MINORITY AND WOMEN'S HEALTH

NIAID's Office of Special Populations and Research Training (OSPRT) provides oversight and coordination to the Institute's activities in the area of minority and women's health. OSPRT has provided the National Center for Minority Health and Health Disparities with benchmarks on progress made to initiatives contained in the NIAID fiscal year (FY) 2002–2006 *Strategic Plan for Addressing Health Disparities*. The plan lists three goals: (1) to conduct research to identify and address health disparities among various populations affected by infectious and immunologic diseases; (2) to increase the number of minority scientists and grantees; and (3) to improve education and outreach activities for the transfer of health information to these populations. NIAID continues to prioritize basic, clinical, and epidemiologic research on the health problems of minorities and women; efforts to increase participation of minority scientists in its research programs; and outreach activities designed to communicate research developments to these populations. (For the NIAID *Strategic Plan for Addressing Health Disparities*, see: *www.niaid.nih.gov/healthdisparities/niaid_hd_plan_final.pdf*.)

OSPRT staff played a major role in updating the NIH report, *Monitoring Adherence to the NIH Policy on the Inclusion of Women and Minorities as Subjects in Clinical Research*, as required by the Government Accountability Office. OSPRT staff also assisted in the development of the *Outreach Notebook* for extramural principal investigators who conduct or plan to conduct clinical trials with human subjects. (For the NIH report, *Monitoring Adherence to the NIH Policy on the Inclusion of Women and Minorities as Subjects in Clinical Research*, see: *www4.od.nih.gov/orwh/Updated_2002-2003.pdf*; for the *Outreach Notebook*, see: *www4.od.nih.gov/orwh/outreach.pdf*.)

Minority and Women's Health Programs

Many infectious, immunologic, and allergic diseases affect minorities and women at disproportionately high rates and fall under the mandate of NIAID. The Institute conducts research, either through its own laboratories or through funded mechanisms, on a broad spectrum of these diseases. Additionally, the Institute collaborates with other organizations to address health disparities in these populations.

Asthma. Asthma is a chronic disease affecting more than 18 million Americans. It disproportionately affects minorities, particularly African American and Hispanic children residing in inner cities. Results from the Inner-City Asthma Study, cosponsored by the National Institute of Environmental Health Studies, indicate that physician education and an extensive environmental intervention successfully reduced allergen levels in the homes of inner-city children with asthma. This reduction resulted in an improvement in asthma morbidity, measured by decreases in asthma symptoms, number of hospitalizations, and number of unscheduled physician visits for asthma. The reduction continued 1 year post-intervention. The physician feedback intervention resulted in a 20 percent decrease in unscheduled emergency room or clinic visits for poorly controlled asthma.[42] These findings should lead to significantly improved health for inner-city children with asthma and reduce the high medical, economic, and social costs associated with this disease.

Autoimmune diseases. Autoimmune diseases are those in which the immune system mistakenly attacks the body's own cells, tissues, and organs. Autoimmune diseases affect an estimated 5 to 8 percent of the U.S. population, approximately 14 to 22 million people. Several of these diseases disproportionately affect women and minority populations. For example, in some autoimmune diseases, including thyroiditis, scleroderma, systemic lupus erythematosus

(SLE), and Sjögren's syndrome, females represent 85 percent or more of patients. Ninety percent of the nearly 2 million Americans diagnosed with (or suspected of having) SLE are women. SLE damages multiple tissues and organs and may affect muscles, skin, joints, and kidneys, as well as the brain and nerves. In other diseases such as multiple sclerosis, myasthenia gravis, and inflammatory bowel diseases, the disparity is smaller, with females representing 55 to 70 percent of patients. The reasons for these gender-based variations are not known.

