Justification

National Institute of Allergy and Infectious Diseases

Authorizing Legislation: Section 301 and title IV of the Public Health Service Act, as amended.

Budget Authority:

FY 2006 Actual		FY 2007 Continuing Resolution		FY 2008 Estimate		Increase or Decrease	
FTE	BA	FTE	BA	FTE	BA	FTE	BA
1,589	$4,379,199,000	1,617	4,382,038,000	1,639	4,592,482,000	+22	210,444,000

The following narrative provides justification for the Fiscal Year 2008 research activities of NIAID. It is organized into three major categories: HIV/AIDS, Biodefense, and Infectious and Immunologic Diseases. A more detailed description of NIH-wide Fiscal Year 2008 HIV/AIDS activities can be found in the Office of AIDS Research (OAR) section of the Overview Volume One. Details on the Roadmap/Common Fund are located in the Overview, Volume One.

NIAID FY 2008 Congressional Justification Director's Statement

The mission of the National Institute of Allergy and Infectious Diseases (NIAID) is to conduct and support research to understand, treat, and prevent infectious and immune-related diseases. Infectious diseases include well-known killers such as HIV/AIDS, tuberculosis and malaria, emerging or re-emerging threats such as influenza and extensively drug-resistant tuberculosis (XDR-TB), and "deliberately emerging" threats from potential agents of bioterrorism. Immune-related disorders include autoimmune diseases such as rheumatoid arthritis, as well as asthma, allergies, and problems associated with transplantation.

To accomplish that mission, NIAID not only conducts a comprehensive research program on infectious and immune-meditated diseases, it also must respond quickly to new infectious disease threats as they arise. Recent growth in the NIAID research portfolio has been in part driven by unprecedented scientific opportunities in microbiology, immunology, and infectious diseases, and in part by the growing realization that research is a key to meeting challenges such as HIV/AIDS, the threat of emerging diseases and bioterrorism, and other infectious and immunologic diseases, such as the increased prevalence of asthma among children. NIAID has undertaken a comprehensive effort to renew its strategic plan, originally published in 2000 under the title *NIAID: Planning for the 21st Century*. The new plan will include biodefense as well as HIV/AIDS and other infectious and immunologic diseases research.

HIV/AIDS

In the 25 years since publication of the first scientific reports of on Acquired Immune Deficiency Syndrome (AIDS), the disease has become the deadliest pandemic of our generation and one of the worst in history. In the year 2006 alone, approximately 4.3 million people worldwide, half of them women, became infected with Human Immunodeficiency Virus (HIV), and about 2.9 million people with HIV/AIDS died. Although more than 95 percent of these infections and deaths occurred in developing countries, in the U.S. approximately 1 million people are living with HIV infection, and 40,000 new infections occur each year.[1]

The return on the continuing investment Congress has made in AIDS research since the mid-1980s has been extraordinary. The initial identification of HIV as the cause of AIDS was quickly followed by development of a test to identify infected individuals and screen the blood supply. Scientists rapidly uncovered the structure and genetic organization of HIV and began to understand its disease-causing mechanisms. These advances facilitated the rapid development of an array of potent anti-HIV drugs that have saved at least 3 million years of life in the U.S. alone,[2] and prevented a large number of cases of mother-to-child transmission worldwide.

To defeat the AIDS pandemic, however, we must develop vaccines or other highly effective means of preventing virus transmission. Many vaccine candidates have either already begun or will soon enter human clinical testing, as will candidate topical microbicides intended to prevent sexual transmission of the virus. To conduct the complex human trials needed to test candidate vaccines and microbicides more efficiently, NIAID recently reorganized its HIV/AIDS Clinical Trial Networks. Because many countries most affected by the HIV pandemic have little public health or medical care delivery infrastructure, NIAID has also expanded its partnership with researchers in countries that bear the brunt of the AIDS pandemic.

