

A PARTNERSHIP FOR HEALTH:

MINORITIES IN BIOMEDICAL RESEARCH



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

National Institute of Allergy and Infectious Diseases
2005–2006

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FOREWORD

The National Institute of Allergy and Infectious Diseases (NIAID) conducts and supports basic and applied research to better understand, treat, and ultimately prevent infectious, immunologic, and allergic diseases. For more than 50 years, NIAID research has led to new therapies, vaccines, diagnostic tests, and other technologies that have improved the health of millions of people in the United States and around the world. Through these programs, NIAID maintains its commitment to improve the health of diverse populations, reduce health disparities, and attract scientists from diverse backgrounds to infectious and immunologic disease research.

The scope of the NIAID research portfolio that affects the health of racial and ethnic populations in the United States has expanded considerably in recent years in response to new and continuing challenges such as HIV/AIDS, tuberculosis, sexually transmitted infections, hepatitis C virus, autoimmune diseases, immune response in the context of transplantation research, and the increase in asthma prevalence among children. The growth of NIAID programs has been driven not only by its mission areas but also by unprecedented scientific opportunities in the core NIAID scientific disciplines of microbiology, immunology, and infectious disease. Advances in these key fields have led to a better understanding of the human immune system and the mechanisms of infectious and immune-mediated diseases.

NIAID is committed to improving national and international health through the rigorous pursuit of effective vaccines for human disease. Research supported by NIAID has led to new or improved vaccines for a variety of diseases, including rabies, meningitis, pertussis, hepatitis A and B, chicken pox, and pneumococcal pneumonia. One of the important challenges of the 21st century is developing safe and effective vaccines for the three greatest microbial killers worldwide: HIV/AIDS, malaria, and tuberculosis. These diseases account for one-third to one-half of healthy years lost in less developed countries. In the United States, HIV/AIDS continues to disproportionately affect African Americans and Hispanics. NIAID has a robust portfolio of research to develop drugs, vaccines, and prevention measures and approaches to reduce the impact of HIV/AIDS and other diseases of global importance on underserved and socioeconomically deprived populations.

The Institute has worked hard to ensure that persons from diverse and socioeconomically deprived populations are included in all phases of its research programs, including clinical trials. NIAID also strives to increase the diversity of scientists in biomedical research by supporting undergraduate, graduate, and postgraduate research training in immunologic and infectious diseases. The Institute offers education programs and outreach activities that address health disparities in the United States. NIAID intends to continue to strengthen its efforts to address health disparities as a critical part of fulfilling its overall scientific mission. The Institute is committed to advancing research on the diseases that contribute to health disparities, increasing outreach to affected communities throughout the United States, and fostering the training of a new cadre of scientists from underrepresented and disadvantaged backgrounds. These efforts, described here in *A Partnership for Health: Minorities in Biomedical Research*, will help to address the crucial NIAID research agenda in a manner that includes all segments of the population.



Anthony S. Fauci, MD
Director, NIAID

EXECUTIVE SUMMARY

For more than 50 years, the National Institute of Allergy and Infectious Diseases (NIAID) has made progress in understanding, preventing, and treating the infectious and immunologic diseases that are known to occur with disproportionate frequency in minority populations. The Institute continues to address these health disparities by supporting efforts to increase the diversity of its scientific workforce and the participation of underrepresented and disadvantaged communities in clinical research. The Institute also supports targeted outreach activities that communicate research developments and health risks to diverse communities.

Asthma and Allergic Diseases

NIAID's Asthma and Allergic Diseases Research Centers program is the cornerstone of the pathobiology component of the Institute's asthma and allergy research. This national network of centers conducts basic and clinical research on the mechanisms, diagnosis, treatment, and prevention of asthma and allergic diseases. The Inner-City Asthma Consortium, established in 2002 by NIAID in conjunction with the National Institute of Environmental Health Sciences, evaluates the safety and efficacy of promising immune-based asthma treatments developed to reduce asthma severity and prevent the onset of disease in inner-city children. In 2005, NIAID established the Food Allergy Research Consortium in response to a series of recommendations from an expert panel convened in 2003. The consortium conducts studies and develops educational programs on food allergies aimed at parents, children, and health care providers. Also in 2005, NIAID partnered

with the National Heart, Lung, and Blood Institute to establish Asthma Exacerbations: Biology and Diseases Progression, an initiative that supports basic and clinical research projects to elucidate the underlying pathobiology of asthma exacerbations and mechanisms for their resolution.

Autoimmune Diseases

NIAID supports a broad portfolio of basic, preclinical, and clinical research aimed at understanding the pathogenesis of autoimmune diseases. Among these efforts are the Autoimmunity Centers of Excellence, which support collaborative basic and clinical research on autoimmune diseases, including pilot clinical trials of immunomodulatory therapies. In addition, the Institute's Autoimmune Disease Prevention Centers conduct basic research on the development of new targets and approaches to prevent autoimmune diseases. Other efforts include the Sex-Based Differences in the Immune Response research initiative; the Immune Tolerance Network, an international consortium of more than 80 investigators throughout the United States, Canada, Europe, and Australia; and the NIAID Clinical Trials Network for Stem Cell Transplantation for Autoimmune Diseases. NIAID also supports the Multiple Autoimmune Disease Genetics Consortium, a repository of genetic and clinical data and materials from families in which two or more individuals are affected by two or more distinct autoimmune diseases. NIAID chairs the National Institutes of Health's (NIH's) Autoimmune Diseases Coordinating Committee, established in fiscal year 1998 at the request of Congress to increase collaboration and facilitate coordination of

research among NIH Institutes and Centers, other Federal agencies, and private groups interested in these diseases.

Transplantation

In 2003, NIAID renewed the Cooperative Clinical Trials in Pediatric Transplantation program, which supports multicenter clinical trials of novel approaches to prevent acute and chronic graft rejection in pediatric kidney transplantation, evaluates modifications of immunosuppressive drug regimens to mitigate unwanted side effects of immunosuppression, and assesses pre-transplant immunotherapy to improve transplantation outcomes. In 2001, NIAID and the National Heart, Lung, and Blood Institute renewed the Immunopathogenesis of Chronic Graft Rejection Program, designed to enhance knowledge of chronic graft failure. This program will enhance understanding of both the immunologic and nonimmunologic mechanisms underlying chronic graft rejection, improve diagnostic criteria to predict graft failure, and identify novel approaches for clinical intervention.

NIAID, in collaboration with the National Institute of Diabetes and Digestive and Kidney Diseases and the National Heart, Lung, and Blood Institute, also supports the Clinical Trials in Organ Transplantation. The goal of this consortium is to develop and implement interventional and observational clinical studies accompanied by mechanistic studies. In addition, with co-sponsorship from the National Institute of Neurological Disorders and Stroke, NIAID launched the new program Human Leukocyte Antigen Region Genetics in Immune-Mediated Diseases in 2005. This program will define the association between human leukocyte antigen region genes or genetic markers and immune-mediated diseases, including risk and severity of disease, and organ and cell transplantation outcomes. NIAID also supports efforts to increase organ donation by improving donor registries and developing and testing educational interventions.

Tuberculosis

NIAID is supporting research to help fight tuberculosis (TB) among both domestic and global populations by developing a solid knowledge base about the disease and its pathogen (*Mycobacterium tuberculosis*) and translating this knowledge base into new tools and medicines for improved diagnosis, treatment, and prevention. A cornerstone in NIAID's global fight against TB is the Tuberculosis Research Unit. This multidisciplinary, international team is dedicated to improving the understanding of *M. tuberculosis*, defining how the host's immune system responds to infection by this pathogen, developing new epidemiologic tools to understand how TB is transmitted, and evaluating new or improved drugs, diagnostics, and vaccines. NIAID is also supporting epidemiological studies that are specifically focused on issues relevant to North American Hispanic populations that are affected by TB. These studies are examining variables such as which strains of *M. tuberculosis* are circulating in these populations, risk factors for disease, routes of transmission, and effectiveness of interventions.

Sexually Transmitted Infections Other Than HIV/AIDS

NIAID supports individual investigator-initiated research grants and a variety of research programs for the development of more effective prevention and treatment approaches to control sexually transmitted infections (STIs) other than HIV/AIDS. Research efforts include developing and licensing vaccines, topical microbicides, and treatments for STIs; understanding the long-term health impacts of sexually transmitted pathogens in various populations; stimulating basic research on the pathogenesis, immunity, and structural biology of these pathogens; and developing better and more rapid diagnostics. NIAID has created an extensive infrastructure for conducting basic and applied research on STIs, including the STI Cooperative Research Centers, the STI

Clinical Trials Unit, and the Topical Microbicides Program projects. NIAID supports several clinical and epidemiological studies that focus on STIs in racial and ethnic populations. The goals of these studies include identifying risk factors for STIs in diverse populations, examining the relationship of STIs to infertility and pregnancy outcomes, and evaluating the effectiveness of prevention and control strategies in these communities. NIAID also supports training of scientists in the area of STI research. Through a collaborative training program with the Sexually Transmitted Disease Cooperative Research Center, NIAID supports a research program with second-year medical students from Howard University in Washington, DC. This program provides students with 10 weeks of STI research experience at the Cooperative Research Center with the long-term objective of encouraging young physicians to pursue careers in STI research.

Hepatitis C

NIAID has a robust program in hepatitis C virus (HCV) research that includes efforts to understand the disease's mechanisms of transmission and progression, characterize host immune responses, and prevent or reverse disease progression. One of the cornerstones of NIAID's HCV effort is the Hepatitis C Cooperative Research Centers, which were launched in 1996 as basic and clinical research units devoted to understanding HCV infection and disease processes. The goals of the Centers are to identify the components of HCV, better understand the body's immune response to the virus, determine the individual genetic factors that have a crucial impact on recovery from initial and chronic infection, track disease progression and severity, and determine how cofactors such as HIV/AIDS influence HCV disease. Clinical research emphasizes studies in special populations (e.g., African Americans and Alaska Natives) that are heavily affected by HCV and that respond poorly to standard therapies.

HIV/AIDS

NIAID works with communities to identify and overcome barriers to participating in clinical trials. NIAID has also taken a leadership role by involving community representatives in various local, national, and international research activities. NIAID directs a large clinical trials program on HIV/AIDS therapeutics, consisting of three networks: the AIDS Clinical Trials Group, International Maternal Pediatric Adolescent AIDS Clinical Trials, and International Network for Strategic Initiatives in Global HIV Trials. These networks strive to ensure that a sufficient proportion of racial and ethnic individuals are enrolled in clinical trials. Other efforts supported by NIAID include the Women's Interagency HIV/AIDS Study, which explores the clinical course of HIV/AIDS in women, focusing on women of color; and the Multicenter AIDS Cohort Study, a prospective, longitudinal study of HIV/AIDS in homosexual and bisexual men.

NIAID continues to support efforts to develop an effective HIV vaccine for use around the world through the HIV Vaccine Trials Network. The Network was established in 2000 to foster the development of preventive HIV vaccines through the conduct of domestic and international clinical trials and collaborations with government and non-government organizations, such as the U.S. Military HIV Research Program, the International AIDS Vaccine Initiative, the Global HIV Vaccine Enterprise, and the Centers for Disease Control and Prevention. NIAID is also actively involved in educating the public about HIV vaccine research through the NIAID HIV Vaccine Research Education Initiative, particularly in African Americans, Hispanics, high-risk women, and men who have sex with men. The NIAID Vaccine Research Center also conducts research facilitating the rigorous pursuit of effective vaccines against HIV and other human diseases.

NIAID's HIV Prevention Trials Network is a global network of domestic and international clinical trial sites that explores a variety of nonvaccine prevention strategies to reduce HIV/

AIDS transmission. These strategies include the testing and development of biomedical and behavioral intervention programs. In addition, NIAID recently established the Microbicides Trials Network for the development and evaluation of topical microbicides. These networks also strive for diversity in participation and enrollment in clinical trials.

NIAID Outreach Activities

NIAID's outreach activities include producing and publicizing print, audiovisual, and Web-based materials, distributing materials at professional and community meetings, and sponsoring workshops and conferences for community health care providers and the public. The Institute produces materials on allergic and immunologic diseases, HIV/AIDS, STIs, and illnesses potentially caused by agents of bioterrorism, keeping more than 400 voluntary and scientific organizations updated about its activities. NIAID has also provided outreach at the Annual Black Family Reunion, the Annual Biomedical Research Conference for Minority Students, and the National Conference on Blacks in Higher Education. It also offers a public-speaking component consisting of researchers who will speak upon request to community groups and at public schools. NIAID co-sponsored a trans-NIH community awareness program addressing cancer awareness, self-management techniques for asthma sufferers, and the silent damage done to the body by hypertension.