NIAID supports a broad range of basic and clinical research programs in autoimmunity, including the Autoimmunity Centers of Excellence, the Autoimmune Diseases Prevention Centers, and multidisciplinary research on gender-based differences in immune responses. Through the Stem Cell Transplantation for Autoimmune Diseases Consortium, NIAID is developing clinical trials to assess the efficacy of hematopoietic stem cell transplantation to treat severe multiple sclerosis, SLE, and scleroderma. The consortium will conduct studies of the underlying immune mechanisms of these diseases as well. NIAID chairs the trans-NIH Autoimmune Diseases Coordinating Committee (ADCC), which submitted its Research Plan to Congress in December 2002. The ADCC expects to submit its third report to Congress in early 2005, which will include NIH accomplishments and activities in autoimmune diseases research. (For the ADCC Research Plan, see: *http://www.niaid.nih.gov/dait/pdf/ADCC_Report.pdf*.)

Collaborations among NIAID, National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), and the Juvenile Diabetes Research Foundation International established the Immune Tolerance Network (ITN), an international consortium dedicated to the clinical evaluation of novel, tolerogenic approaches for the treatment of autoimmune diseases, asthma and allergic diseases, and the prevention of graft rejection. ITN also conducts integrated studies on the underlying mechanisms of these approaches and develops and evaluates markers and assays to measure the induction, maintenance, and loss of tolerance in humans. ITN includes more than 80 basic and clinical scientists and physicians at more than 40 institutions in the United States, Canada, Europe, and Australia. (For more information about the ITN, see: *www.immunetolerance.org*.)

Hepatitis C. Hepatitis C virus (HCV) infection is the most common chronic bloodborne viral infection in the United States. HCV disproportionately affects minority populations, particularly African Americans and Hispanics. Moreover, available treatments for HCV tend to be less effective for African Americans than for other populations.[43]

To investigate this issue, NIAID is supporting a study to determine whether there are specific genetic and molecular factors that cause African American patients to respond poorly to the standard interferon and ribavirin therapy used for hepatitis C that seems to be effective in White populations. Understanding the reasons for differential drug responses among these populations may lead to the development of new HCV-targeted drugs. In particular, NIAID supports the Hepatitis C Cooperative Research Centers Network, which unites basic and clinical researchers investigating HCV infection and the disease process to identify new and better means of prevention and treatment.

HIV/AIDS. HIV/AIDS continues to disproportionately affect minorities. Racial and ethnic populations in the United States, primarily African Americans and Hispanics, constitute 58 percent of the more than 880,000 cases of AIDS reported to the Centers for Disease Control and Prevention (CDC) since the epidemic began in 1981. African Americans make up almost 40 percent of all AIDS cases reported in the United States, yet according to the U.S. Census Bureau, they comprise only 13 percent of the U.S. population. Hispanics represent 18 percent of all AIDS cases and are approximately 14 percent of the U.S. population. Of the new AIDS cases

reported in 2003, 49 percent were among African Americans, 20 percent among Hispanics, 28.3 percent among Whites, and 1.7 percent among American Indians/Alaska Natives and Asian Americans/Pacific Islanders. Among women, African Americans and Hispanics account for 83 percent of AIDS cases; among men, African Americans and Hispanics account for 64 percent of cases. Injection drug use is a major factor in the spread of HIV in minority communities. Other factors contributing to the spread of HIV/AIDS in these communities include men who have sex with men (MSM) and, increasingly, heterosexual transmission.[44]

HIV/AIDS also continues to increase among women. In 2004, the Joint United Nations Programme on HIV/AIDS estimated that nearly 40 million people were living with HIV/AIDS worldwide, with women accounting for nearly 50 percent of all cases.[45] In the United States, as of December 2003, women accounted for more than 18 percent (170,679) of the cumulative estimated number of 929,985 AIDS cases reported among adults and adolescents. In recent years, the incidence of AIDS has increased more rapidly among women than men. The proportion of new AIDS cases among women more than tripled from 1985 to 2002, from 7 percent to 26 percent. Fifty-three percent of HIV-infected women in the United States acquired HIV through heterosexual contact with HIV-infected men, and 42 percent through injection drug use. Also, HIV infection disproportionately affects minority women. Seventy-eight percent of HIV-infected women are African American and/or of Hispanic ethnicity, compared with only 52 percent of HIV-infected men.[46]

NIAID's epidemiologic research explores the clinical course of and factors contributing to the transmission of HIV infection in a variety of populations. Groups of inner-city women and their children are the focus of the Women and Infants Transmission Study (WITS). Begun in 1990, WITS is a collaborative, multisite, longitudinal, natural history that has enrolled more than 2,000 HIV-infected pregnant women and has followed post-partum mothers and their children. (For more information about WITS, see: *http://www.niaid.nih.gov/daids/wits.htm*.)

