VACCINE DEVELOPMENT: A HISTORY OF SUCCESS

The Wistar Institute’s half-century of achievement in vaccine development has saved countless lives in the United States and around the world. Discoveries at Wistar have led to the creation of vaccines that protect children and adults from widespread, debilitating, and life-threatening diseases.

RUBELLA: Ending a Pandemic

Thanks to a Wistar vaccine, rubella – also known as German measles – no longer threatens the health of U.S. babies. Professor emeritus Stanley A. Plotkin, M.D., began work on the vaccine during the 1960s after a rubella pandemic swept across the United States and Europe and left some 12,000 infants deaf, blind, or with both impairments. His vaccine became available in 1969 and gained widespread use in industrialized nations, sending the rubella infection rates into rapid decline. In 2005, the Centers for Disease Control and Prevention declared rubella eradicated in the United States, crediting Dr. Plotkin’s vaccine.

In developing nations, however, rubella remains a threat. In countries without strong mass vaccination programs, rubella outbreaks still cause severe birth defects, miscarriages, and stillbirths. Wistar has licensed the rubella vaccine seed stock to companies in China, India, and Russia. The agreements, which do not bring significant royalties to the Institute, are designed to help these countries develop affordable vaccines to protect their populations.

RABIES: Preventing Lethal Infection

Two Wistar vaccines play an important role in preventing rabies infections, which are almost always fatal. One vaccine protects people bitten by a rabid animal. When given promptly as part of post-exposure treatment, it is nearly 100 percent effective in preventing infection. The vaccine is also given to those at high risk of exposure, including veterinarians and wildlife officers. The second vaccine prevents rabies in wildlife and it is used worldwide to protect not only wild animals but also, indirectly, neighboring human populations.
Wistar researchers have developed a novel vaccine against human immunodeficiency virus (HIV), a growing epidemic that has infected some 40 million people worldwide. This research, supported by the National Institutes of Health, is currently in the preclinical testing stage and is scheduled to move into clinical trials soon.

The vaccine is based on an innovative “vector” or carrier developed by Hildegund C. J. Ertl, Ph.D., a Wistar professor and director of Wistar’s Vaccine Center. The vector, based on a chimpanzee adenovirus, carries genes that encode HIV-1 proteins, which do not cause disease but will stimulate the immune system. Unlike adenovirus vectors used in recent failed trials, the Wistar vaccine will not be neutralized by the immune system, since the adenovirus used is not common among humans.

The vaccine, which protects against the highly contagious virus was approved and became part of the recommended vaccine schedule for U.S. babies in 2006. It is used in 16 countries and is approved in 30 more. The vaccine was co-developed by three scientists at Wistar and Children’s Hospital of Philadelphia (CHOP) in the 1980s: H. Fred Clark, D.V.M., Paul A. Offit, M.D., currently chief of infectious diseases at CHOP, and Stanley A. Plotkin, M.D., now a Wistar professor emeritus.

HIV: Stopping the Modern Scourge

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HPV: Treating Cervical Cancer with a Vaccine

While vaccines against human papillomavirus (HPV) are safe and effective, they do not protect the majority of adult women who are already infected with the virus. HPV is the primary cause of cervical cancer, one of the deadliest cancers for women worldwide, and Wistar has developed the first therapeutic vaccine to the disease. The vaccine spurs the immune system into attacking infected cells, such as cervical cancer tumors, that exhibit HPV proteins. The HPV vaccine, also based on Dr. Ertl’s unique vector technologies, is currently undergoing preclinical trials in collaboration with a Chinese biotechnology company and Tianjin Medical University Institute and Hospital, the premier cancer hospital in China.