Training and Enhancement Programs for Diversity in Research

Through innovative programs and outreach efforts, NIAID continually works to increase the diversity of its researchers in the field of biomedical research through various NIH-supported programs. The Minority Biomedical Research Support Program is one of the largest NIH programs working toward the goal of

increasing diversity in biomedical research. Support of Continuous Research Excellence provides financial assistance to competitive research programs in all areas of biomedical and behavioral research. The Research Initiative for Scientific Enhancement seeks to enhance the research environment at resource-limited institutions through faculty and student development—specifically, by increasing the interests, skills, and competitiveness of students and faculty who are pursuing biomedical research careers. The Initiative for Minority Student Development encourages domestic, private, and public educational institutions with fully developed and funded research programs to initiate and/or expand innovative programs to target underrepresented and disadvantaged students. The Minority Access to Research Careers Undergraduate Student Training in Academic Research program provides support for underrepresented students in the biomedical sciences who are enrolled at institutions with significant student diversity. The Research Supplements to Promote Diversity in Health-Related Research program seeks to increase the number of underrepresented and disadvantaged investigators in biomedical research. The Research Centers in Minority Institutions program provides grant support to Historically Black Colleges and Universities and other colleges and universities with health professional schools and graduate institutions that offer a doctorate in the health professions or health-related sciences.

NIAID established the Bridging the Career Gap for Underrepresented Minority Students initiative in 1993 to increase the number of underrepresented investigators in biomedical research. Targeting individuals who receive NIAID Diversity Supplement awards, Bridging the Career Gap seeks to provide young investigators with the tools and information they need for a successful career in biomedical research. NIAID also promotes the development of scientists from underrepresented groups in HIV/AIDS research through the Centers for AIDS Research. These centers support a multidisciplinary environment promoting basic, clinical, behavioral, and translational research in

the prevention, detection, and treatment of HIV/AIDS.

As part of the NIAID-sponsored Partners in Education Program, students are introduced to a scientific environment and are given the opportunity to see science in action, meet and consult with working scientists, gain practical experience by participating in laboratory work, and receive supplemental instruction. Since 1998, scientists from NIAID's Rocky Mountain Laboratories in Hamilton, Montana, have teamed with local middle and high schools to present the Biomedical Research After-School Scholars program. This program introduces students in grades 7 through 12 to the fundamentals and relevance of biomedical research to stimulate their interest in science and encourage them to pursue careers in biomedical research.

Conclusion

NIAID continues to strengthen its research on infectious and immunologic diseases that contribute to the health disparities experienced by diverse populations. The Institute also continues to enhance its programs that are designed to build a new cadre of researchers in the biomedical sciences. These efforts, along with NIAID's increased outreach to underrepresented groups and communities, continue to contribute toward NIAID's goal of ensuring that the Institute's research will benefit all Americans.

I. MINORITY HEALTH INITIATIVES

Allergy, Immunology, and Transplantation

The National Institute of Allergy and Infectious Diseases (NIAID), in its *Strategic Plan for Addressing Health Disparities* (http://www.niaid.nih.gov/healthdisparities/NIAID_HD_Plan_Final.pdf), identifies two main objectives to promote minority health research in the areas of allergy, immunology, and transplantation:

- ▶ Support basic and clinical research on immune-mediated diseases, including asthma and allergic diseases, autoimmune diseases, and rejection of transplanted organs, tissues, and cells, that will lead to a better understanding of these diseases and improved prevention and treatment strategies.
- ▶ Increase the number of underrepresented and disadvantaged groups in biomedical research through individual and institutional support for undergraduate, graduate, and postgraduate research training in a variety of disciplines related to immune-mediated diseases.

Asthma and Allergic Diseases

Approximately 54.3 percent of Americans have positive skin tests to at least 1 of 10 allergens that contribute to allergic illness.¹ Compared with white children of the same age, African American children have a higher prevalence of allergy to cockroaches, house dust mites, and molds (*Alternaria* spp.). Similarly, Mexican American children have a higher prevalence of allergy to cockroaches and house dust mites.²

Asthma affects more than 30 million Americans, resulting in more than 480,000 hospitalizations and approximately 4,200 deaths annually. African Americans are disproportionately affected by asthma. In 2002, the prevalence of asthma among non-Hispanic African Americans was approximately 30 percent higher than among non-Hispanic whites and nearly double that among Hispanics.

Among individual racial and ethnic groups, Puerto Ricans have the highest lifetime prevalence of asthma.³

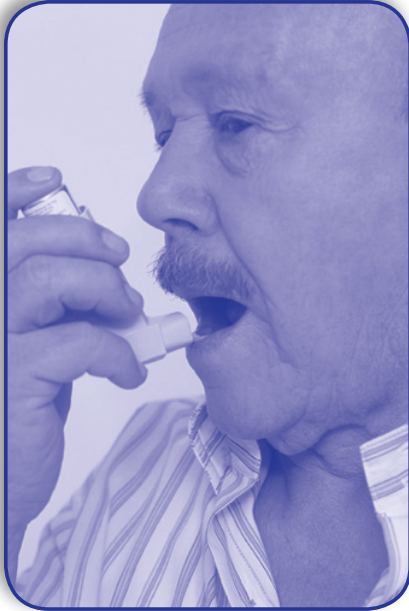
The disparity in the prevalence of asthma is also greater among African American children: in 2002, the prevalence of asthma was higher among African

American children younger than 18 years (76.8 per 1,000 population) than among white children (53.4 per 1,000 population) of the same age.⁴ In 1998, asthma accounted for an estimated \$12.7 billion in expenditures, including \$7.4 billion in direct medical expenditures and \$5.3 billion in indirect costs.⁵

Asthma is a long-term, generally progressive lung disease characterized by episodes of obstructed airways. The cellular infiltrates and inflammatory mediators of asthma are thought to be similar to those of other allergic diseases, but asthma mediators also appear to cause airway hyper-reactivity. Chronic inflammation of the airways is widely recognized as a key factor in the development of asthma, and as a result, anti-inflammatory medications have become a

Asthma and allergic diseases are among the major causes of illness and disability in the United States. Chronic allergic conditions can significantly decrease an individual's quality of life, a patient's well-being, an employee's productivity, and a student's school performance and attendance.

mainstay of asthma therapy. Many immune-based therapies are in the early stages of development or are being studied as investigational agents. However, much needs to be learned before the more promising immune-based approaches can be developed into licensed therapies.



Senior adult using an inhaler to control onset of asthma attack.

Although allergic reactions are an important cause of asthma, nonimmunologic factors (e.g., viral infections, exposure to environmental tobacco smoke and pollutants) also contribute to the pathophysiology of this disease. Promising findings offer new opportunities to initiate basic and clinical research aimed at clearly defining the early-life perturbations of the immune system that lead to the development of asthma.

The Inner-City Asthma Study, co-funded by NIAID and the National Institute of Environmental Health Sciences, was a multi-center, randomized controlled trial that tested the effectiveness of two interventions in reducing asthma morbidity among inner-city children with moderate to severe asthma:

- ▶ A physician feedback intervention, based on interviews with the child's caregiver, that provided physicians with a computer-generated letter containing up-to-date information on the child's recent asthma symptoms, medication use, and health care utilization.
- ▶ An environmental intervention aimed at reducing exposure to environmental triggers, including environmental tobacco smoke, cockroaches, house dust mites, mold, furry pets, and rodents. The study included 937 children between the ages of 5 and 10 years from seven inner cities. Participants were evaluated during the 1-year intervention period and for an additional year of follow-up after the intervention was completed.

The environmental intervention decreased exposure to indoor allergens, including cockroaches, house dust mites, and tobacco smoke, resulting in reduced asthma-associated morbidity.⁶

The Inner-City Asthma Consortium, established by NIAID in 2002, evaluates the safety and efficacy of promising immune-based asthma treatments developed to reduce asthma severity and prevent the onset of disease in inner-city children. The Consortium conducts research to determine the mechanisms of action of immune-based therapies and to understand the immunopathogenesis of asthma in inner-city children. The Consortium also develops and validates biomarkers to measure disease stage and progression and the effect of therapies. Current studies include the following:

- ▶ **Asthma Control Evaluation** is a randomized, prospective study to evaluate the use of measurement of exhaled nitric oxide, which increases during periods of uncontrolled asthma, as a surrogate marker for asthma worsening.
- ▶ **Urban Environment and Childhood Asthma** is a longitudinal prospective study in inner-city children of the immunologic causes of the development of recurrent wheezing, including evaluation of cytokine response patterns.
- ▶ **Inner-City Anti-IgE Therapy for Asthma** is a randomized, double-blind, placebo-controlled, parallel-group, multicenter trial to evaluate the safety and efficacy of omalizumab (Xolair) in inner-city children who have moderate to severe allergic asthma and whose symptoms are inadequately controlled with inhaled steroids. The Inner-City Asthma Consortium has also completed an ancillary study, the Cockroach Allergen Standardization Evaluation.

NIAID's Asthma and Allergic Diseases Research Centers program is the cornerstone of NIAID's research on the pathobiology of asthma and allergic diseases. This national network of

centers conducts basic and clinical research on the mechanisms, diagnosis, treatment, and prevention of asthma and allergic diseases. NIAID currently supports 15 Asthma and Allergic Diseases Research Centers. Ten clinical trials are currently in development at four sites.

In addition, NIAID initiated a pediatric allergy clinic on the National Institutes of Health (NIH) campus to serve as a focal point for patient-oriented research conducted in collaboration with NIAID laboratories. The NIAID team is enrolling up to 300 children with asthma and allergies from the Washington, DC, metropolitan area to gather data to characterize disease onset, progression, and remission. These patients will have the opportunity to participate in cutting-edge clinical research and to receive novel therapies.

NIAID established the Consortium of Food Allergy Research in fiscal year (FY) 2005 in response to a series of recommendations from an expert panel convened in 2003. The consortium conducts basic, clinical, and epidemiologic studies and develops educational programs aimed at parents, children, and health care providers. Projects include a study of the development and loss of tolerance to foods in a cohort of high-risk children and a clinical trial to evaluate a potential therapy for peanut allergy.

In FY 2005, NIAID and the National Heart, Lung, and Blood Institute co-sponsored an initiative that supports basic and clinical research projects to elucidate the underlying pathobiology of asthma exacerbations and mechanisms for their resolution. The goals of this program are to identify the impact of these processes on lung function and physiology during and after an exacerbation, as well as the relationship of exacerbations to future frequency and severity of exacerbation and disease progression. In response to provisions in the Children's Health Act of 2000 (PL 106-310), NIAID participates in the Federal Liaison Group for Asthma, a subcommittee of the National Asthma Education and Prevention Program.

Autoimmune Diseases

Autoimmune diseases are a family of more than 80 chronic and often disabling illnesses that develop when underlying defects in the immune system lead the body to attack its own organs, tissues, and cells. People with autoimmune diseases often endure loss of function, disability, hospitalizations, outpatient visits, decreased productivity, and impaired quality of life. Autoimmune diseases include systemic lupus erythematosus (SLE), type 1 diabetes, scleroderma, multiple sclerosis, Crohn's disease, Graves' disease, and rheumatoid arthritis. Collectively, autoimmune diseases afflict more than 5 percent of the U.S. population, and women are more likely to have an autoimmune disease than are men. Several autoimmune diseases, such as SLE and scleroderma, disproportionately affect minority populations.

SLE, commonly referred to as "lupus," is a chronic inflammatory disorder of the immune system in which the body produces antibodies that target the body's healthy cells and tissues. SLE affects 1 in 2,000 Americans with various degrees of severity. SLE is more common and more severe in African American women than in white women and is twice as prevalent among African American men as among white men. Reports also indicate an increased prevalence of SLE and rheumatoid arthritis among many American Indian and Alaska Native tribes.

NIAID supports a broad portfolio of basic, preclinical, and clinical research aimed at understanding the pathogenesis of autoimmune diseases. Researchers investigate new ways to modify the immune system and will apply this knowledge to the identification and evaluation of promising approaches to treat and prevent autoimmune diseases. Research programs include Autoimmunity Centers of Excellence (ACEs), Autoimmune Disease Prevention Centers, and multidisciplinary research targeting the identification, characterization, and definition of gender-based differences in the immune response.

The ACEs support collaborative basic and clinical research on autoimmune diseases, including pilot clinical trials of immunomodulatory therapies. The ACEs have been expanded to

include nine separate institutions. The centers bring together subspecialists (e.g., neurologists, gastroenterologists, rheumatologists) and basic scientists to increase clinical and research collaborations on autoimmunity. These centers conduct clinical trials to evaluate therapeutic interventions for several autoimmune diseases, including SLE.

Trials for new immunomodulatory interventions and studies of mechanisms of action are being developed. The ACEs are co-sponsored by the National Institute of Diabetes and Digestive and Kidney Diseases and the NIH Office of Research on Women's Health.

The Autoimmune Disease Prevention Centers conduct basic research on the development of new targets and approaches to prevent autoimmune diseases. In FY 2005, Autoimmune Disease Prevention Centers supported 22 pilot projects to test innovative approaches that may lead to the development of novel targets for disease prevention or assays for biomarkers of disease progression. In FY 2006, the Prevention Centers are being renewed to (1) create improved models of disease pathogenesis and therapy for use as validation platforms with which to test new tools applicable to human studies and (2) encourage core expertise and collaborative projects designed for rapid translation from animal to human studies, emphasizing the development of surrogate markers for disease progression and regulation. The prevention centers are co-sponsored by the National Institute of Diabetes and Digestive and Kidney Diseases, the National Institute of Child Health and Human Development, the Office of Research on Women's Health, and the Juvenile Diabetes Research Foundation International.