The Women's Interagency HIV Study (WIHS) includes both HIV-infected and uninfected women. The Multicenter AIDS Cohort Study (MACS) is a prospective, longitudinal study of HIV disease in homosexual and bisexual men. WIHS and MACS are the two largest observational studies of HIV/AIDS in women and homosexual or bisexual men, respectively, in the United States. Studies from these cohorts have repeatedly made major contributions to understanding how HIV is spread, how the disease progresses, and how it can best be treated. WIHS and MACS have completed their expansion to increase the size of the study groups by 60 percent and increase the number of minority participants. WIHS has expanded with an increase greater than 100 percent of the initial target enrollment. The expanded cohorts will focus on contemporary questions regarding HIV infection and treatment. (For more information about WIHS, see: *http://www.niaid.nih.gov/reposit/WIHS.htm*.)

WIHS researchers have published more than 250 peer-reviewed articles covering a wide scope of scientific research including the natural history of HIV infection; the impact of opportunistic infections and co-infections; the value of HIV viral load and CD4+ cell counts as markers of the success of highly active antiretroviral therapy (HAART); clinical outcomes of HAART therapy; the identification of biological, psychosocial and behavioral risk factors; the impact of aging and hormonal factors; the study of HIV-associated malignancies, particularly cervical cancer caused by the human papillomavirus; the analysis of gender differences in HIV disease; and the development of novel methods for analyses of cohort data. In addition, the cohort has provided an invaluable repository of clinical specimens and accompanying demographic and epidemiologic data to be used

for retrospective hypothesis testing. Currently, the WIHS is evaluating the cardiovascular manifestations of HIV among women.

A healthy minority woman expecting a healthy baby.

Mother-to-child transmission (MTCT) of HIV—which can occur during pregnancy, childbirth, or through breastfeeding—accounts for more than 90 percent of all cases of childhood HIV infection, especially in countries where effective antiretroviral drugs are not available. As more women of childbearing age become infected, the number of children infected with HIV also is expected to rise.[47] Efforts to prevent MTCT by targeting both the infant and the mother are being examined by the HIV Prevention Trials Network (HPTN) and the Pediatric AIDS Clinical Trials Group (PACTG), two NIAID-funded networks that support both domestic and international clinical research. Data from a NIAID-funded study that began in November 1997 in Uganda showed that the initial benefit to infants who, along with their mothers, received one dose of nevirapine, was sustained by the group of children until they reached age 18 months. These findings indicate that short-course nevirapine effectively and safely reduces MTCT of HIV and, because of its low cost and ease of administration, provides an important alternative in resource-poor developing countries. Final followup for this study is completed, and data analysis is ongoing. (For more information about the HPTN, see: *http://www.niaid.nih.gov/factsheets/hptn.htm*.)

NIAID continues to support other research on gender-specific issues in HIV treatment through the Adult AIDS Clinical Trial Group (AACTG). Several studies have been initiated through the AACTG to examine, among other research questions, the pharmacokinetics of contraceptives in the setting of HAART; the use of antiretroviral therapy in pregnancy; gender differences in responses to HAART among treatment-naive patients; toxicities and complications of different treatment regimens for HIV and HIV co-infections, such as human papillomavirus; metabolic complications of HAART; and changes in immunologic responses during postpartum. (For more information about the AACTG, see: *http://aactg.s-3.com/index.htm*.)

The HIV Vaccine Trials Network (HVTN) is an international network dedicated to developing HIV vaccines through testing and evaluating candidate vaccines in clinical trials. The HPTN also conducts clinical trials of nonvaccine HIV prevention strategies, including topical microbicides and MTCT studies, to develop and evaluate simple and less costly prevention regimens suitable for global use. MTCT studies also are carried out in the PACTG. Both HVTN and HPTN have initiated community outreach programs to educate people about HIV vaccine and prevention research and to encourage participation in clinical trials. Through these outreach activities, HVTN and HPTN researchers enroll in their clinical trials a diversified population that includes minorities and women. (For more information about the HVTN, see: *http://www.niaid.nih.gov/daids/vaccine/clinical.htm*.)

