



## Confronting Infectious Diseases— America's Medical Schools and Teaching Hospitals

Diphtheria, malaria, typhoid, polio, hepatitis C, HIV/AIDS, tuberculosis, SARS, smallpox, avian flu.

The list of infectious diseases that emerge and re-emerge challenges researchers, clinicians, and the public health community to continually develop more effective preventions and treatments. For decades, the National Institutes of Health (NIH) and America's medical schools and teaching hospitals have worked together to stop the spread of infectious diseases through new knowledge, better treatments, and life-saving vaccines.

Following are some recent examples of NIH-funded research advances achieved at the nation's medical schools and teaching hospitals to halt infectious diseases:

### 2006

Discovered how and where *Listeria* bacteria invade cells in the intestine. *Listeria* can cause potentially fatal infections in the blood or brain, or miscarriages in pregnant women. This discovery will enable scientists to develop better ways to protect against the disease.

**Stanford University School of Medicine**  
**NIH-funded**

### 2005

Discovered a genetic marker that may identify individuals at greater risk of life-threatening infection from the West Nile virus. Understanding who is susceptible to West Nile could help identify those most in need of a vaccine, when one is developed.

**Baylor College of Medicine**  
**University of Texas School of Public Health at Houston**  
**NIH-funded**

A novel 3-D imaging technique has revealed, for the first time, the brain damage inflicted by AIDS. However, it also showed that the antiretroviral drugs used to protect the immune system from HIV do not protect the brain, demonstrating the need for improved therapeutics.

**David Geffen School of Medicine at UCLA**  
**University of Pittsburgh School of Medicine**  
**NIH-funded**

Developed a novel viral vector method of producing vaccines in only six weeks – four to six times faster than usual. Reducing vaccine production time will help to curb disease outbreaks before they reach pandemic proportions. Using this method, a vaccine against avian flu was created, and preliminary animal testing has shown its efficacy in significantly reducing symptoms.

**University of Pittsburgh School of Medicine**  
**NIH-funded**

Developed an animal model of Lyme disease making it possible to conduct a study of how it affects the nervous system and to develop, patent, and obtain FDA/USDA approval of a diagnostic test now poised to replace the current diagnostic protocol used in humans.

**Tulane University Health Science Center**  
**NIH-funded**

Led a nationwide study that proved the safety and efficacy of an acellular vaccine for whooping cough (pertussis) in adults and adolescents.

**University of Rochester Medical Center**  
**NIH-funded**

Developed a DNA vaccine for Chlamydia pneumoniae. This vaccine may eliminate the organism from the respiratory tract and thereby reduce morbidity and mortality of diseases such as atherosclerosis, heart disease, chronic obstructive pulmonary disease, and asthma associated with infection by this organism.

**The University of Texas Health Center at Tyler**  
**NIH-funded**

## **2004**

Discovered new information about how viral proteins move between cells and alert the immune system, suggesting that a double-punch approach to vaccine design could lead to more effective vaccines.

**Pennsylvania State University College of Medicine**  
**NIH-funded**

Created an early detection method for respiratory syncytial virus, the major cause of hospitalization among children under 5. It detects viral particles in hours, not days.

**Vanderbilt University Medical Center**  
**NIH-funded**

Created a virtual computer model to visualize what happens in the lungs after the inhalation of the bacterium that causes tuberculosis. The computer simulation revealed new information about how the immune system is able to contain the spread of the bacteria that is normally impossible to see in humans or animals.

**University of Michigan Medical School**  
**NIH-funded**

In the largest comparison of AIDS treatments involving multiple drugs given together, researchers found that one specific combination was the most effective way to combat HIV. The “cocktail” included AZT, Efavirenz, and Zidovudine. Clinicians now know that the most effective way of treating HIV is while the virus is still vulnerable and before it takes its toll on the immune system.

**Stanford University School of Medicine**  
**NIH-funded**

Discovered that half of the HIV-positive patients in a small study were able to live medication-free for more than a year without developing AIDS-related illnesses. A reduced drug regime could provide some patients with a healthier quality of life and enable twice as many people to be treated for the same cost while being exposed to fewer toxic side effects from the drugs.

**Stanford University School of Medicine**  
**NIH-funded**

Led a national study of more than 1,000 participants that showed that a flu vaccine used in other parts of the world is also safe and effective in the United States.

**University of Rochester Medical Center**  
**NIH-funded**

**2003**

Discovered the role of T-helper cells in controlling infection by a tumor virus.

**Ohio State University College of Medicine and Public Health**  
**NIH-funded**

Proved that drugs aimed at preventing HIV transmission may be an effective way to reduce the incidence of HIV in places where the epidemic is rampant and where condom use is prohibited. Specifically, researchers discovered that vaginal transmission of the HIV virus among primates could be completely prevented when specific drugs were added to the vagina shortly before addition of the virus.

**Tulane University School of Medicine**  
**NIH-funded**

Created methods to replicate the hepatitis C virus in two human cell lines, enabling the development of novel therapies to treat chronic hepatitis C infection and ways to reduce the potential risk of developing liver cirrhosis and liver cancer.

**Tulane University School of Medicine**  
**NIH-funded**

Identified, using genomic and proteomic technology, all of the genes and proteins involved in anthrax infection, providing valuable new information for potential vaccine development and new targets for treatment.

**University of Michigan Medical School**  
The Institute for Genomic Research  
Scripps Research Institute  
**NIH-funded**

**2002**

Discovered a novel genetic trait that protects its carriers from the deadliest forms of malaria, while people without the trait are more likely to succumb to its fatal consequences.

**Duke University School of Medicine**  
**NIH-funded**

For more information about how medical schools and teaching hospitals are fulfilling the promise of medical research, go to: [www.aamc.org/ftp](http://www.aamc.org/ftp)