NIAID established the Sex-Based Differences in the Immune Response research initiative in 2001 to better understand differences in immune response between males and females. Research supported under this initiative will identify, characterize, and define sex-based differences in immune responses. Studies include basic and clinical investigations of sex differences that are regulated by hormonal and nonhormonal

mechanisms in response to exogenous antigens, the innate and adaptive immune response, and systemic and mucosal immunity. This initiative is co-sponsored by the National Institute of Neurological Disorders and Stroke, the National Institute of Arthritis and Musculoskeletal and Skin Diseases, the Office of Research on Women's Health, and the National Multiple Sclerosis Society.

NIAID continues to support the Immune Tolerance Network (ITN). Co-sponsored by the National Institute of Diabetes and Digestive and Kidney Diseases and the Juvenile Diabetes Research Foundation International, the ITN is an international consortium of more than 80 investigators throughout the United States, Canada, Europe, and Australia. Investigators are dedicated to the clinical evaluation of novel, tolerance-inducing therapies for autoimmune diseases, asthma and allergic diseases, and the development of tolerance-inducing therapies to prevent the rejection of transplanted organs, tissues, and cells. The ITN also explores immune tolerance and withdrawal of immunosuppression in kidneys and livers. The goal of tolerance-inducing therapies is to "re-educate" the immune system to eliminate injurious immune responses and graft rejection while preserving protective immunity against infectious agents. The ITN conducts integrated studies on the underlying mechanisms of approaches and develops and evaluates markers and assays to measure the induction, maintenance, and loss of tolerance in humans. (More information about the ITN is available at <http://www.immunetolerance.org>.)

NIAID is supporting three trials to evaluate autologous hematopoietic stem cell transplantation for the treatment of three autoimmune diseases: scleroderma, SLE, and multiple sclerosis. These complex trials, which opened in FY 2006, will also include studies of the underlying immune mechanisms of these diseases and treatments. (More information about NIH clinical research studies is available at <http://www.clinicaltrials.gov>.)

NIAID supports the Multiple Autoimmune Disease Genetics Consortium (MADGC),

a repository of genetic and clinical data and materials from families in which two or more individuals are affected by two or more distinct autoimmune diseases. MADGC provides materials to advance research aimed at discovering the human immune response genes involved in autoimmunity. MADGC has enrolled more than 363 families since May 2000. (More information about MADGC can be found at <http://www.madgc.org>.)

At the request of Congress, NIAID chairs the NIH Autoimmune Diseases Coordinating Committee (ADCC), which was established in FY 1998 to increase collaboration and facilitate coordination of research among NIH Institutes, Centers, and Offices; other Federal agencies; and private organizations and patient advocacy groups with an interest in these diseases. In March 2005, the ADCC submitted its third report to Congress. This report summarized FY 2003 NIH funding for autoimmune diseases research, as well as accomplishments and activities, including ongoing research projects and future initiatives that address components of the ADCC's Autoimmune Diseases Research Plan. The Research Plan, mandated in the Children's Health Act of 2000 (PL 106-310) and presented to Congress in 2002, highlighted opportunities to increase understanding of autoimmune diseases at the population, individual, and molecular levels, focusing on the underlying immune mechanisms that are common to many of these diseases. The plan provided recommendations for future research directions in the epidemiology and burden of autoimmune diseases; etiology and pathogenesis; diagnosis, treatment, and prevention; and training, education, and information dissemination. (The Autoimmune Diseases Research Plan can be found at http://www3.niaid.nih.gov/about/organization/dait/PDF/dec2002_ADCC.htm; the March 2005 report to Congress can be found at http://www3.niaid.nih.gov/about/organization/dait/PDF/ADCC_Final.pdf.)

Transplantation

The principal goal of transplantation is the physical and functional replacement of failing organs and tissues. However, disparities exist in organ transplantation. For example, African Americans are less likely to be identified as candidates for renal transplantation, often lack suitable donors, and tend to remain longer on transplant waiting lists than other groups. Although African Americans make up approximately 35 percent of patients on the renal transplant waiting list, the organ donation rate among African Americans is lower than that of other racial groups.

The most striking advances in transplantation have come in the past 30 years with improvements in surgical techniques and the development of immunosuppressive agents to inhibit a recipient's immune response against grafts. These advances have made transplantation the preferred treatment for many end-stage organ diseases. Today, transplantation procedures are performed with more than 25 different organs and tissues, and first-year graft survival rates often exceed 80 percent.

Despite these successes, two major impediments remain: immune-mediated graft rejection and the critical shortage of donor organs. The primary reason for graft failure is a recipient's vigorous immune response to the graft. Improvements in immunosuppressive therapy have dramatically increased graft survival for all organs during the first year after transplantation. Long-term graft survival, however, has not improved significantly in the past two decades, owing to chronic graft failure. The mechanisms of chronic graft failure differ from those of acute rejection and are less well understood.

Immune-Mediated Graft Rejection

Although advances in surgical procedures and immunosuppressive therapies have greatly increased, 1-year graft survival rates for all organs and tissues and long-term graft survival are relatively unchanged. NIAID supports a broad portfolio of research to address immune-

mediated graft rejection, including basic research in transplantation immunology, preclinical evaluation of new therapies, and clinical trials of promising therapeutic approaches to improve short- and long-term graft survival. The major goals of transplantation research are to:

- ▶ Understand the pathways whereby the immune system recognizes transplanted organs, tissues, and cells
- ▶ Characterize the cellular and molecular components of acute rejection and chronic graft failure
- ▶ Evaluate novel therapies for treating rejection and prolonging graft survival in preclinical models
- ▶ Develop and implement strategies for immune tolerance induction
- ▶ Conduct clinical trials of new therapies to improve graft survival while minimizing the toxic side effects of immunosuppressive drugs

Kidney transplantation accounts for 59 percent of all solid-organ transplant procedures and is the preferred therapy for end-stage renal disease.⁷ In 2003, NIAID renewed the Cooperative Clinical Trials in Pediatric Transplantation program. The program supports multicenter clinical trials of novel approaches to prevent acute and chronic graft rejection in pediatric kidney transplantation, evaluates modifications of immunosuppressive drug regimens to mitigate unwanted side effects of immunosuppression, and assesses pre-transplant immunotherapy to improve transplantation outcomes. Clinical trials that continue to accrue subjects include:

- ▶ a study comparing the immunosuppressive drug sirolimus with the standard treatment for chronic graft failure,
- ▶ a study of the effects of steroid withdrawal in pediatric transplant recipients,
- ▶ an evaluation of intravenous immunoglobulin as an agent to reduce

existing immunity to potential donor organs, and

- ▶ a study of transplantation for high-risk candidates for kidney transplant.

The program conducts mechanistic studies to determine the effect of these interventional approaches on the immune system. The mechanistic studies have led to novel approaches for noninvasive diagnosis of acute rejection, as well as innovative approaches for detecting T cells that may regulate the immune response to grafts.

Patients with HIV infection and/or AIDS are at significant risk for end-stage organ disease. Before the advent of highly active antiretroviral therapy (HAART), HIV-positive patients often were not considered for transplants on the basis of poor prognosis. HAART has significantly increased the number of HIV-positive patients with end-stage kidney or liver disease who are potential candidates for transplantation. NIAID's Division of Allergy, Immunology, and Transplantation and Division of AIDS launched a study on the outcomes of kidney or liver transplantation for HIV-positive patients in 2003. The primary aim of this prospective, multicenter cohort study is to evaluate the safety and efficacy of solid-organ transplantation in HIV-positive patients who undergo kidney or liver transplantation. Seventeen participating centers are currently enrolling subjects in this trial.

Despite substantial improvements in short-term graft survival, long-term graft survival remains poor, primarily because of chronic graft failure. In 2001, NIAID and the National Heart, Lung, and Blood Institute renewed the Immunopathogenesis of Chronic Graft Rejection Program, which is designed to enhance knowledge about chronic graft failure. Little is known about the etiology of chronic graft failure, including the factors that determine its onset and severity, the targets of immune reactivity, and the factors that control the degree of variability in the rejection process among patients. The Immunopathogenesis of Chronic Graft Rejection Program will enhance understanding of both the immunologic and nonimmunologic mechanisms

that underlie chronic graft rejection, improve diagnostic criteria to predict graft failure, and identify novel approaches for clinical intervention.

NIAID, in collaboration with the National Institute of Diabetes and Digestive and Kidney Diseases and the National Heart, Lung, and Blood Institute, also supports the Clinical Trials in Organ Transplantation Program. The goal of this cooperative, multi-site consortium is to develop and implement interventional and observational clinical studies, accompanied by mechanistic studies, designed to enhance the understanding of, and ultimately reduce, the immune-mediated morbidity and mortality of organ transplantation. The Clinical Trials in Organ Transplantation, supports research to accomplish the following:

- ▶ Evaluate new therapeutic regimens to overcome immunologic barriers to graft acceptance and long-term graft and patient survival
- ▶ Evaluate approaches to the treatment and prevention of immune-mediated complications of transplantation
- ▶ Investigate the underlying mechanisms of the pathologic processes, agents, or regimens under study
- ▶ Develop diagnostic tests and surrogate biomarkers that will facilitate routine surveillance, early diagnosis, and ongoing monitoring of the processes that contribute to posttransplant morbidity and mortality

Histocompatibility and Immunogenetics

The human leukocyte antigen (HLA) gene complex is the most polymorphic region of the human genome and consists of more than 200 genes of known and unknown function. Products of these genes control the immune response to allografts, pathogens, and tumors and are associated with several autoimmune diseases,

including type 1 diabetes and rheumatoid arthritis. In renal and hematopoietic stem cell transplantation, accurate HLA matching of the donor and recipient is associated with improved clinical outcome.

NIAID, with co-sponsorship from the National Institute of Neurological Disorders and Stroke, launched the HLA-Region Genetics in Immune-Mediated Diseases program in FY 2005. The objective of this program is to define the association between HLA-region genes or genetic markers and immune-mediated diseases, including risk and severity of disease, and organ and cell transplantation outcomes. The program is sponsoring a grant for research on SLE and African American women, as well as other grants for the study of SLE, rheumatoid arthritis, multiple sclerosis, and myasthenia gravis. The program will support basic and clinical research on the genetics of the HLA complex. Research projects will address the following areas:

- ▶ Evolution and diversity of HLA genes
- ▶ Correlation of transplant outcome with the level of donor-recipient HLA matching at the allele level
- ▶ Association of HLA alleles with immune-mediated diseases
- ▶ Discovery of new genes in the HLA gene complex

This project will continue research efforts to characterize the diversity of genes of the HLA region and their role in health and disease.

Donor Organ Shortage

In 2006, a total of 28,932 organ transplants were performed in the United States, including transplants of 17,093 kidneys, 6,650 livers, 2,192 hearts, 462 pancreata, 1,405 lungs, 175 intestines, 31 heart-lung combinations, and 924 kidney-pancreas combinations.⁸ The limited availability of donor organs is the main factor that restricts the number of transplantation procedures performed each year in the United

States. The waiting list for transplants has more than quadrupled since 1988 to more than 100,000 patients.⁹ NIAID supports efforts to increase organ donation by improving donor registries and developing and testing educational interventions. Efforts to increase organ donation emphasize the involvement of African Americans and other underrepresented minority populations that are at greater risk of end-stage renal disease.

Microbiology and Infectious Diseases

The microbiology and infectious diseases segment of NIAID's scientific agenda includes intramural and extramural research to control and prevent diseases in humans caused by virtually every infectious agent. NIAID supports a wide

spectrum of projects ranging from basic biomedical research (e.g., studies of microbial physiology and antigenic structure) to applied research (e.g., developing diagnostic tests and clinical trials to evaluate potential drugs and vaccines).

Tuberculosis

Starting in 1992, a large influx of Federal funds and a renewed emphasis on TB therapy, prevention, and control have led to a decline in TB cases and death rates in the United States. During 2006, a total of 13,767 TB cases across the United States

were reported to the Centers for Disease Control and Prevention (CDC). This number represents a 3.2 percent rate of decline from 2005.¹¹ Although the overall rate of new TB cases continues to decline in the United States since national

reporting began in 1953, the rates of decline for 2003 (2.3 percent) and 2005 (2.9 percent) were the smallest since 1993.¹²

Despite apparent progress in the reduction of TB incidence and prevalence in the United States over the past decade, national declines in TB incidence mask substantial disparities between rates in the majority of U.S. residents and those in minority populations. Populations most affected by TB in the United States include minorities born in the United States and foreign-born individuals of many different racial and ethnic backgrounds who come from countries where TB remains a significant public health problem.

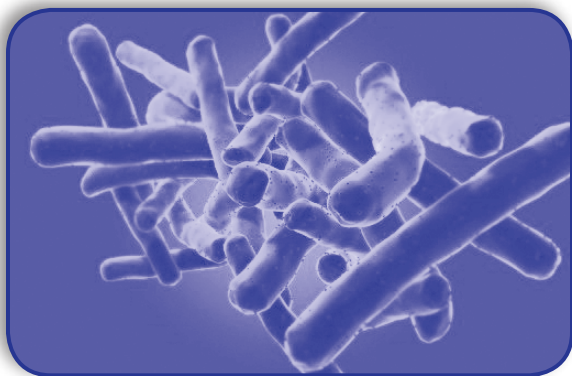
A combination of factors is responsible for the disproportionate impact of TB on minorities and people born outside of the United States. Individuals emigrating from countries where TB is endemic may harbor *M. tuberculosis* infection or may already have active TB disease when they move to the United States. In addition, urban poverty, high HIV infection rates, and the effects of household overcrowding may contribute to the disproportionately high number of TB cases in minority and immigrant populations.