One of the greatest challenges facing HIV/AIDS researchers today is the recruitment and retention of minorities and women for clinical trials. As the epidemic continues to expand in minority communities, inclusion of these individuals in clinical trials is particularly urgent to ensure that the results of research are applicable to all populations affected by the disease. In October 2003, NIAID hosted a conference, "Increasing Diversity in Clinical Trials: Best Practices," to explore the most effective strategies for recruiting minorities and women in clinical trials. (For more information about the conference, see: *http://www.niaid.nih.gov/healthdisparities/hdsymposium/proceedings2*.)

Also, to address the issues of recruiting and retaining minorities and women for clinical trials, NIAID released a new program announcement (PA), "Enrolling Women and Minorities in HIV/AIDS Research Trials," to fund innovative approaches to reach, enroll, and retain women and racial/ethnic minorities in HIV/AIDS research trials in the United States. The PA will support projects to increase the number of women and minorities who participate in clinical trials for HIV/AIDS, relative to the incidence data, and will advance the body of scientific knowledge to improve the diagnosis, treatment, and development of preventive strategies in women and minorities. Additionally, each of NIAID's large, multicenter therapeutic clinical trials networks, namely, the AACTG, PACTG, and the Terry Beirn Community Programs for Clinical Research on AIDS strives to ensure enrollment of a sufficient proportion of minority subjects.

NIAID is currently in the third year of its HIV Vaccine Communications Campaign (HVCC), which is aimed at developing and implementing a national education campaign to increase awareness of and support for HIV vaccine research, especially in at-risk populations such as African Americans, Hispanics, and MSM. The Division of Acquired Immunodeficiency Syndrome receives input and guidance for developing appropriate and culturally sensitive messages from the HIV Vaccine Communications Steering Group, which includes representatives from community groups, other Federal agencies, pharmaceutical companies, and HIV vaccine advocacy groups.

A national survey was conducted to assess the attitudes and knowledge of HIV vaccine research in the general population as well as in segmented groups of African Americans, Hispanics, and MSM. According to data submitted for publication, 47.1 percent of African Americans, 26.5 percent of Hispanics/Latinos, and 13.4 percent of MSM believe an HIV vaccine already exists and is being kept secret; 22.0 percent of African Americans and 23.6 percent of the general public are aware that vaccines being tested cannot cause HIV infection; and 34.9 percent of African Americans and 28.8 percent of the general population support HIV vaccine trial volunteerism. These results indicate that misinformation and distrust continue to present formidable barriers to support for HIV vaccine research, and low public awareness and knowledge of HIV vaccine research must be addressed in order to develop and sustain HIV vaccine clinical research efforts. The HVCC is working to correct these misperceptions and to provide accurate information about HIV vaccine research.

Another major activity of the HVCC is to coordinate activities surrounding HIV Vaccine Awareness Day (HVAD), last held May 18, 2004. HVAD was established as a day to acknowledge and thank all the volunteers and researchers involved in HIV vaccine research. Community activities and media events around the country highlight research advances, address challenges associated with HIV/AIDS, recognize volunteers who have participated in HIV vaccine clinical trials, underscore why preventive HIV vaccines will offer the best hope for controlling the AIDS pandemic, and recognize the need for education. (For more information about HVAD, see: *www.niaid.nih.gov/newsroom/mayday/default.htm*.)

In FY 2004, the HVCC, through its contract with Ogilvy Public Relations Worldwide, awarded subcontracts to 8 national and 20 community organizations as part of the Community Education and Outreach Partnership Program (CEOPP). The CEOPP was designed to create local and national partnerships aimed at increasing the campaign's ability to provide messages to high-risk populations, specifically African Americans, Hispanics/Latinos, and MSM; ensure the inclusion of HIV vaccine research information in prevention, care, and treatment programs; eliminate myths, misconceptions, misperceptions, and misinformation relating to HIV prevention vaccine research; and measure the effectiveness of campaign messages.

