	250,000	1	250,000	—	—	—	—
Sunnybrook and Women's College Health Sciences Center	1	223,905	1	223,905	—	—	—	—
University Health Network	1	250,000	1	250,000	—	—	—	—
University of British Columbia	5	988,638	3	796,019	1	49,412	1	143,207
University of Calgary	1	233,378	1	233,378	—	—	—	—
University of Manitoba	2	162,091	2	162,091	—	—	—	—
Total Canada	**22**	**5,411,144**	**19**	**4,512,213**	**1**	**49,412**	**2**	**849,519**
Finland								
University of Turku	1	40,196	—	—	1	40,196	—	—
Total Finland	**1**	**40,196**	**—**	**—**	**1**	**40,196**	**—**	**—**
Israel								
Technion-Israel Institute of Technology	1	125,000	1	125,000	—	—	—	—
Total Israel	**1**	**125,000**	**1**	**125,000**	**—**	**—**	**—**	**—**
Russia								
Central Institute for Tuberculosis	1	175,000	1	175,000	—	—	—	—
Total Russia	**1**	**175,000**	**1**	**175,000**	**—**	**—**	**—**	**—**
Spain								
Municipal Institute of Medical Research	1	134,353	1	134,353	—	—	—	—
Total Spain	**1**	**134,353**	**1**	**134,353**	**—**	**—**	**—**	**—**
United Kingdom								
University of London King's College, London	1	200,000	1	200,000	—	—	—	—
University of London University College, London	1	141,730	1	141,730	—	—	—	—
University of London National Heart and Lung Institute	1	330,100	1	330,100	—	—	—	—
University of Sheffield	1	125,000	1	125,000	—	—	—	—
University of Southampton	1	225,000	1	225,000	—	—	—	—
Total United Kingdom	**5**	**1,021,830**	**5**	**1,021,830**	**—**	**—**	**—**	**—**
Total, Other	**38**	**$8,073,870**	**34**	**$7,134,743**	**2**	**$89,608**	**2**	**$849,519**
Grand Total	**5,378**	**$2,089,289,249**	**4,713**	**$1,796,941,556**	**483**	**$72,294,999**	**182**	**$220,052,694**

Appendixes

Types of Research Activity

List of Abbreviations and Acronyms

Index

Types of Research Activity

Research Projects

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

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

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

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

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

Resource-Related Research Projects (R24): To support research projects that will enhance the capability of resources to serve biomedical research in areas related to cardiovascular, lung, and blood health and diseases; blood resources; and sleep disorders.

First Independent Research Support and Transition (FIRST) Award (R29): To provide a sufficient initial period of research support for newly independent biomedical investigators to develop their research capabilities and demonstrate the merit of their research ideas.

Method To Extend Research in Time (MERIT) Award (R37): To provide long-term research grant support to investigators whose research competency and productivity are distinctly superior and thus are likely to continue to perform in an outstanding manner. Investigators may not apply for a MERIT award; instead, they are selected by the NHLBI on the basis of their current grant applications and their present and past grant support.

Small Business Technology Transfer (STTR) Grants—Phase I (R41): To support cooperative R&D projects between small business concerns and research institutions, limited in time and amount, to establish the technical merit and feasibility of ideas that have potential for commercialization. Awards are made to small business concerns only.

Small Business Technology Transfer (STTR) Grants—Phase II (R42): To support in-depth development of cooperative R&D projects between small business concerns and research institutions, limited in time and amount, whose feasibility has been established in Phase I and that have potential for commercialization. Awards are made to small business concerns only.

Small Business Innovation Research (SBIR) Grants, Phase I (R43): To support projects, limited in time and amount, to establish the technical merit and feasibility of research and development ideas that may ultimately lead to commercial products or services.

Small Business Innovation Research (SBIR) Grants, Phase II (R44): To support research project ideas that have been shown to be feasible in Phase I and that are likely to result in commercially marketable products or services.

Research Centers

Center Core Grants (P30): To support shared resources and facilities for basic, clinical, behavioral, and translational research in the prevention, detection, and treatment of HIV infection and AIDS.