In 2006, U.S. minority populations had TB rates that were significantly higher than the overall U.S. average. The 2006 TB case rate among Asians (25.6 cases per 100,000 population) was nearly 22 times higher than that among whites (1.2 cases per 100,000 population); blacks (10.1 cases per 100,000 population) and Hispanics (9.2 cases per 100,000 population) each had rates approximately 8 times higher than that of whites.¹³ In 2006, for the third consecutive year in terms of absolute numbers of cases, there were more reported cases of TB among Hispanics than in any other ethnic group in the United States.¹⁴ This divergent trend was the result of a 3.6 percent increase in the U.S. Hispanic population between 2003 and 2004.¹⁵ However, the TB rate among Hispanics in the United States decreased slightly, from 9.5 cases per 100,000 population in 2005 to 9.2 cases per 100,000 population in 2006.

A century ago, tuberculosis (TB) was a leading cause of death in the United States. Approximately one-third of the world's population is thought to be infected with *Mycobacterium tuberculosis*, the causative agent of TB.¹⁰ Due to the efforts of physicians, researchers, and public health officials, as well as improvements in living conditions and the introduction of effective drug therapies, the number of TB cases and deaths in the United States declined steadily from the early 20th century until 1985, when the rate began to rise again. This increase was due to several factors, including the HIV epidemic, which resulted in a large population of immunocompromised individuals who were susceptible to infectious diseases.

Foreign-born persons also continue to be affected disproportionately by TB in the United States. In 2006, the TB rate among foreign-born individuals (21.9 per 100,000 population) was more than 9 times the rate among persons born in the United States (2.3 per 100,000 population). Although the TB rate among U.S.-born persons has declined by 68.6 percent since 1993, the rate among foreign-born persons has decreased by far less—only 35.8 percent—during the same time period.

The emergence of multidrug-resistant and extensively drug-resistant TB is related to higher rates of TB among foreign-born individuals in the United States and has made it very difficult to treat and control the transmission of TB in some parts of the world. Drug resistance has arisen in large part due to patients' not completing the full course of standard therapy, which has a long duration and often unpleasant associated side effects. Although the number of cases of multidrug-resistant TB has declined sharply in the United States over the past decade, this form of the disease has disproportionately affected foreign-born individuals. According to the CDC, previous data suggest that U.S.-born and foreign-born TB patients in the United States are similar in their rates of TB treatment completion. The greater proportion of cases of multidrug-resistant TB among foreign-born individuals is therefore probably the result of TB infection in the person's country of origin, where rates of infection with the multidrug-resistant strain are higher than in the United States.^{16,17}



Stylized image of *Mycobacterium tuberculosis* (*M.tb*), the pathogen that causes TB.

NIAID is supporting research to help fight TB among both domestic and global populations by developing a solid knowledge base about the disease and its pathogen and translating this knowledge base into new tools and medicines for improved diagnosis, treatment, and prevention. Many candidate vaccines have been screened for protective efficacy in animals, new drugs are being examined that may lead to shorter terms of antibiotic treatment, and innovative programs have been developed that promote international collaboration among investigators.

One such program is the Tuberculosis Research Unit (TBRU), a cornerstone of NIAID's global fight against TB that was originally established through a contract with Case Western Reserve University in 1994. The goal of the TBRU is to create a multidisciplinary, international team dedicated to TB clinical research. This contract was re-competed, and Case Western Reserve University received a third contract award in May 2007. The TBRU will focus on the following critical research areas, which will have a major impact on TB in populations most affected by this disease:

- ▶ Why do most HIV-negative persons successfully control *M. tuberculosis* infection, whereas some progress to active disease?
- ▶ Why does Bacille Calmette-Guérin (BCG), a vaccine against TB, protect some individuals and not others from TB disease, and what are the kinetics of the immune response after vaccination with BCG versus after infection with *M. tuberculosis*?
- ▶ What immune responses or other biological markers that predict relevant clinical outcomes can be measured in response to drug therapy or vaccines?

Although most NIAID-funded TB research is focused on aspects of disease and interventions that are applicable to all TB-affected populations around the world, NIAID is also supporting directed epidemiological studies that are specifically focused on issues relevant to North American Hispanic populations. These studies are

examining variables such as which strains of *M. tuberculosis* are circulating in these populations, risk factors for disease, routes of TB transmission, and effectiveness of interventions.

Sexually Transmitted Infections Other Than HIV/AIDS

Sexually transmitted infections (STIs) other than HIV/AIDS are critical global and national health priorities because of their devastating impact on women and infants and their inter-relationships with HIV/AIDS. Infection with certain STIs can increase the risk of HIV acquisition and transmission and can alter the progression of the disease. STIs can also cause long-term health problems, particularly in women and infants. Some of the sequelae of STIs include pelvic inflammatory disease, infertility, ectopic (tubal) pregnancy, cervical cancer, and perinatal or congenital infections in infants born to infected mothers. Several STIs, such as chlamydia, gonorrhea, syphilis, trichomoniasis, and bacterial vaginosis, have higher incidences among minorities than among whites in the United States:

- ▶ In 2005, the rate of chlamydia among African American females in the United States (1,729.0 per 100,000) was more than 7 times higher than that among white females (237.2 per 100,000). The rates of chlamydia among American Indians/Alaska Natives (748.7 per 100,000) and Hispanics (459.0 per 100,000) were nearly 5 and 3 times higher, respectively, than that among whites (152.1 per 100,000).¹⁸
- ▶ Gonorrhea rates in 2005 were highest for African American females among all racial, ethnic, and age categories in the United States. Among 15- to 19-year-old African American women in 2005, the gonorrhea rate (2,814.0 per 100,000) was the highest rate of any group. Rates among American Indians/Alaska Native (131.7) and Hispanic populations (74.8) were more than 3 and 2 times greater, respectively, than that among whites (35.2).¹⁹

- ▶ In 2005, rates of primary and secondary syphilis reported among African Americans (9.8 per 100,000) were more than 5 times higher than that among non-Hispanic whites (1.8 per 100,000 population).²⁰

- ▶ Epidemiologic studies suggest that trichomoniasis is 1.5 to 4.0 times more common among African Americans than among other racial/ethnic groups.²¹

- ▶ In the United States, as many as 16 percent of pregnant women have bacterial vaginosis. This varies by race and ethnicity, from 6 percent in Asians and 9 percent in whites to 16 percent in Hispanics and 23 percent in African Americans.²²

NIAID supports individual investigator-initiated research grants and a variety of research programs for the development of more effective prevention and treatment approaches to control STIs.²³ Research efforts include developing and licensing vaccines, topical microbicides, and treatments for STIs; understanding the long-term health impacts of sexually transmitted pathogens in various populations; stimulating basic research on the pathogenesis, immunity, and structural biology of these pathogens; and developing better and more rapid diagnostics.

NIAID has also created an extensive infrastructure for conducting basic and applied research on STIs, including the STI and Topical Microbicides Cooperative Research Centers, the STI Clinical Trials Group, and the Partnerships for Topical Microbicides Program projects. These activities are part of an overall Institute effort to initiate and support a variety of other research projects that focus on the following:

- ▶ Developing vaccines, topical microbicides, and treatments for the microbes that cause STIs
- ▶ Developing better and more rapid diagnostics
- ▶ Sequencing the genomes of sexually transmitted pathogens

- ▮ Understanding the long-term health impact of sexually transmitted pathogens in various populations

In addition, NIAID supports several clinical and epidemiological studies that focus on STIs in minority populations. The goals of these studies include identifying risk factors for STIs in minority populations, examining the relationship of STIs to infertility and pregnancy outcomes, and evaluating the effectiveness of prevention and control strategies in minority communities.

NIAID also supports training of underrepresented groups of scientists in the area of STI research. Through a collaborative training program with the Sexually Transmitted Disease Cooperative Research Center, NIAID supports a research program with second-year medical students from Howard University in Washington, DC. This program provides students with 10 weeks of STI research experience at the Cooperative Research Center with the long-term objective of encouraging young physicians to pursue careers in STI research.

Hepatitis C

Hepatitis C virus (HCV) infection is the most common chronic blood-borne viral infection in the United States. An estimated 4.1 million (1.6 percent) Americans have been infected with HCV, of whom 3.2 million are chronically infected.²⁴ New infections in the United States continue at the rate of approximately 30,000 cases per year.²⁵ According to the CDC, in 2005 most cases of HCV occurred among adults, and injection drug use was the most common risk factor. The decline in the incidence of acute hepatitis C since the late 1980s has been primarily attributed to a decrease in its incidence among injection drug users, possibly related to risk reduction practices among injection drug users.²⁶

Progress has been made in reducing disparities in race/ethnicity-specific rates in the last decade. According to CDC surveillance, in 2005 the incidence of acute hepatitis C was similar across

all U.S. racial/ethnic populations, including whites, American Indians/Alaska Natives, Asians/Pacific Islanders, Hispanics, and blacks. However, racial/ethnic disparities in HCV prevalence were demonstrated by the higher rate of chronic infection among non-Hispanic blacks than among other racial/ethnic populations.²⁷

NIAID has a robust program in HCV research that includes efforts to:

- ▮ Understand HCV transmission modes to develop effective intervention strategies
- ▮ Understand HCV pathogenic mechanisms and disease progression to develop effective treatments
- ▮ Characterize host immune responses to HCV infection to develop vaccines and prophylactic and therapeutic measures
- ▮ Develop noninvasive methods to evaluate current disease state, to predict outcomes, and to prevent or reverse disease progression
- ▮ Evaluate HCV vaccines and therapeutics in model systems and human clinical trials

One of the cornerstones of NIAID's HCV effort is the Hepatitis C Cooperative Research Centers, which were launched in 1996 as basic and clinical research units devoted to understanding HCV infection and disease processes. The goals of the Centers are to identify the components of HCV, isolate the body's immune response to the virus, determine the individual genetic factors that have a crucial impact on recovery from initial and chronic infection, track disease progression and severity, and determine how cofactors influence HCV disease. Clinical research emphasizes studies in special populations (e.g., African Americans) that are heavily affected by HCV but respond poorly to standard therapies.

Specifically, one of the HCV Cooperative Research Centers is conducting a therapeutic clinical trial examining the use of pegylated interferon and ribavirin in parallel cohorts of African Americans and whites. The goal of

this clinical trial is to determine what causes disparities between African Americans and whites in their response to standard therapy.

Another HCV Cooperative Research Center is conducting an epidemiological study of the relationships between HCV replication, evolution, and disease progression in Alaska Natives. This well-defined and well-monitored study may provide many key answers regarding the natural history of hepatitis C and may affect the future treatment of hepatitis C worldwide.

HIV/AIDS

Since the emergence of HIV/AIDS as a deadly global infectious disease in 1981, considerable progress has been made in understanding its impact on the immune system and how to prevent and treat infection. Despite the scientific advances that have been made in its treatment, HIV/AIDS continues to rage around the world. According to the Joint United Nations Programme on HIV/AIDS, 38.6 million people were estimated to be living with HIV/AIDS and 2.8 million people died from AIDS worldwide in 2006.²⁸ In addition, 4.1 million people became newly infected with HIV in 2006, including 530,000 children age 15 years and younger.²⁹ More than 980,000 cases of AIDS have been reported in the United States since the epidemic was identified in 1981. At the end of 2005, more than 470,000 persons in the United States were known to be living with AIDS, and more than 200,000 were living with HIV infection (not AIDS).³⁰

In the United States, HIV/AIDS affects all racial and ethnic groups but is disproportionately found among minority populations:³¹

- ▶ African Americans and Hispanics constituted 56 percent of the AIDS cases through 2005. Although African Americans comprise only 12 percent of the U.S. population, they make up almost 40 percent of all AIDS cases reported in the United States. Similarly, Hispanics make up 13 percent of the U.S. population but represent 16 percent of all AIDS cases.
- ▶ Of the new AIDS cases reported in 2005, 48 percent were among African Americans, 18 percent were among Hispanics, 28 percent were among whites, 1.2 percent were among Asians/Pacific Islanders, and less than 1 percent were among American Indians/Alaska Natives.
- ▶ Among women living with HIV/AIDS, African Americans and Hispanics accounted for 79 percent of AIDS cases (64 percent and 15 percent, respectively) in 2005.
- ▶ Among men living with HIV/AIDS, African Americans and Hispanics accounted for 59 percent of AIDS cases (41 percent and 18 percent, respectively) in 2005.