An additional challenge is the recruitment of underrepresented minority investigators to AIDS and AIDS-related clinical and basic research disciplines. To address this challenge, NIAID supports a comprehensive portfolio of biomedical and behavioral research aimed at preventing and treating HIV disease in minority communities, training minority investigators, and fostering infrastructure development. NIAID continues to co-fund, with the National Center for Research Resources, the Research Centers in Minority Institutions (RCMIs) program by providing support for HIV/AIDS research pilot projects as well as infrastructure development at RCMIs. In FY 2004, NIAID awarded projects to seven institutions for research in diverse areas such as clinical, molecular, and vaccine development; drug development; opportunistic infections; immunology; and two comprehensive centers for health disparities.

In addition, NIAID awards grant supplements under the Research Supplements for Underrepresented Minorities (RSUM) program. The purpose of RSUM is to attract underrepresented minority investigators into biomedical and behavioral research. The supplements are made to NIAID-funded grantees to recruit and support investigators interested in a particular area of scientific research. The awards are made on behalf of postdoctoral candidates, graduate students, faculty members, undergraduates, and reentry and disabled investigators. Several of the NIAID-sponsored Centers for AIDS Research also have a significant commitment to educating and training minority investigators and providing outreach to minority communities.

Sexually Transmitted Infections. Sexually transmitted infections (STIs) are critical global and national health priorities because of their devastating impact on minorities, women, and infants and their causal association with HIV infection. STIs are widespread, with 19 million new cases estimated to occur each year in the United States.[48] Several STIs, including genital herpes, gonorrhea, chlamydia, and syphilis, have higher incidences among minorities than among Whites in the United States.[49]

Symptoms of STIs in women can be minor or nonspecific, especially in the early stages, and are often not diagnosed until late in the disease. STIs that occur during pregnancy can affect the fetus or newborn. About one-quarter to one-half of women infected with an STI during pregnancy gives birth to either premature or low birth weight infants. In about one-third to two-thirds of these pregnancies, the infection is passed to the infant and can cause permanent disabilities. Chlamydia, gonorrhea, and other infections of a woman's upper reproductive tract also can complicate pregnancy.

Chlamydia is the most commonly reported sexually transmitted bacterial disease in the United States, with an estimated 3 million new cases each year. The rate of reported infection with *Chlamydia trachomatis* is greater among women than men, and is particularly high in adolescent women. In women, chlamydial infections can cause pelvic inflammatory disease, which is a major cause of infertility, ectopic pregnancy, and chronic pelvic pain.[50] NIAID is currently planning to conduct a three-site trial

in Madagascar to test the effectiveness of the diaphragm to prevent chlamydial and gonococcal infection in women. This study is scheduled to begin in early 2005.

Genital herpes affects at least 45 million people in the United States. About 1 in 5 adults in the United States has genital herpes, but only one-third of these people know they have the virus. Although most genital herpes cases present no symptoms, asymptomatic individuals can transmit herpes simplex virus (HSV type 1 or 2) to others, and a pregnant woman infected with HSV can transmit the virus to her baby.[51] NIAID is investigating treatments for herpes, including antiviral drugs and monoclonal antibodies, as well as studies to assess the role of antiviral suppressive therapy and vaccination in decreasing herpes transmission. In FY 2003, NIAID launched a pivotal phase III double-blind clinical efficacy trial of Herpevac, an investigational vaccine for the prevention of genital herpes in women ages 18 to 30. This trial, called the Herpevac Trial for Women, has expanded from 25 sites to 35 sites across the United States and is being conducted as a public-private partnership with GlaxoSmithKline, utilizing NIAID clinical sites. (For more information about the Herpevac Trial for Women, see: *http://www.niaid.nih.gov/dmid/stds/herpevac/default.htm*.)

Group B Streptococcus (GBS) is another infectious bacterium that is harmful to women and can be passed to their unborn children; it is the most common cause of life-threatening infections in newborns. Approximately 25 percent of pregnant women carry GBS bacteria in their vagina or rectum, although most women do not experience symptoms.[52] NIAID is currently supporting a GBS vaccine research study called the Streptococcal Prevention in Non-Pregnant Women Study to determine whether a single vaccination with an investigational GBS type III vaccine can prevent non-pregnant women from acquiring GBS type III bacteria in their reproductive tract. There are several types of GBS; type III is being studied because it is common in newborn infections.