Biodefense and Emerging Infectious Diseases

In the aftermath of the terrorist attacks of 2001, NIAID developed a Strategic Plan for Biodefense Research that outlines three essential pillars of the NIAID biodefense research program: infrastructure for research on dangerous pathogens; basic research on microbes and host immune defenses; and milestone-driven development of vaccines, therapeutics and diagnostics that we would need to combat a bioterror attack or the emergence of a new disease.

Implementation of this plan has already enhanced our preparedness for deliberately caused bioterror incidents and naturally occurring emerging infectious diseases alike. Many new medical countermeasures against specific biological threats such as H5N1 influenza viruses have been developed, clinically tested, and in some cases added to the national pharmaceutical stockpile. Several bio-safety level 3 and 4 laboratories, which safely contain pathogens used in research, are now completed or under construction. Considerable progress has been made in understanding the interactions between biodefense pathogens and their human hosts; however, this continues to be a priority research area. For example, NIAID has conducted numerous successful clinical tests in healthy children, adults, and seniors of H5N1 vaccines based on the viruses currently

[1] UNAIDS/WHO AIDS Epidemic Update: December 2006. Accessed 12/11/06 at http://www.unaids.org/en/HIV_data/epi2006/default.asp.

[2] RP Walensky et al. The survival benefits of AIDS treatment in the US, J Infect Dis.194:1, 2006.

infecting humans; although these "pre-pandemic" vaccines will be reformulated should a pandemic H5N1 virus emerge, the results indicate that effective vaccines are possible. Moreover, basic scientific advances now allow us to go beyond developing countermeasures against individual threats and work toward development of technologies to counter multiple threats. These include vaccines created by inserting genes from various pathogens into a well-characterized vaccine platform and interventions based on stimulating non-specific, "innate" immune defenses that combat a wide array of viruses and bacteria.

Infectious and Immunologic Diseases

The diverse array of infectious and immunologic diseases has been the domain of NIAID research since the institute was established in 1955. NIAID's efforts to create the vaccines, drugs, and diagnostic tools that are the ultimate objective depend on a firm foundation of basic research into the fundamental biological properties of pathogens and the intricate mechanisms the human immune system uses to defeat them.

Despite advances in medicine and public health such as antibiotics, vaccines, and improved sanitation, infectious diseases still account for 26 percent of all deaths worldwide, including approximately two thirds of all deaths among children under five years of age[3]. Just two diseases alone, malaria and tuberculosis, kill millions every year[3]; the emergence of XDR TB, which is resistant to almost every available antibiotic, threatens to make matters even worse. Although scientists have made enormous strides in recent years in understanding the often deadly interactions between pathogens and people, there is much more to learn that would greatly enhance our ability to create new, better countermeasures.

NIAID supports many research activities intended to foster new treatments for immunologic and infectious diseases; much of this work is done collaboratively with industrial and non-governmental partners to leverage resources and speed product development, such as NIAID's role in the first clinical trial of a malaria vaccine in decades. Many immune-mediated problems, including autoimmune disorders and transplant rejection, are the result of the immune system targeting cells or tissues inappropriately. In an ongoing effort to target these diseases, NIAID in FY 2007 will re-compete the Immune Tolerance Network (ITN), a consortium of investigators in the U.S., Canada, Western Europe, and Australia dedicated to the clinical evaluation of therapies that cause autoimmune patients' immune systems to tolerate the tissues that are being inappropriately attacked. Tolerance-inducing therapies could also be useful in preventing transplant rejection and in alleviating allergic diseases.

The contributions of multilateral institutions and international organizations to combating HIV/AIDS provide a vital opportunity for a comprehensive response to the disease. The diverse drivers and consequences of HIV/AIDS, as well as its complex interactions with a variety of other social, political, and economic circumstances demand leadership from diverse international partners with varied expertise. As part of the President's Emergency Plan for AIDS Relief (PEPFAR), the Administration requests a total of $300 million within the HHS National Institutes of Health (NIH) budget for a contribution to the Global Fund to fight HIV/AIDS, Malaria, and Tuberculosis.