Minority children in the United States are also disproportionately affected by AIDS. Of the 68 pediatric AIDS cases reported in 2005, 46 (67.6 percent) were in African American children and 13 (19.1 percent) were in Hispanic children. Cumulatively, of the 9,101 cases of AIDS in children under 13 years of age from 2001 through 2005, 5,631 (61.9 percent) were in African American children and 1,738 (19.1 percent) were in Hispanic children.³²

CDC reported 17,011 deaths from AIDS in the United States in 2005, of which 8,562 (50.3 percent) were in African Americans, 2,444 (14.4 percent) were in Hispanics, 5,006 (29.4 percent) were in whites, 97 (0.6 percent) were in Asians/Pacific Islanders, and 81 (0.5 percent) were in American Indians/Alaska Natives.³³

The disproportionate impact of the HIV/AIDS epidemic on minority populations is seen more clearly by comparing the rates of infection between specific groups. Rates of infection are quantified as the number of cases per 100,000 people. The rate of HIV/AIDS cases in 2005 was 8.8 among whites, 71.3 among African Americans, 27.8 among Hispanics, 7.4 among Asians/Pacific Islanders, and 10.4 among American Indians/Alaska Natives.³⁴

HIV transmission due to injection drug use continues to be a significant factor in the spread

of HIV/AIDS in minority communities. Among men infected with HIV in 2005, 9 percent of African Americans, 22 percent of Hispanics, 2 percent of Asians/Pacific Islanders, 11 percent of American Indians/Alaska Natives, and 6 percent of whites reported injection drug use as a potential route for exposure. Among women infected with HIV in 2005, injection drug use was reported as a potential exposure route for HIV by approximately 8 percent of African Americans, 16 percent of Hispanics, 3 percent of Asians/Pacific Islanders, 17 percent of American Indians/Alaska Natives, and 22 percent of whites.³⁵

A large proportion of women (40 percent) become infected with HIV through heterosexual contact. Another factor contributing to the spread of HIV in minority communities is male-to-male sexual contact. This accounted for 40 percent of HIV infections in African American men and 44 percent in Hispanic men in 2005.³⁶

As the HIV/AIDS epidemic continues to expand in minority communities, enrolling minority patients in HIV/AIDS clinical trials is particularly urgent to ensure that research results are applicable to all populations affected by the disease. People of minority backgrounds face unique social, economic, and medical issues when coping with the challenges associated with HIV/AIDS infection, and therefore, one of the greatest challenges facing HIV/AIDS researchers today is the recruitment and retention of minority patients for clinical trials. To ensure that enrollment reflects the national epidemic, NIAID has taken strong steps to encourage diversity in its volunteers for clinical trials, natural history studies, and prevention studies.

NIAID works with communities to identify and overcome barriers to participation in clinical trials. Outreach is accomplished through the development of culturally sensitive education materials and provision of additional resources, such as child care and transportation, that enhance participation in NIAID-sponsored trials. NIAID has also taken a leadership role in involving community representatives in local, national, and international research activities.

Encouraging community members to play an active role in all aspects of research facilitates communication and helps ensure that new HIV/AIDS treatment and prevention strategies address areas of utmost concern to those affected by the disease. NIAID's HIV/AIDS clinical research networks provide opportunities for community representatives to participate in the research process through local, national, and international Community Advisory Boards. Research trials will be conducted to advance the body of scientific knowledge that will improve the diagnosis, treatment, and development of preventive strategies for women and minorities.

Therapeutics

Researchers have identified powerful antiviral therapies to treat HIV/AIDS. These highly active antiretroviral therapies (HAART) can suppress the virus to undetectable levels in the blood and delay disease progression and death. Since the widespread introduction of HAART, the number of deaths in persons with HIV/AIDS has dropped dramatically in the United States and other developed countries. HIV-infected individuals live longer as a result of HAART, but many experience a host of complications from the complex therapeutic regimen. These complications include the development of drug resistance and metabolic abnormalities and toxicities. In addition, the complexity of the HAART regimen often results in patients' noncompliance.

NIAID directs a large HIV/AIDS therapeutics clinical trials program consisting of three networks: the AIDS Clinical Trials Group (ACTG), International Maternal Pediatric Adolescent AIDS Clinical Trials (IMPAACT), and International Network for Strategic Initiatives in Global HIV Trials (INSIGHT). The ACTG investigates therapeutic interventions for translational research and drug development; optimization of clinical management, including co-infections and co-morbidities; vaccine research and development; prevention of mother-to-child transmission of HIV; and prevention of HIV infection.³⁷ IMPAACT develops and

evaluates safe and cost-effective approaches for the interruption of mother-to-infant transmission; evaluates treatments for HIV-infected children, adolescents, and pregnant women, including treatment and prevention of co-infections and co-morbidities; and evaluates vaccines for the prevention of HIV sexual transmission among adolescents.³⁸ INSIGHT evaluates clinical interventions for optimizing treatment (antiretroviral and immunomodulatory therapies as well as interventions to prevent and treat complications of HIV and antiretroviral therapies) to prolong disease-free survival in a demographically, geographically, and socioeconomically diverse population infected with HIV.³⁹

ACTG, IMPAACT, and INSIGHT will strive to ensure that a sufficient proportion of diverse individuals are enrolled in clinical trials. (More information about ACTG is available at <http://www.aactg.org/>; about IMPAACT at <http://pactg.s-3.com>; and about INSIGHT at <http://www.insight-trials.org>.)

Vaccine Development

NIAID continues to support efforts to develop an effective HIV vaccine for use around the world. As promising candidates move farther in the vaccine pipeline, expanded clinical trials will become increasingly important, especially in populations at increased risk for HIV infection. To date, NIAID has supported 99 vaccine trials (84 Phase I, 12 Phase II, 2 Phase IIb, 1 Phase III) involving 55 different products, 22 adjuvants, and more than 26,000 volunteers. Currently, NIAID is supporting 20 vaccine trials (13 Phase I, 4 Phase II, 2 Phase IIb, 1 Phase III).

Established in 2000, the HIV Vaccine Trials Network (HVTN) fosters the development of HIV vaccines through testing and evaluating candidates in a global network of domestic and international clinical sites. Building on the previous accomplishments of NIAID's AIDS Vaccine Evaluation Group and the HIV Network for Prevention Trials (HIVNET), the HVTN's global capacity allows for rapid expansion and the

ability to perform large-scale studies of suitable vaccines as more vaccine candidates enter the pipeline for testing and development.

The participation of international sites and the involvement of ethnically diverse populations in HVTN studies are critical components of NIAID's HIV/AIDS vaccine effort. HVTN's broad participation allows researchers to design studies that examine the factors that are crucial to developing an effective vaccine for use around the world. These factors include genetic background, nutritional status, effects of co-infection, and access to health care. HVTN's international capacity also facilitates studies of HIV/AIDS subtypes, which affect a small portion of the global population. Studying HIV/AIDS subtypes is an important aspect of developing a vaccine that will protect individuals from the various circulating strains of HIV/AIDS.

In addition to conducting clinical studies, HVTN develops community outreach programs to educate people about HIV/AIDS and vaccine research. Through outreach, HVTN seeks to encourage participation in clinical trials and enroll a diverse population, emphasizing the recruitment of minorities and women. In 2006, 19 percent of participants in HVTN studies were African Americans, 6 percent were Hispanics, 2 percent were Asians/Pacific Islanders, and less than 1 percent were American Indians/Alaska Natives. (More information about these trials is available at <http://www.hvtn.org>.)

NIAID is also actively involved in educating the public about HIV vaccine research through the NIAID HIV Vaccine Education Initiative (NHVREI), formerly the HIV Vaccine Communications Campaign. Targeting at-risk populations, in particular African Americans, Hispanics, men who have sex with men (MSM), and high-risk women, NHVREI implements a national education campaign to increase awareness of and support for HIV vaccine research, especially in at-risk populations. Specifically, the NHVREI is designed to:

- ▶ Increase awareness of the urgent need for an HIV vaccine within the communities that are most affected by HIV/AIDS
- ▶ Create a supportive environment for current and future volunteers in HIV vaccine trials
- ▶ Improve the public's perceptions and attitudes toward HIV vaccine research

Through the NHVREI, NIAID is developing the Local Partnership Program (LPP), which aims to:

- ▶ Increase knowledge and awareness about HIV vaccine research in targeted communities
- ▶ Foster more positive attitudes about HIV vaccine research so that communities are more supportive of and receptive to HIV vaccine trial volunteerism
- ▶ Increase the capacity of communities to conduct awareness and educational activities

Each LPP partner focuses its efforts in the communities that it serves, including African Americans, Hispanics, MSM, and high-risk women. NHVREI plans to make LLP awards to local community-based organizations in areas where NIAID conducts HIV vaccine research. These LPP awardees will coordinate with local NIAID-sponsored HIV Vaccine Trial Units and NIAID's Vaccine Research Center to strengthen collaborative efforts and build the capacity of community-based organizations to conduct HIV vaccine awareness and education activities.

The NHVREI continues to facilitate activities that commemorate HIV Vaccine Awareness Day (HVAD), which is May 18th. For each HVAD, HIV vaccine messages are delivered to the NHVREI's primary audiences (African Americans, Hispanics, MSM, and high-risk women) and secondary audiences through newspaper and magazine public service announcements, online ads and Web sites, and support for LPP partners' HVAD activities in their local areas. (More information about

HVAD is available at <http://www3.niaid.nih.gov/news/events/HVAD>.)

NIAID also conducted an assessment of HIV vaccine research attitudes, awareness, and knowledge among adults in the general U.S. population, African Americans, Hispanics, and MSM. Results of focus groups and a media content analysis were used to design and conduct a survey to validate key HIV vaccine research themes and messages. Survey findings include the following:⁴⁰

- ▶ Although the majority of each population believes that a preventive HIV vaccine is the best way to control and end the global AIDS epidemic, only 35 percent of African Americans and 29 percent of the general population would be supportive if someone they know were to volunteer for an HIV vaccine trial.
- ▶ Forty-seven percent of African Americans, 27 percent of Hispanics, and 13 percent of MSM incorrectly believe that an HIV vaccine already exists and is being kept secret.
- ▶ Seventy-eight percent of African Americans, 58 percent of Hispanics, and 68 percent of MSM either could not say whether the vaccines being tested could cause HIV infection, or incorrectly believed that the vaccines being tested could cause HIV infection.
- ▶ A subanalysis of the general population also found that women were generally less knowledgeable than men about HIV vaccine research.

Awareness of and attitudes toward HIV vaccine research vary by population, and these issues must be addressed to ensure an adequate number of volunteers for future domestic HIV preventive vaccine clinical trials. In some populations, barriers such as misinformation and distrust must be targeted to increase support for HIV vaccine research.

The NIAID Vaccine Research Center (VRC) conducts research facilitating the rigorous pursuit of effective vaccines against HIV and other human diseases. Developing preventive HIV vaccines is the highest priority of the Center, which actively recruits volunteers to participate in Phase I clinical trials. Outreach and education about HIV vaccines is also an important component of the program. It is in this capacity that the VRC strives to reach out to minority communities to ensure that diverse communities have knowledge about and access to these clinical trials. The VRC has developed an AIDS vaccine strategy in which one vaccine is used for priming vaccinations and a second type of vaccine is used for booster vaccination. (More information about the VRC is available at <http://www.niaid.nih.gov/vrc>.)

Prevention

Preventing the transmission of HIV is an important aspect of HIV/AIDS research activities. In an effort to reduce the worldwide spread of HIV, NIAID established the HIV Prevention Trials Network (HPTN) and the Microbicides Trials Network to develop nonvaccine strategies to prevent HIV infection.

The HPTN is a global network of clinical trial sites in the United States and around the world. The network explores a variety of nonvaccine prevention strategies to reduce HIV/AIDS transmission, such as testing and developing biomedical and behavioral intervention programs. Because HIV/AIDS can be transmitted through a number of different routes, developing a variety of HIV/AIDS prevention strategies will have a significant impact on reducing transmission rates and slowing the worldwide spread of HIV/AIDS. In 2006, 34 percent of participants in HPTN studies were African Americans, 12 percent were Asians/Pacific Islanders, and 1 percent were American Indians/Alaska Natives. The HPTN is also co-sponsored by the National Institute of Child Health and Human Development, the National Institute on Drug Abuse, and the National Institute of Mental Health.

HPTN evolved from HIVNET, a program that conducted Phase I, II, and III clinical trials at U.S. and international sites. Building on HIVNET's many accomplishments, HPTN continues to expand the multidisciplinary research agenda established by HIVNET. HIVNET's accomplishments include the identification of nevirapine as an effective, affordable drug for preventing mother-to-child transmission of HIV/AIDS in developing countries and the establishment of the initial safety and acceptability of two new nondetergent microbicides.

The HPTN scientific agenda is divided into four main areas of research:

1. Use of antiretroviral drugs to reduce HIV transmission (in partnership with the ACTG)
2. Control and prevention of STIs to reduce HIV transmission
3. Treatment of substance abuse, particularly the use of injection drugs and stimulants such as cocaine and methamphetamines, to reduce HIV transmission
4. Application of behavioral change modalities to reduce HIV transmission

Educating communities about HIV/AIDS prevention trials and building community trust has been an important and crucial aspect of HPTN outreach. HPTN invites community members to participate in developing its scientific agenda to promote information exchange and ensure that social, cultural, and political values are respected. Community members discuss study designs, recruitment plans, volunteer incentives, informed-consent requirements, risk-reduction strategies, and research findings. Each HPTN site also has a community educator who assists community members in understanding the science of HIV/AIDS, the research methods that will be used, and the clinical trial process. Community educators build community trust by creating open forums allowing for candid conversations about community fears and concerns related to government-sponsored

research. (More information about HPTN studies is available at <http://www.hptn.org>.)