Syphilis is caused by *Treponema pallidum*, a bacterium that is most commonly transmitted through sexual activity. It is possible for pregnant women with the disease to pass the bacterium to their unborn children, which can cause serious mental and physical disorders. Although the number of cases of syphilis is declining in the United States, in 2002, young women 20 to 24 years of age and men 35 to 39 years of age had the highest incidence of syphilis.[53] The NIAID-supported STD Clinical Trials Unit is currently conducting a randomized phase III trial to evaluate the equivalency of oral azithromycin versus injectable benzathine penicillin for treatment of primary syphilis. If successful, this could provide an additional antimicrobial strategy for treatment of this difficult disease.

Trichomoniasis is also common in the United States. Trichomoniasis is caused by a single-celled protozoan parasite called *Trichomonas vaginalis*. Although this common STI affects both women and men, symptoms are most common in women, with the highest incidence of this disease (in the United States) occurring in women between the ages of 16 and 35.[54] The NIAID-supported STD Clinical Trials Unit recently completed a multisite clinical study to determine the concordance of trichomoniasis between male and female partners. Researchers plan to publish these results in the near future.

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. These activities are part of an overall Institute effort to initiate and support a variety of other research projects that focus on: (1) developing vaccines, topical microbicides, and treatments for the microbes that cause STIs; (2) developing better and more rapid diagnostics; (3) sequencing the genomes of sexually transmitted pathogens; and

(4) understanding the long-term health impact of sexually transmitted pathogens in various populations. (For more information about the NIAID research program on sexually transmitted diseases, see: *http://www.niaid.nih.gov/dmid/stds.*)

The NIAID Topical Microbicides Program could be particularly important for protecting the health of women and children. A topical microbicide is a preparation (e.g., gel, cream, or foam) that is applied to the vagina or rectum to inactivate or inhibit STI pathogens, including HIV, that are being transmitted by either sexual partner. The majority of these infections are acquired through sexual intercourse, which underscores the need for developing a safe, effective, topically applied chemical and/or biologic barrier to prevent sexually transmitted HIV infection. Effective topical microbicides also might help prevent many other STIs. The ideal microbicide would be safe and nonirritating to the mucosal tissues, even if used on multiple occasions in a short period of time; inexpensive and unobtrusive; and available in both spermicidal and nonspermicidal formulations, so that women would not have to put themselves at risk for acquiring HIV and other STIs in order to conceive a child.

Transplantation. Transplantation represents a key health disparity for African Americans, who are at an increased risk for end-stage organ failure and the need for transplant. Despite a disproportionate representation on organ transplant waiting lists (27.1 percent of the total and 35.4 percent of kidney waiting list candidates), African Americans comprised only 18.2 percent of transplant recipients in 2003. In contrast to these disparities, African Americans, who make up approximately 13 percent of the U.S. population, accounted for 13.3 percent of all donors in 2003. (For more information about data on transplantation, see: *http://www.optn.org/data.*)

For reasons that are not well understood, African Americans experience lower survival rates after transplantation and higher incidences of acute graft rejection and long-term immunosuppression-related adverse effects than do Whites. These disparities could be related to genetic factors, immunological factors, differences in drug pharmacokinetics, access to healthcare, socioeconomic factors, and medical noncompliance. To clarify the genetic factors that result in variable graft survival among populations, NIAID and the NIDDK launched the Genomics of Transplantation Cooperative Research Program in FY 2004. Researchers in this program will examine genetic polymorphisms and gene expression patterns in order to understand and predict transplant outcomes in diverse populations.