Specialized Centers of Research (SCOR) Grants (P50): To support both basic and clinical research related to an Institute-identified theme. The spectrum of SCOR activities comprises multidisciplinary approaches to specific disease entities or biomedical problem areas. The SCOR grants differ from research program projects in that they are in response to an announcement of programmatic needs of the Institute. Centers may be asked to perform additional studies because of urgently needed information or may serve as a regional or national resource for special purpose research.

Comprehensive Centers Grants (P60): To support a multipurpose unit designed to bring together into a common focus divergent but related facilities within a given community; to foster biomedical research and development at both the fundamental and clinical levels; to initiate and expand community education, screening, and counseling programs; and to educate medical and allied health professionals concerning problems of diagnosis and treatment of specific diseases such as sickle cell anemia.

Research Career Programs

Mentored Research Scientist Development Award for Minority Faculty (K01): To support underrepresented minority faculty members with varying levels of research experience to prepare them for research careers as independent investigators.

Minority Institution Faculty Mentored Research Scientist Development Award (K01): To support at minority institutions faculty members who have the interest and potential to conduct state-of-the-art research in the areas of cardiovascular, pulmonary, or hematologic disease, or in sleep disorders.

Independent Scientist Award (K02): To enhance the research capability of promising individuals in the formative stages of their careers of independent research in the sciences related to heart, lung, and blood diseases; blood resources; and sleep disorders.

Research Career Development Award (RCDA) (K04): To foster the development of young scientists with outstanding research potential for careers of independent research in the sciences related to heart, lung, and blood diseases and blood resources. New grants are no longer awarded.

Research Career Award (RCA) (K06): To assist institutions in supporting established investigators of high competency for the duration of their careers. New grants are no longer awarded.

Academic Award (K07): To support an individual with an academic appointment to introduce or improve a disease curriculum that will enhance the academic or research environment of the applicant institution as well as further the individual's own career. This award series includes the Preventive Cardiology Academic Award, the Preventive Pulmonary Academic Award, the Transfusion Medicine Academic Award, and the Systemic Pulmonary and Vascular Diseases Academic Awards, the Asthma Academic Award, the Tuberculosis Academic Award, the Sleep Academic Award, and the Nutrition Academic Award. New grants are no longer awarded in the Pulmonary Academic Program.

Clinical Investigator Development Award (CIDA) (K08): To provide an opportunity for clinically trained physicians to develop research skills and gain experience in advanced research methods and experimental approaches in basic and applied sciences relevant to cardiovascular, pulmonary, and hematological diseases. This award was developed as a means to encourage clinical investigators to engage in research in specific areas designated by the Institute.

Physician Scientist Award (PSA) (K11): To encourage newly trained clinicians to develop independent research skills and experience in one of the fundamental sciences. New grants are no longer awarded.

Minority School Faculty Development Award (K14): To develop faculty investigators at minority schools and to enhance their research capabilities in areas related to heart, lung, and blood diseases; blood resources; and sleep disorders. New grants are no longer awarded.

Research Development Award for Minority Faculty (K14): To encourage the development of minority faculty investigators and to enhance their research capabilities in areas related to cardiovascular, lung, and blood health and disease; transfusion medicine; and sleep disorders.

Mentored Patient-Oriented Research Career Development Award (K23): To provide support for career development to investigators who have made a commitment to focus their research endeavors on patient-oriented research.

Midcareer Investigator Award in Patient-Oriented Research (K24): To provide support for clinicians to allow them "protected time" to devote to patient-oriented research and to act as mentors for beginning clinical investigators.

Clinical Research Curriculum Award (CRCA) (K30): To stimulate inclusion of high-quality, multidisciplinary didactic training in fundamental skills, methodology, theories, and conceptualization as part of the career development of clinical investigators.

Other Research Grants

Exploratory Grants (P20): To support planning for new programs, expansion or modification of existing resources, and feasibility studies to explore various approaches to the development of interdisciplinary programs that offer potential solutions to problems of special significance to the mission of the NHLBI.

Animal (Mammalian and Nonmammalian) Model and Animal and Material Resource Grant (P40): To develop and support animal models, or animal or biological materials resources. Nonmammalian resources include nonmammalian vertebrates, invertebrates, cell systems, and nonbiological systems.