In 2006, NIAID established the new Microbicides Trials Network (MTN) for the development and evaluation of topical microbicides, which are gels, creams, and foams that can help prevent the sexual transmission of HIV in women. The MTN anticipates conducting more than 15 scientifically rigorous and ethically sound clinical trials in Africa, India, and the United States over the next 7 years. Domestic and international clinical research sites participating in the MTN will recruit a diverse group of participants for microbicide studies. The MTN also seeks the participation and collaboration of representatives of diverse scientific disciplines related to HIV prevention, as well as from the lay communities where MTN trials are being conducted. The MTN is co-sponsored by the National Institute of Child Health and Human Development, the National Institute on Drug Abuse, and the National Institute of Mental Health. (More information about MTN studies is available at <http://www.mtnstopshiv.org>.)

Epidemiology

NIAID's epidemiologic research explores the clinical course and factors contributing to the transmission of HIV/AIDS in a variety of populations. NIAID supports several studies, including the Women's Interagency HIV/AIDS Study (WIHS), which explores the clinical course of HIV/AIDS in women with a focus on minority women, and the Multicenter AIDS Cohort Study (MACS), a prospective, longitudinal study of HIV/AIDS in homosexual and bisexual men.⁴¹ The WIHS and MACS are the two largest observational studies of HIV/AIDS in women and homosexual or bisexual men in the United States. These studies have made major contributions to understanding how HIV is spread, understanding HIV disease and its progression to AIDS, and developing the most effective methods for treating HIV/AIDS. In 2003, MACS and WIHS expanded their cohorts by 60 percent. With these expanded groups, the

studies will focus on contemporary questions regarding HIV infection and treatment. This year, MACS is entering its 23rd year of research and WIHS has just completed its 13th year of research. In 2006, the enrollment of individuals from minority communities in NIAID-supported epidemiology cohorts was 36 percent in MACS and 87 percent in WIHS. The MACS is co-funded by the National Cancer Institute and the National Heart, Lung, and Blood Institute. The WIHS is co-funded by the National Cancer Institute, the National Institute of Child Health and Human Development, the National Institute of Dental and Craniofacial Research, and the National Institute on Drug Abuse.

NIAID Outreach Activities

Disseminating research results to the media, health professionals, and the public is an important aspect of NIAID's mission. Outreach activities include producing and publicizing print, audiovisual, and Web-based materials; distributing materials at professional and community meetings; and sponsoring workshops and conferences for community health care providers and the public.

NIAID produces materials on allergic and immunologic diseases, HIV/AIDS, STIs, and potential illnesses caused by agents of bioterrorism. Press releases, information sheets, and booklets are distributed worldwide in response to more than 10,000 annual requests. For example, the TB educational booklets "Learn About Tuberculosis/Aprenda Sobre la Tuberculosis" and "Learn About Tuberculosis Infection/Aprenda Sobre la Infeccion de la Tuberculosis" remain popular and are distributed widely each year. In addition, the NIAID Web site is visited 1.5 million times each month. Hundreds of thousands of inquirers request materials or download information from the NIAID Web site each year.⁴²

Expanding its outreach efforts, NIAID keeps more than 400 voluntary and scientific organizations updated about Institute activities. Periodic e-mails provide NIAID research news

and information on advances that specifically relate to an organization's research interests. In addition, workshops on HIV vaccine research have been featured at the AIDS Vaccine 2002 Conference, the Conference on Retroviruses and Opportunistic Infections, the U.S. Conference on AIDS, the National AIDS Treatment Advocates Forum, the National Association of People with AIDS Conference, and many other scientific and community-oriented conferences. NIAID provides exhibit booths at scientific, health-related, and student scientific organization meetings and conferences, where staff distribute materials about allergic, immunologic, and infectious diseases. Staff members working in the booths also answer questions about NIAID research and job opportunities. NIAID performs outreach at conferences sponsored by the following organizations:

- ▶ American Academy of Allergy, Asthma, and Immunology
- ▶ American Society for Microbiology
- ▶ American Indian Science and Engineering Society
- ▶ Hispanic Association of Colleges and Universities
- ▶ American Public Health Association
- ▶ Society for Advancement of Chicanos and Native Americans
- ▶ Congressional Black Caucus

NIAID has also provided outreach at the Annual Black Family Reunion, the Annual Biomedical Research Conference for Minority Students, and the National Conference on Blacks in Higher Education. NIAID is helping to construct community partnerships by targeting local news media, visiting local churches and other community organizations, and attending HIV/AIDS-related conferences and meetings.

Working directly with the public is one aspect of NIAID's outreach campaign. NIAID offers a public-speaking component consisting of researchers who will speak on request to community groups and at public schools. In addition, NIAID has participated in a community awareness program addressing cancer awareness, self-management techniques for asthma patients, and the silent damage done to the body by hypertension. Staff members have participated as judges in science fair projects at local schools. Working in local schools provides NIAID staff with the opportunity to interact with teachers, parents, and young scientists.

II. TRAINING AND ENHANCEMENT PROGRAMS FOR DIVERSITY IN RESEARCH

NIH-Wide Programs

Minority Biomedical Research Support Program

Through innovative programs and outreach efforts, NIH continually works to increase the number of minority groups that are represented in the field of biomedical research. The Minority Biomedical Research Support Program (MBRS) is one of the largest NIH programs working toward this goal. MBRS awards grants to educational institutions with a substantial body of diverse students from underrepresented groups enrolled in their programs. Grants are given to support faculty research, strengthen an institution's biomedical research capabilities, and increase the interest, skills, and competitiveness of students and faculty in the pursuit of careers in biomedical research. NIH Institutes contribute funds that support the MBRS Program to the National Institute of General Medical Sciences, which administers the MBRS program through its Division of Minority Opportunities in Research. (More information on the MBRS program is available at <http://www.nigms.nih.gov/Minority>.)

A reorganization of MBRS has increased the number of institutions that are eligible for research and institutional development support. Along with this increase, there also has been a rise in the average size of requested grant awards, making these grants comparable in size to other NIH research grants. There are three subcomponents of MBRS: the Support of Continuous Research Excellence (SCORE) initiative, the Research Initiative for Scientific Enhancement (RISE), and the Initiative for Minority Student Development (IMSD).

Collectively, SCORE, RISE, and IMSD provide support from the undergraduate level to the postdoctoral level in institutional development, student and faculty training, and student and faculty career development. Overall program goals for SCORE, RISE, and IMSD are to:

- ▶ Enhance the science curricula and faculty research capabilities at institutions with significantly underrepresented minority enrollment
- ▶ Encourage minority students to pursue training for scientific careers
- ▶ Strengthen the research skills of minority students and faculty

The opportunities provided by these programs encourage participation from institutions ranging from 2-year colleges to research-intensive institutions with doctoral programs.

SCORE provides financial assistance to competitive research programs in all areas of biomedical and behavioral research. Funding is provided to develop biomedical research faculty members who are committed to improving competitive research programs and increasing the number of underrepresented minorities who are professionally engaged in biomedical



Bio-medical research laboratory assistant testing vaccine in response to Hepatitis C virus infection.

research. The program supports faculty-initiated, scientifically meritorious research projects, including pilot research projects. The existing SCORE (S06) program, which had the structure of a non-thematic program project, has been revised so that separate funding opportunities exist for individual investigator-initiated research awards and for a stand-alone institutional award.

(More information on SCORE is available at <http://grants1.nih.gov/grants/guide/pa-files/ PAR-04-001.html>.)

RISE seeks to enhance the research environment at minority-serving institutions through faculty and student development by increasing the interests, skills, and competitiveness of students and faculty who are pursuing biomedical research careers. RISE offers support for faculty and student development activities such as on- and off-campus workshops, specialty courses, travel to scientific meetings, and research experiences at on- or off-campus laboratories. Support is also available for evaluation activities and limited institutional development (e.g., equipment purchases, development of research courses, or renovation or remodeling of existing facilities to provide space for an investigator to conduct developmental activities). (More information on RISE is available at <http://grants.nih.gov/grants/guide/pa-files/ PAR-05-127.html>.)

IMSD encourages domestic private and public educational institutions with fully developed and funded research programs to initiate or expand innovative programs to target underrepresented population of students. Institutions that receive the funding are expected to improve the academic and research capabilities of a diverse body of students and to facilitate their progress toward careers in biomedical research. Funding may also be directed toward developing underrepresented groups of scientists who are in any phase of their career development, from the undergraduate level through the Ph.D. level. IMSD grants are institutional awards that use the NIH education mechanism (R25). (More information on IMSD awards is available at <http://grants2.nih.gov/grants/guide/pa-files/ PAR-05-132.html>.)

Minority Access to Research Careers

The Minority Access to Research Careers (MARC) Undergraduate Student Training in Academic Research (U*STAR) program provides support for students who are members of minority groups that are underrepresented in the biomedical sciences at institutions with significant enrollment of a diverse body of students. U*STAR seeks to improve students' preparation for graduate training in biomedical research through faculty development, strengthening of science curricula, development of biomedical research training programs, and infrastructure development.⁴³ (More information on U*STAR is available at <http://grants1.nih.gov/grants/guide/pa-files/ PAR-02-033.html>.)

MARC predoctoral fellowships provide funding for graduates of the U*STAR program. The program provides outstanding U*STAR students with up to 5 years of support for research training leading to a Ph.D., M.D./Ph.D., or other professional degree combined with a Ph.D. in the biomedical or behavioral sciences, including mathematics. The MARC predoctoral fellowship program encourages students from groups that are underrepresented in the biomedical and behavioral sciences to seek graduate degrees. This program furthers the NIH goal of increasing the number of underrepresented scientists who are competitively trained to pursue careers in biomedical or behavioral research. (More information on these fellowships is available at <http://grants2.nih.gov/grants/guide/pa-files/ PAR-03-114.html>.)

MARC faculty predoctoral fellowships are awarded to faculty members of colleges or universities with significant enrollment of a diverse body of students. Awards provide eligible faculty who lack a Ph.D. degree or Ph.D. equivalent the opportunity to obtain a research doctorate. Applicants must be full-time, permanent faculty in a biomedical science or mathematics program and must have been at the institution for at least 3 years at the time of application. Candidates must be enrolled in or have been accepted into a Ph.D. or

combined M.D./Ph.D. training program in the biomedical or behavioral sciences at the time of application. Applicants must also state their intention to return to the institution at the end of their training period. (More information on faculty predoctoral fellowships is available at <http://www.nigms.nih.gov/Training/MARC/MARCFacultyPredoctoral.htm>.)

MARC faculty senior fellowships are awarded to eligible faculty members of colleges or universities with significant enrollment of a diverse body of students. The goal of the fellowship is to provide eligible faculty members with a year of intensive research in a state-of-the-art research environment to update their research skills or move into new areas of research. Applicants must be full-time faculty members in a biomedical science or mathematics program for at least 3 years at the time of application. Moreover, candidates must have received a Ph.D. or Ph.D. equivalent at least 7 years before the date of application. Candidates must state their intention to return to the institution at the end of their training period. Applicants must request support ranging from 1 academic year (e.g., 9 months) to 2 years. (More information about MARC faculty senior fellowships is available at <http://www.nigms.nih.gov/Training/Mechanisms/MARC/MARCFacultySenior.htm>.)

Research Supplements to Promote Diversity in Health-Related Research

In 1989, NIH launched an initiative to provide funding for underrepresented groups in biomedical research at all levels of career development. The Research Supplements for Underrepresented Minorities, now known as the Research Supplements to Promote Diversity in Health-Related Research, or the Diversity Supplements program, seeks to improve the diversity of the research workforce by supporting and recruiting students, postdoctorates, and eligible investigators from groups that are underrepresented in biomedical research. The Diversity Supplements program accomplishes

its mission by supplementing research grants that are currently funded by NIH Institutes and Centers. Investigators with an existing NIH grant may apply for supplemental funds to support high school, college, postgraduate, postdoctoral, or junior faculty researchers to work in an area closely allied to the funded research. Awards may be tied to the length of the parent grant and are limited to a total award period not to exceed 4 years.

The Diversity Supplements program includes individuals from underrepresented racial and ethnic groups, individuals with disabilities, and individuals from socially, culturally, economically, or educationally disadvantaged backgrounds. Funds are provided for salary, tuition, fees, expendable supplies, travel, and other incidentals. Award levels are determined by the targeted educational strata; smaller awards are made to high school students. Salary stipends depend on the individual's level of experience and are consistent with the salary scales provided to investigators at the same level of experience in the grantee institution. In FY 2006, NIAID funded 49 new and 83 continuing supplement applications for a total of \$6.6 million. Awardees included underrepresented investigators at the junior faculty, postdoctoral, predoctoral, undergraduate, and high school levels. The Diversity Supplements program promises to be successful in continuing to increase the total number of underrepresented individuals in biomedical research in areas of science that are relevant to NIAID's mission. (More information about the Diversity Supplements program is available at <http://www.niaid.nih.gov/ncn/training/diversitysupp.htm>.)