For kidney transplantation, matching of histocompatibility antigens (proteins that are the major targets of immune-mediated graft rejection) between donors and recipients is a consideration in prioritizing the distribution of organs. Because of racial or ethnic differences in the frequency of alleles (variants of a gene) at human leukocyte antigen (HLA) loci, African Americans are less likely to find a good match in the donor kidney pool than are candidates from other racial or ethnic groups, and the rate of graft failure is proportional to the level of mismatching.[55] These findings also apply to bone marrow transplantation, where HLA mismatching increases the risk of graft failure and graft versus host disease.[56] To increase knowledge of HLA diversity and improved donor-recipient matching, NIAID supports research to identify new HLA alleles in distinct racial and ethnic groups. NIAID-supported researchers have discovered 13 new HLA alleles in African Americans, 3 new alleles in Native Alaskan Yup'iks, and 2 new alleles in Lakota Sioux. In addition to facilitating improved donor-recipient matching in organ and hematopoietic stem cell transplantation, this research may provide additional insights into the origin and diversity of humans. (For more information about policies related to matching organ donors and recipients,

see: *http://www.optn.org/policiesAndBylaws/policies.asp*.)

Tuberculosis. Tuberculosis (TB), which is caused by the bacterium *Mycobacterium tuberculosis* (*M. tb*), is one of the leading causes of illness and death in the world, and kills more people than AIDS and malaria combined. The World Health Organization estimates that approximately one-third of the world's population is infected with *M.tb*, approximately 8 million new TB cases occur annually, and 2 million people die each year from TB.[57]

TB also remains a public health concern in the United States. The CDC estimated that 5 to 10 percent of the U.S. population (14 to 28 million persons) was infected with TB and in 2003, and 14,871 new TB cases occurred in the 50 States and the District of Columbia.[58] The disease persists disproportionately among racial/ethnic minority populations in the United States. During 2003, approximately 53.3 percent of the reported active TB cases in the United States were among foreign-born persons. Within minority populations, the largest number of reported TB cases occurred in non-Hispanic Blacks (45 percent of minority cases).[59] Combined factors such as urban poverty, high HIV infection rates, and the effects of household crowding might contribute to the disproportionate impact of TB on minorities. Also, the rise of multidrug-resistant strains of TB and co-infection with HIV has further extended the impact of TB in the United States and around the world.

Over the past decade, dramatic increases in NIAID funding for TB research have allowed the Institute to support a wide range of TB initiatives and to increase the community of TB researchers. In FY 2004, NIAID awarded a contract to Colorado State University to continue to provide TB research reagents to qualified investigators throughout the world, enabling them to work with consistent, high-quality microbiological, immunological, and genomic reagents. This contract will also enable exploratory and preclinical evaluation of promising new TB vaccine candidates in state-of-the-art animal models. NIAID also continues to support international clinical studies of TB/HIV co-infection, with active Institute program staff participation on projects in Africa, Asia, and South America. A high-priority goal of the Institute's research program is the development of improved TB vaccines.

In addition, NIAID continues to support the Tuberculosis Research Unit at Case Western Reserve University, which conducts multidisciplinary laboratory and clinical studies to answer critical questions about human TB; provides knowledge, tools, and technologies to improve TB clinical trials; and offers the ability to conduct clinical studies for the evaluation of new or improved vaccines, therapeutics, and diagnostics. (For more information about the Tuberculosis Research Unit at Case Western Reserve University, see: *www.tbresearchunit.org*.)

Minority Researchers' Training Programs

Increasing the participation of underrepresented minority investigators in virtually all fields of biomedical research is a continuing NIH and NIAID priority. In addition to supporting NIH-wide programs, NIAID has developed and supported a variety of innovative minority programs for biomedical research, encompassing high school through postdoctoral training.

In FY 2004, NIAID continued its extramural arm to its longstanding Introduction to Biomedical Research Program. The Richard M. Asofsky Scholars In Research (ASIR) award was created to represent and honor Dr. Asofsky's dedication to bringing underrepresented minorities into the biomedical sciences. The ASIR program provides supplemental funding to NIAID extramural principal investigators for the purpose of supporting underrepresented minority high school and college students in their research

laboratories and to expose them to research career opportunities in the areas of allergy, immunology, transplantation, microbiology, and infectious diseases, including AIDS. These NIAID ASIR awards are used to encourage the development of underrepresented minority researchers as outlined in the NIAID *Strategic Plan on Health Disparities*. (For more information about the Richard M. Asofsky Scholars In Research award, see: *http://grants2.nih.gov/grants/guide/pa-files/PAR-03-071.html.*)