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.

Exploratory/Developmental Grants (R21): To encourage the development of new research activities in heart, lung, and blood diseases and sleep disorders program areas.

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.

Exploratory/Developmental Grant (R33): To provide phase II support for innovative exploratory and developmental research activities initiated under the R21 mechanism.

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.

Continuing Education Training Grant (T15): To assist professional schools and other public and nonprofit institutions to establish, expand, or improve programs of continuing professional education, especially for programs dealing with new scientific developments.

Scientific Review and Evaluation (U09): To support an initial Scientific Review Group responsible for the assessment of scientific and technical merit of grant applications.

Conference (Cooperative Agreements) (U13): To support international, national, or regional meetings; conferences; and workshops where substantial programmatic involvement is planned to assist the recipient.

Resource-Related Research Projects (U24): To support research projects contributing to improvement of the capability of resources to serve biomedical research.

Historical Black College and University Scientist Award (UH1): To strengthen and augment the human resources at historically black colleges and universities (HBCUs) by recruiting an established research scientist into their biomedical or behavioral sciences department; to enhance the career of the recruited research scientist; and to strengthen other HBCU resources for the conduct of biomedical or behavioral research in areas related to cardiovascular, lung, and blood health and disease; transfusion medicine; and sleep disorders.

Individual National Research Service Awards (NRSA)

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

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

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

Minority Access to Research Careers (MARC) NRSA 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.

NRSA Short-Term Research Training (T35 and T35S): To provide individuals with research training during off-quarters or summer periods to encourage research careers or to encourage research in areas of national need. This program includes the Short-Term Training for Minority Students Program and short-term training for students in health professional schools.

MARC Visiting Professors for Minority Institutions (T36): To increase the number of well-trained minority scientists in biomedical disciplines and to strengthen the research and teaching capabilities of minority institutions.

Other Support

Research and Development Contracts (N01): To develop or apply new knowledge or test, screen, or evaluate a product, material, device, or component for use by the scientific community.

NIH Interagency Agreements (Y01): To provide a source of funds to another Federal agency to acquire specific products, services, or studies.

NIH Intra-Agency Agreements (Y02): To provide a source of funds to another NIH component to acquire specific products, services, or studies.

Minority Research Supplements Programs: To provide supplemental funds to active NHLBI grants to support the research of minority high school, undergraduate, and graduate students; postdoctoral trainees; and investigators.

List of Abbreviations and Acronyms

ACCESS	A Case-Controlled Etiologic Study of Sarcoidosis
ACCORD	Action to Control Cardiovascular Complications in Diabetes
ACE	angiotensin converting enzyme
ACES	Azithromycin and Coronary Artery Events Study
ACRN	Asthma Clinical Research Network
AFFIRM	Atrial Fibrillation Follow-up: Investigations in Rhythm Management
AIDS	acquired immunodeficiency syndrome
ALLHAT	Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial
ARDS	acute respiratory distress syndrome
ARDSNET	Acute Respiratory Distress Syndrome Clinical Network
ARIC	Atherosclerosis Risk in Communities
ATP III	Adult Treatment Panel III
AVID	Antiarrhythmic Versus Implantable Defibrillator
BARI 2D	Bypass Angioplasty Revascularization Investigation in Type 2 Diabetics
BP	blood pressure
CAMP	Childhood Asthma Management Program
CARDIA	Coronary Artery Risk Development in Young Adults
CARE	Childhood Asthma Research and Education Network
CCSCD	Clinical Course of Sickle Cell Disease
CF	cystic fibrosis
CFAR	Centers for AIDS Research
CHD	coronary heart disease
CHF	congestive heart failure
CHS	Cardiovascular Health Study
CIDA	Clinical Investigator Development Award
CLD	chronic lung disease
CMMP	Clinical and Molecular Medicine Program
COPD	chronic obstructive pulmonary disease
CSCC	Comprehensive Sickle Cell Centers
CSGA	Collaborative Studies on the Genetics of Asthma
CVD	cardiovascular diseases
DASH	Dietary Approaches to Stop Hypertension
DBDR	Division of Blood Diseases and Resources
DECA	Division of Epidemiology and Clinical Applications
DHVD	Division of Heart and Vascular Diseases
DIR	Division of Intramural Research
DLD	Division of Lung Diseases
EDUC	Enhanced Dissemination and Utilization Center
ENRICHD	Enhancing Recovery in Coronary Heart Disease
ESCAPE	Evaluation Study of Congestive Heart Failure and Pulmonary Artery Catheterization Effectiveness
ETS	environmental tobacco smoke
FIRST	First Independent Research Support and Transition
FORTE	Feasibility of Retinoid Treatment in Emphysema