Research Centers in Minority Institutions

NIAID continues to work toward its goal of expanding the national capability for health sciences research through the Research Centers in Minority Institutions (RCMI) program. RCMI provides grant support to 4-year colleges and universities with health professional schools and graduate institutions that offer a doctorate in

the health professions or health-related sciences. The program assists institutions in strengthening and augmenting their human and physical resources for conducting biomedical or behavioral research. RCMI also fosters faculty expansion and development, infrastructure improvement, and the support of research-related activities, including laboratory renovation and equipment replacement. Through RCMI, institutions become more competitive in seeking funding for biomedical or behavioral research. Institutions

that qualify to receive RCMI support must have more than 50 percent of diversity in its student enrollment and be chartered to award M.D., D.V.M., D.D.S., or Ph.D. health science degrees.

RCMI's HIV/AIDS Infrastructure Initiative seeks to ensure that institutions have the physical facilities and faculty competence to participate in mainstream HIV/AIDS research. Support is awarded to expand physical infrastructure and improve faculty competence in virology,

immunology, molecular biology, and the neurosciences. Participating institutions are located in communities in which the HIV/AIDS epidemic has hit the hardest. As a result, these institutions are uniquely suited to treat and recruit patients in clinical trials. (More information about RCMI is available at http://www.nccr.nih.gov/resinfra/ri_rcmi.asp.)

RCMI is co-funded by NIAID and the National Center for Research Resources. NIAID provides support for RCMI HIV/AIDS research pilot projects as well as for infrastructure development. In FY 2005, NIAID awarded 10 projects in clinical research, molecular vaccine development,

opportunistic infections, and immunologic research to seven institutions.

NIAID Programs

The Office of Special Populations and Research Training (OSPRT) was established by NIAID's Director in 1998 to combine the functions formerly housed in the Office of Research on Minority and Women's Health and the Office of Science Training and Manpower Development. Combining the functions of these two offices under one entity has led to greater efficiency in developing research and training initiatives. OSPRT administers the Research Supplements to Promote Diversity in Health-Related Research and the Bridging the Career Gap for Underrepresented Scientists workshop (see following sections). It also serves as NIAID's coordinator and liaison for the Institute's Strategic Plan for Addressing Health Disparities. In addition, the Office plays a key role in reporting data about inclusion of women and minorities in Phase III clinical trials.

The OSPRT director has been instrumental in overseeing collaborative funding efforts between NIAID and the Center for Minority Health and Health Disparities and the Office of Research on Women's Health. OSPRT supports innovative programs such as the Inter-American College of Physicians and Scientists, the National Hispanic Youth Initiative, and the Temple University Longitudinal Program. A number of NIAID/OSPRT-administered programs are described in the following paragraphs.

Bridging the Career Gap

The Bridging the Career Gap for Underrepresented Students initiative was established in 1993 to increase the number of diverse populations of underrepresented investigators in biomedical research. The Bridging the Career Gap targets individuals who receive NIAID training and research supplemental awards and seeks to provide young investigators with the tools and information needed for a successful career in biomedical

Eleven medical schools are eligible to participate in the HIV/AIDS Infrastructure Initiative:

- Howard University
- Meharry Medical College
- Morehouse School of Medicine
- University of Puerto Rico Medical Sciences
- Morgan State University
- Universidad Central del Caribe
- Ponce School of Medicine
- Charles R. Drew School of Medicine and Science
- Texas Southern University
- University of Hawaii
- City University of New York

research. The initiative consists of a 2-day seminar, held biennially, that addresses career choices, networking, the importance of selecting the right mentor, and the NIH grant system and its components. The seminar also provides participants with the opportunity to network with NIAID intramural and extramural staff. NIAID staff continues to work closely with many students throughout various phases of their careers. The Bridging the Career Gap program demonstrates NIAID's interest in the academic future of its diversity training and research supplemental funding awardees. NIAID continues to develop innovative programs that will attract diverse populations of scientists to the Institute's research agenda.

Results from NIAID evaluations of the first two Bridging the Career Gap program cohorts illustrate the program's success. Survey results show that the seminar's many benefits include helping participants understand what to expect from careers in biomedical research and assisting individuals to determine what adjustments are needed in their current career direction to pursue futures in biomedical research. The seminar also provides participants with the opportunity to establish important NIAID contacts. The success of NIAID's Bridging the Career Gap program has been further validated through its replication in other NIH Institutes. The program is administered by OSPRT and is conducted with the assistance of NIAID scientific review, program, and grants management staff and with scientific and administrative experts from academia and industry aligned with NIAID. The seventh Bridging the Career Gap symposium took place in November 2005 and was attended by 40 individuals.

Centers for AIDS Research

NIAID promotes the development of scientists in HIV/AIDS research through the Centers for AIDS Research. These centers support a multidisciplinary environment promoting basic, clinical, behavioral, and translational research in the prevention, detection, and treatment of HIV/AIDS. They accomplish their mission

through conducting outreach, fostering scientific communication and training, and sponsoring education. The NIAID-sponsored Centers for AIDS Research are committed to educating and training investigators and providing outreach to those communities that have been disproportionately affected by HIV/AIDS.

Intramural NIAID Research Opportunities Program

In February 2005, NIAID's Office of Training and Special Emphasis Programs, which is under the Division of Intramural Research, held its third annual outreach program for underrepresented minorities in the biomedical sciences. This 5-day program on Intramural NIAID Research Opportunities included scientific lectures by NIAID researchers, discussions with scientists, and tours of the Research Technologies Branch and the VRC. Three key features distinguish this new program and will result in more diversity of the students participating in intramural training programs at all levels:

1. The selection of students is based on academic excellence, interest in NIAID research, and desire to participate in NIAID's Division of Intramural Research training programs.
2. Current diversity trainees in the Division of Intramural Research are included in all aspects of the program and are invited to give presentations, allowing the visiting students to see firsthand what can be accomplished and to network with the trainees.
3. All participants will be tracked in future years to inform them about NIAID training and professional opportunities and to enlist their participation in outreach activities conducted by the Office of Training and Special Emphasis Programs.

Eventually, this programmatic strategy will create a larger pool of potential candidates for career positions in NIAID.

In FY 2005, 12 Intramural NIAID Research Opportunities participants were offered training positions in Division of Intramural Research laboratories; 11 of these students have begun their laboratory traineeships in the following programs: Postdoctoral Intramural Research Training Awards, Postbaccalaureate Intramural Research Training Awards, Technical Intramural Research Training Awards, Summer Research Fellowship Program, and Summer Internship Program. (More information about the Introduction to NIAID Research Opportunities program is available at <http://www.niaid.nih.gov/dir/OTSEP/INRO/description.htm>.)

Temple University Longitudinal Program

In FY 2001, NIAID collaborated with the National Institute of Diabetes and Digestive and Kidney Diseases and the National Institute of Arthritis and Musculoskeletal and Skin Diseases to establish the Temple University Minority Access to Biomedical Research Careers initiative at Temple University in Philadelphia. The initiative is a longitudinal program that recruits outstanding middle-school students and provides them with additional instruction in mathematics and the sciences. The goal of this initiative is to increase the pool of M.D./Ph.D. program applicants by ensuring that students succeed in high school and continue their education to obtain graduate degrees. Participating students are extremely motivated, have research experience, and have very strong academic records. During the summer of their junior and senior years of high school, participants are placed in NIAID intramural laboratories for an 8-week rotation. When participants enter college, 9-week summer experiences are rotated among Federal, private, and academic institutions.

Participating students assist in research projects, and many of them have been cited in research publications. In FY 2005, 263 students participated: 164 African Americans, 58 Asians, 5 Pacific Islanders, and 36 Hispanics. In FY 2006, 288 students participated: 178 African Americans, 36 Hispanics, 58 Asians, and 16

Pacific Islanders. (More information about the program can be found at http://gong.temple.edu/search?q=PSTP&site=temple_index%7Clibrary_index&restrict=temple&client=temple_index&proxystylesheet=temple_index&output=xml_no_dtd.)

Biomedical Research After School Scholars

Since 1998, scientists from NIAID's Rocky Mountain Laboratories in Hamilton, MT, have teamed with local middle and high schools to present the Biomedical Research After School Scholars (BRASS) program. BRASS introduces students in grades 7 through 12 to the fundamentals and relevance of biomedical research to stimulate their interest in science and encourage them to pursue careers in biomedical research. The program encourages a broad range of student participation, including minorities, young women, and economically disadvantaged and at-risk students.

BRASS consists of five 2-hour laboratory sessions covering hematology, genetics, cancer, infectious diseases, and animal research. Each 2-hour session is highly interactive, as scientists provide background on topics using the scientific method. The program concludes with a commencement ceremony featuring a guest speaker and laboratory demonstrations conducted by the students.

More than 60 scientists and 350 students have participated in BRASS. Rocky Mountain Laboratories scientists have worked with middle schools in Montana, including Hamilton, Corvallis, Victor, Darby, Stevensville, and Lone Rock middle schools. (A March 2003 regional newspaper article written by students from Lone Rock Middle School can be found at <http://www.missoulian.com/articles/2003/03/17/export3781.txt>.)

In 2000, Rocky Mountain Laboratories expanded BRASS to schools located in American Indian and Alaska Native communities. Over the past three summers, 45 scientists have participated

in the Pathways to Academic Excellence, a mini-BRASS program at an American Indian and Alaska Native summer math and science camp. More than 150 American Indian and Alaska Native students have participated in the mini-course.

Collaborative Efforts

Native American Research Centers for Health

In FY 2001, the National Institute of General Medical Sciences and the Indian Health Service developed the Native American Research Centers for Health (NARCH) program. NARCH supports the development of partnerships composed of American Indian and Alaska Native tribes or tribal-based organizations (e.g., the National Indian Health Board, Local Area Health Boards) and institutions conducting intensive, academic-level biomedical and behavioral research. The purpose of NARCH is to

- ▶ Encourage competitive research linked to reducing health disparities
- ▶ Develop a cadre of American Indian and Alaska Native scientists and health professionals who are engaged in biomedical, clinical, and behavioral research and who will be able to compete for NIH funding
- ▶ Increase the collaborative efforts of research-intensive institutions and American Indian and Alaska Native organizations
- ▶ Reduce American Indian and Alaska Native communities' skepticism toward government-funded research

NARCH continues to support research, student development, and faculty development projects. As a part of NARCH, NIAID supports studies that will investigate adult pneumococcal infections in Alaska Natives and White Mountain Apaches. Support for these studies will continue through FY 2006 and is anticipated to continue through FY 2007. (More information about

NARCH is available at <http://grants.nih.gov/grants/guide/notice-files/NOT-GM-04-107.html>.)

Interamerican College of Physicians and Surgeons

Increasing the participation of Hispanic investigators in virtually all fields of biomedical research is a continuing NIH and NIAID priority. NIAID supports a variety of diversity programs for biomedical research, from high school through postdoctoral training. NIAID's OSPRT is engaged in an extensive outreach campaign targeting colleges, universities, medical centers, and professional organizations to encourage the participation of investigators in NIAID research activities. The Interamerican College of Physicians and Surgeons (ICPS) is an OSPRT-supported outreach activity that targets a specific underrepresented community. Founded in 1979, ICPS promotes cooperation among U.S. Hispanic physicians and seeks to advance their professional and educational development. ICPS is the only national organization representing Hispanic physicians. (More information about ICPS is available at <http://www.icps.org>.)

ICPS outreach capabilities help increase Hispanic students' participation in biomedical research, educate communities regarding Latino health issues, and explain NIAID's role in addressing health issues through research and other activities. NIAID continues to provide funding to the ICPS National Hispanic Youth Initiative in Health summer program. This program introduces Hispanic youth to careers in biomedical research through scientific seminars and field trips. The National Hispanic Youth Initiative motivates, prepares, and encourages Hispanic high school juniors and seniors to pursue careers in the health sciences.

Association of American Indian Physicians National Native American Youth Initiative

Through its cooperative agreement with the Office of Minority Health, the Department of Health and Human Services' Association of American Indian Physicians offers a health, biomedical research, and policy development program for American Indian and Alaska Native students between the ages of 16 and 18 years. The Association seeks to motivate American Indian and Alaska Native students to remain in school and pursue careers in the health professions and/or biomedical research. The National Native American Youth Initiative prepares American Indian and Alaska Native students for admission to college and professional schools by empowering students with effective leadership skills, analytical skills, and academic proficiency. Promoting self-awareness, the initiative educates students about health status, health care research issues, and policies and legislation that affect American Indian and Alaska Native communities. The National Native American Youth Initiative is an intense academic enrichment and reinforcement program consisting of mini-block courses addressing leadership, communication, study skills, testing skills, assertiveness, networking, professional behavior, interactive learning, and time management. Courses are designed to increase students' skills so they are better prepared to remain in school and pursue a career in the health professions and/or biomedical research. The summer program introduces students to the variety of health careers available to American Indian and Alaska Native youth. Association of American Indian Physicians members, health professionals, and traditional healers provide a personal perspective for students by relating their experiences in health careers to their familiarity with collaborative efforts between Western and traditional medicine. (More information about the National Native American Youth Initiative is available at <http://www.aaip.org/programs/nnayi/nnayi.htm>.)