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[3] WHO World Health Report, 2005; accessed 12/11/06 at http://www.who.int/whr/en/

NIAID FY 2008 Congressional Justification Narrative

Overall Budget Policy. NIAID supports basic and applied research to prevent, diagnose, and treat infectious and immune-mediated illnesses, including illness from agents with bioterrorism potential, human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS), tuberculosis, malaria, autoimmune disorders, asthma, and allergies. Investigator-initiated basic research has long been the mainstay of NIAID's research program, and provides the scientific foundation on which new medical interventions are built. In addition to scientific discovery, however, NIAID must respond to infectious disease threats as they emerge with targeted development of new vaccines, therapies, and diagnostic technologies. The challenge is to balance these two aspects of the NIAID role in protecting the Nation's health, fully supporting the basic scientific discoveries on which future advances will depend while catalyzing countermeasure development. In the process, NIAID maintains the highest standards of peer review of grant applications and works to ensure that the next generation of scientists receives needed training and support.

HIV/AIDS

The ultimate goal of all NIAID HIV research is the creation of effective means to treat and prevent HIV infection. According to recent UN estimates, about 39.5 million people worldwide are infected with HIV; this number is expected to grow substantially in coming years. NIAID maintains a comprehensive portfolio of basic research to elucidate the pathogenesis, natural history, and transmission of HIV disease, and supports research that promotes progress in HIV diagnosis, treatment, and prevention. NIAID accomplishes this through planning, implementing, managing, and evaluating programs in basic research, as well as discovery and development of therapies for HIV infection and its complications, HIV vaccines, and non-vaccine prevention strategies. The combination of basic HIV research and collaborations with industrial partners to translate these finding into treatments has led to the licensure of therapies that greatly improve the outlook for HIV-infected people. NIAID, however, continues to support the discovery and development of new therapeutic targets that are less toxic and have fewer side effects and are readily accessible, particularly in resource-limited settings. On the prevention side, HIV vaccines represent the best hope of ending the HIV pandemic, and developing safe and effective HIV vaccines remains one of NIAID's highest priorities. Many vaccine candidates are in pre-clinical development, and 19 are currently in clinical testing. Until effective vaccines are available, however, non-vaccine prevention strategies, such as the development of topical microbicides that can prevent infection, will be critical to curbing the continued spread of the virus. Research-based prevention strategies based on behavior modification have already contributed to the maintenance of low infection rates in a number of settings and to declining HIV epidemics in specific populations around the world. NIAID's strong network of sites at which clinical trials and research is conducted, both domestically and overseas, is an essential element of efforts to develop new HIV treatment and prevention strategies. NIAID recently reorganized the HIV Clinical Trials Network in order to expand its clinical research capacity, improve efficiency and flexibility, and create a more integrated and collaborative structure.

Budget Policy. The NIAID FY 2008 budget proposal for HIV/AIDS research is $1.250 billion, a increase of 0.5 percent from the FY 2007 estimate of $1.244 billion. The FY 2008 AIDS research plan was carefully crafted to support long-range strategic priorities for AIDS research. The plan carefully balances support of high-priority research initiatives in AIDS research which support the best investigator-initiated research. A critical focus of the FY 2008 AIDS research plan is the continued support for development of new, high-priority prevention strategies, including the development and testing of new vaccines and topical microbicides. Key activities include: the continuing realignment of the AIDS clinical networks to more effectively support the clinical testing and evaluation of AIDS vaccine and microbicide candidates, particularly in developing countries where the pandemic is most prevalent; expansion of research support to develop new strategies for prevention of HIV infection; and the recompetition of the Women's Interagency HIV Study, a collaborative, multi-site, natural history study of the long-term biological and psychological impact of HIV infection on women, particularly minority women.