In FY 2004, NIAID announced an initiative, Enhancement Awards for Underrepresented Minority Scientists, to solicit applications from underrepresented minority investigators who are in the early stages of their scientific careers (assistant professor or junior-level faculty) to establish basic or clinical research programs in the areas of allergy, immunology, transplantation, microbiology, and infectious diseases, including AIDS. The goals of the program are to increase the number of underrepresented minority investigators performing independent, competitive research in the areas encompassed by NIAID's scientific mission and to enhance the long-term research skills and potential of these individuals. NIAID received 57 applications under this initiative. (For more information about the Enhancement Awards for Underrepresented Minority Scientists, see: *http://grants1.nih.gov/grants/guide/rfa-files/RFA-AI-03-045.html.*)

Since 1993, NIAID has conducted a symposium designed for recipients of the Research Supplements for Underrepresented Minorities to encourage them to continue studies related to NIAID's biomedical research agenda. In November 2003, NIAID held its sixth Bridging the Career Gap for Underrepresented Minority Scientists symposium with 70 attendees. (For more information about the symposium, see: *http://www.niaid.nih.gov/osprt/bridging_the_career_gap.htm.*)

In February 2004, NIAID's Division of Intramural Research (DIR) Office of Training and Special Emphasis Programs (OTSEP) held its second annual outreach program for underrepresented minorities in the biomedical sciences. This 5-day program on Intramural NIAID Research Opportunities (INRO) included scientific lectures by NIAID researchers, discussions with scientists, and tours of the Research Technologies Branch and the Vaccine Research Center (VRC). Three key features distinguish this new program and will result in more minority students participating in intramural training programs at all levels. Eventually, this programmatic strategy will create a larger pool of potential candidates for career positions in NIAID. First, the selection of students is based on academic excellence, interest in NIAID research, and desire to participate in NIAID's DIR training programs. Second, current DIR minority trainees are included in all aspects of the program and are invited to give presentations. This allows the visiting students to see first-hand what can be accomplished and to network with the trainees. Third, all participants will be tracked in future years to inform them about NIAID training and professional opportunities and to enlist their participation in OTSEP's outreach activities.

In FY 2004, the OTSEP Underrepresented Minority Programs were fully subscribed for the postbaccalaureate Intramural Research Training Awards (IRTA) traineeships; the first minority graduate student was selected for OTSEP sponsorship; one female postdoc, recruited from the University of Virginia, began her 2-year sponsorship; and three minority postdocs continued their research in DIR and one in the VRC. Upon completion of their DIR training, most OTSEP-sponsored trainees begin graduate or medical school.

A nationwide marketing strategy proved highly successful in promoting INRO 2004. Historically Black colleges and universities were targeted for outreach. As a result of these activities, the number of qualified applicants increased, and 10 INRO 2004 participants were offered training

positions in DIR labs—postbaccalaureate IRTA and Summer Internship Program. Eight of these students have begun their laboratory traineeships.

Another program in which NIAID staff members participate, the Summer Medical Education Program, is sponsored by the Robert Wood Johnson Foundation and is targeted to minority students who plan to attend medical school. In FY 2003, 400 students at the Case Western Reserve University, University of Virginia, and Yale University Student Medical Education Program attended presentations to learn about INRO 2005 and DIR training opportunities. (For more information about the Summer Medical Education Program sponsored by the Robert Wood Johnson Foundation, see: *http://www.rwjf.org/portfolios/resources/grant.jsp?id=050019&iaid=135*.)

Research Guidelines

In all clinical research, including biomedical and behavioral studies, NIAID complies with the 1993 NIH *Guidelines on the Inclusion of Women and Minorities as Subjects in Clinical Research*. Congress mandated the establishment of these guidelines in the NIH Revitalization Act of 1993, and NIAID staff members participated in their development. The guidelines stipulate that women and members of minority groups must be included in all NIH-supported research projects involving human subjects, unless there is a compelling reason that such inclusion would be inappropriate. The guidelines also state that women of childbearing potential should not be routinely excluded from participation in clinical research.