III. FUTURE PLANS

Allergy, Immunology, and Transplantation

NIAID will continue to work toward meeting its goals of increasing efforts in the areas of allergy, immunology, and transplantation that target diverse populations and their health care. Plans include the following:

- ▶ Through the Immune Tolerance Network, the Autoimmunity Centers of Excellence, and its own intramural research programs, NIAID will continue to conduct and support clinical trials and assay development for promising tolerance induction and immunomodulatory strategies to treat asthma and allergic diseases; autoimmune diseases, including systemic lupus erythematosus and scleroderma; and rejection of transplanted organs, tissues, and cells.
- ▶ In FY 2007, NIAID submitted to Congress the “Action Plan for Transplantation Research,” a report summarizing the findings of an expert panel on clinical and basic research priorities in transplantation and will make recommendations for future research efforts. NIAID led the NIH-wide efforts to convene this expert panel. (The report can be found at <http://www3.niaid.nih.gov/about/overview/planningPriorities/trap2007.htm>.)

Microbiology and Infectious Diseases

NIAID plans to continue its multidisciplinary microbiology and infectious disease strategies through basic research, targeted studies, and the development of innovative vaccine delivery

techniques for diseases and infections that disproportionately affect marginal populations.

Support for investigator-initiated research in areas related to minority health will remain a priority. These areas include:

▶ Tuberculosis

Example: NIAID is currently renewing the Tuberculosis Research Unit contract to conduct international and cross-disciplinary clinical research in tuberculosis.

▶ Sexually transmitted infections

Example: NIAID-funded researchers are enrolling 7,550 participants for a Phase III trial of a vaccine for the prevention of genital herpes (Herpevac Trial for Women).

▶ Hepatitis C

Example: Under the Partnerships for Hepatitis C Vaccine Development Program, NIAID is partnering with industry to advance the development of vaccines for hepatitis C.

Example: NIAID renewed the Hepatitis C Cooperative Research Centers program, which includes eight multidisciplinary, collaborative research centers conducting basic, animal model, and clinical research with an emphasis on translational research.



Young boy receiving allergy shot from his doctor.

HIV/AIDS

NIAID has restructured its HIV/AIDS clinical trials networks to increase their efficiency, accountability, integration, and capacity to effectively conduct vital clinical research in the following high-priority areas:

- ▶ Developing preventive HIV vaccines
- ▶ Translating research insights into therapies to treat HIV disease
- ▶ Optimizing clinical management of HIV/AIDS, including co-infections and other HIV-related conditions
- ▶ Developing microbicides to prevent HIV acquisition and/or transmission
- ▶ Preventing mother-to-child transmission of HIV
- ▶ Developing other methods for HIV prevention

Another major goal of the restructuring was to ensure that those populations that are most affected or threatened by the HIV/AIDS epidemic in the United States and abroad, especially women, adolescents, and people of color, have access to clinical research.

NIAID will also:

- ▶ Continue to co-fund meritorious, peer-reviewed HIV/AIDS projects through the HIV/AIDS Infrastructure Initiative of the Research Centers in Minority Institutions program.
- ▶ Continue to support grant supplements to attract a diverse body of investigators into biomedical and behavioral research through the Research Supplement to Promote Diversity in Health-Related Research (“Diversity Supplements”) program (formerly known as the Research Supplements for Underrepresented Minorities program).

- ▶ Continue to evolve and implement the NIAID HIV Vaccine Research Education Initiative and to coordinate activities surrounding the observance of HIV Vaccine Awareness Day.
- ▶ Continue to fund the Multicenter AIDS Cohort Study and the Women’s Interagency HIV/AIDS Study epidemiologic cohorts.

Training

NIAID continues to support training efforts that encourage investigators to pursue careers in biomedical research. Specific plans include the following:

- ▶ Continue to support the training programs administered through the National Institute of General Medical Sciences.
- ▶ Continue to fund the AIDS projects conducted in the National Center for Research Resources’ Research Centers in Minority Institutions program.
- ▶ Expand the Intramural NIAID Research Opportunities program to 5 days and enroll up to 20 students.
- ▶ Continue efforts to increase the number of researchers supported by the Diversity Supplements program and the Bridging the Career Gap seminar.
- ▶ Explore new concepts and ideas to improve outreach efforts to pre-college students and continue to support educational efforts in middle schools and high schools, including the Temple Longitudinal Program, the Partnership in Education Program, and the Biomedical Research After School Scholars program.
- ▶ Continue to actively recruit a diverse cadre of researchers to its scientific mission.

Outreach Activities

NIAID will continue its efforts to disseminate research results to the media, health professionals, and the public. Specific outreach activities include the following:

- ▶ Continue to implement innovative activities designed to improve awareness of biomedical research issues, awareness of clinical trials, and interest in biomedical research in underrepresented communities.
- ▶ Continue to support programs that increase the numbers of underrepresented populations, individuals with disabilities, and disadvantaged backgrounds to pursue careers in biomedical research.
- ▶ Continue efforts to increase public awareness of HIV vaccine research and to recruit diverse volunteers for future clinical studies.
- ▶ Continue outreach activities, including producing and publicizing print, audiovisual, and Web-based materials; distributing materials at professional and community meetings; and sponsoring workshops and conferences for community health care providers and the public.
- ▶ Continue to inform more than 400 voluntary and scientific organizations about Institute activities.

Overview of Student Training Programs

Name of Program	Stated Purpose	Who Is Eligible	For Further Information
NIH-WIDE PROGRAMS			
Minority Biomedical Research Support Program (MBRS) Subcomponents:	Increase the number of researchers in the field of biomedical research.	Educational institutions with significant enrollment of a diverse body of students	http://www.nigms.nih.gov/Minority
Support of Continuous Research Excellence (SCORE)	Develop biomedical research faculty members committed to improving competitive research programs.	Competitive research programs in all areas of biomedical and behavioral research	http://grants.nih.gov/grants/guide/pa-files/PAR-04-001.html
Research Initiative for Scientific Enhancement (RISE)	Enhance the research environment at resource-limited institutions through development of students and faculty pursuing biomedical research careers.	Health educational institutions with significant student enrollment of underrepresented groups	http://grants.nih.gov/grants/guide/pa-files/PAR-05-127.html
Initiative for Minority Student Development (IMSD)	Initiate and/or expand innovative programs to target a diverse population of students.	Underrepresented minority scientists in any phase of career development at private and public educational institutions	http://grants2.nih.gov/grants/guide/pa-files/PAR-05-132.html
Undergraduate Student Training in Academic Research (U*STAR)	Improve students' preparation for graduate training in biomedical research through faculty development, strengthening of science curricula, development of biomedical research training programs, and infrastructure development.	Students who are members of minority groups that are underrepresented in the biomedical sciences at institutions with significant minority student enrollments	http://grants1.nih.gov/grants/guide/pa-files/PAR-02-033.html
Minority Access to Research Careers (MARC)			http://www.nigms.nih.gov/Minority/MARC
Predoctoral fellowships	Provide outstanding U*STAR students with up to 5 years of support for research training leading to a PhD, MD/PhD, or other professional degree combined with a PhD in the biomedical or behavioral sciences.	Graduates of the U*STAR program	http://grants2.nih.gov/grants/guide/pa-files/PAR-03-114.html
Faculty predoctoral fellowships	Provide eligible faculty the opportunity to obtain a research doctorate.	Full-time, permanent faculty in a biomedical science or mathematics program who have been at a minority institution for at least 3 years	http://www.nigms.nih.gov/Training/MARC/MARCFacultyPredoctoral.htm
Faculty senior fellowships	Provide eligible faculty members with a year of intensive research in a state-of-the-art research environment to update their research skills or move into new areas of research.	Full-time faculty members in a biomedical science or mathematics program for at least 3 years	http://www.nigms.nih.gov/Training/Mechanisms/MARC/MARCFacultySenior.htm

Name of Program	Stated Purpose	Who Is Eligible	For Further Information
Research Supplements to Promote Diversity in Health-Related Research ("Diversity Supplements" program)	Increase the number of underrepresented minorities in biomedical research by supplementing research grants that are currently funded by NIH Institutes and Centers.	Investigators with an existing NIH grant seeking supplemental funds to support high school, college, postgraduate, postdoctoral, or junior faculty researchers to work in an area closely allied to the funded research	http://www.niaid.nih.gov/ncn/training/diversitysupp.htm
Research Centers in Minority Institutions (RCMI)	Assist institutions in strengthening and augmenting their human and physical resources for conducting biomedical or behavioral research.	Institutions with more than 50 percent diversity of student body enrollment and are chartered to award M.D., D.V.M., D.D.S., or Ph.D. health science degrees	http://www.ncrr.nih.gov/resinfra/ri_rcmi.asp
NIAID PROGRAMS			
Intramural NIAID Research Opportunities	Increase the diversity of students participating in intramural training programs at all levels.	Selection of students based on academic excellence, interest in NIAID research, and desire to participate in NIAID's intramural research training programs	http://www.niaid.nih.gov/dir/OTSEP/INRO/description.htm
Temple University Minority Access to Biomedical Research Careers	Increase the pool of M.D./Ph.D. program applicants by ensuring that students succeed in high school and continue in their education to obtain graduate degrees.	Junior and senior high school students with high motivation, research experience, and strong academic records	http://gong.temple.edu/search?q=PSTP&site=temple_index%7Clibrary_index&restrict=temple&client=temple_index&proxystylesheet=temple_index&output=xml_no_dtd
COLLABORATIVE EFFORTS			
Native American Research Centers for Health (NARCH)	Develop a cadre of American Indian and Alaska Native scientists and health professionals who are engaged in biomedical, clinical, and behavioral research and who will be able to compete for NIH funding.	American Indian and Alaska Native tribes or tribal-based organizations and institutions conducting intensive, academic-level biomedical and behavioral research	http://grants.nih.gov/grants/guide/notice-files/NOT-GM-04-107.html
Interamerican College of Physicians and Surgeons (ICPS)	Promote cooperation among U.S. Hispanic physicians to advance their professional and educational development.	OSPRT-supported outreach activity targeting the underrepresented Hispanic community	http://www.icps.org
Association of American Indian Physicians National Native American Youth Initiative	Prepare American Indian and Alaska Native students for admission to college and professional schools by empowering students with effective leadership skills, analytical skills, and academic proficiency.	Native American high school students ages 16–18	http://www.aaip.org/programs/nnayi/nnayi.htm

ABBREVIATIONS FOR PROGRAMS AND INITIATIVES DESCRIBED IN THIS REPORT

- ACE:** Autoimmunity Centers of Excellence (<http://grants.nih.gov/grants/guide/rfa-files/RFA-AI-02-006.html>)
- ACTG:** Adult AIDS Clinical Trials Group (<http://aactg.s-3.com>)
- ADCC:** Autoimmune Diseases Coordinating Committee (<http://www.niaid.nih.gov/publications/pdf/ADCCFinal.pdf>)
- BRASS:** Biomedical Research After School Scholars
- HPTN:** HIV Prevention Trials Network (<http://www.hptn.org>)
- HVAD:** HIV Vaccine Awareness Day (<http://www3.niaid.nih.gov/news/events/HVAD>)
- HVTN:** HIV Vaccine Trials Network (<http://www.hvtn.org>)
- ICPS:** Interamerican College of Physicians and Surgeons (<http://www.icps.org>)
- IMPAACT:** International Maternal Pediatric Adolescent AIDS Clinical Trials (<http://pactg.s-3.com/>)
- IMSD:** Initiative for Minority Student Development (<http://grants2.nih.gov/grants/guide/pa-files/PAR-05-132.html>)
- INSIGHT:** International Network for Strategic Initiatives in Global HIV Trials (<http://www.insight-trials.org/index.php>)
- ITN:** Immune Tolerance Network (<http://www.immunetolerance.org>)
- LPP:** Local Partnership Program
- MACS:** Multicenter AIDS Cohort Study (<http://www.statepi.jhsph.edu/macs/macs.html>)
- MADGC:** Multiple Autoimmune Disease Genetics Consortium (<http://www.madgc.org>)
- MARC:** Minority Access to Research Careers (<http://www.nigms.nih.gov/Minority/MARC>)
- MBRS:** Minority Biomedical Research Support Program (<http://www.nigms.nih.gov/Minority>)

- MTN:** Microbicide Trials Network (<http://www.mtnstopshiv.org>)
- NARCH:** Native American Research Centers for Health (<http://grants.nih.gov/grants/guide/notice-files/NOT-GM-04-107.html>)
- NHVREI:** NIAID HIV Vaccine Research Education Initiative (<http://www.bethegeneration.org>)
- RCMI:** Research Centers in Minority Institutions (http://www.ncrr.nih.gov/resinfra/ri_rcmi.asp)
- RISE:** Research Initiative for Scientific Enhancement (<http://grants.nih.gov/grants/guide/pa-files/PAR-05-127.html>)
- SCORE:** Support of Continuous Research Excellence (<http://grants1.nih.gov/grants/guide/pa-files/PAR-04-001.html>)
- U*STAR:** Undergraduate Student Training in Academic Research (<http://grants1.nih.gov/grants/guide/pa-files/PAR-02-033.html>)
- VRC:** Vaccine Research Center (<http://www.niaid.nih.gov/vrc>)
- WIHS:** Women's Interagency HIV/AIDS Study (<http://statepiaps.jhsph.edu/wihs>)

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