FY	fiscal year
GEMS	Girls Health Enrichment Multisite Studies
GENCAC	Genetics of Coronary Aortic Calcification
GOCADAN	Genetics of Coronary Artery Disease in Alaskan Natives
GVHD	graft versus host disease
HBCU	historically black colleges and universities
HDL	high-density lipoprotein
HEIRS	Hemochromatosis and Iron Overload Screen Study
HEW	Department of Health, Education, and Welfare (now HHS)
HHS	Health and Human Services (formerly HEW)
HIV	human immunodeficiency virus
HRT	hormone replacement therapy
ICD	International Classification of Diseases; also, implantable cardiac defibrillator
IVAS	Innovative Ventricular Assist System
JHS	Jackson Heart Study
LAM	lymphangioleiomyomatosis
LDL	low-density lipoprotein
MAGIC	Magnesium in Coronaries
MARC	Minority Access to Research Careers
MBRS	Minority Biomedical Research Support
MERIT	Method to Extend Research in Time
MESA	Multi-Ethnic Study of Atherosclerosis
MGS	Mammalian Genotyping Service
MI	myocardial infarction
MOST	Mode Selection Trial in Sinus Node Dysfunction
NAEPP	National Asthma Education and Prevention Program
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
NIA	National Institute on Aging
NICHD	National Institute of Child Health and Human Development
NIDDK	National Institute of Diabetes and Digestive and Kidney Diseases
NIDDM	noninsulin-dependent diabetes mellitus
NIH	National Institutes of Health
NIMH	National Institute of Mental Health
NRSA	National Research Service Award
OAR	Office of AIDS Research
OAT	Occluded Artery Trial
OD	Office of the Director
OEI	Obesity Education Initiative
OPEC	Office of Prevention, Education, and Control
OSA	obstructive sleep apnea

P2C2	Pediatric Pulmonary Cardiac Complication of HIV
PA	Program Announcement
PAD	Public Access Defibrillation
PAHI	Pan American Hypertension Initiative
PAHO	Pan American Health Organization
PEACE	Prevention of Events With Angiotensin Converting Enzyme Inhibitor Therapy
PEGT	Programs of Excellence in Gene Therapy
PGA	Programs for Genomic Applications
PHS	Public Health Service
PIOPED	Prospective Investigation of Pulmonary Embolism Diagnosis
R&D	research and development
REDS	Retrovirus Epidemiology Donor Study
REMATCH	Randomized Evaluation of Mechanical Assistance for the Treatment of Congestive Heart Failure
RFA	Request for Applications
RFP	Request for Proposals
RMS	research management and support
RPG	research project grant
SBIR	Small Business Innovation Research
SCD	sickle cell disease
SCD-HeFT	Sudden Cardiac Death in Heart Failure Trial
SCOR	Specialized Center(s) of Research
SDB	sleep-disordered breathing
SEP	Special Emphasis Panel
SES	socioeconomic status
SIDS	sudden infant death syndrome
STOP	Stroke Prevention in Sickle Cell Anemia
STTR	Small Business Technology Transfer
TBAA	Tuberculosis Academic Award
TAAG	Trial of Activity for Adolescent Girls
TB	tuberculosis
VATS	Viral Activation Transfusion Study
WAVE	Women’s Angiographic Vitamin and Estrogen Trial
WELL-HART	Women’s Estrogen/Progestin Lipid Lowering Hormone Atherosclerosis Regression Trial
WHI	Women’s Health Initiative
WISE	Women’s Ischemia Syndrome Evaluation
WHO	World Health Organization

Index

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