AIDS Vaccine Development in Japan

The Sendai Virus Vector Project

More than twenty-six years have passed since the discovery of HIV as a cause of AIDS, and the global pandemic continues to outpace the global response. Last year alone, there were more than four million new infections, with most of those infected living in developing countries. The international community has made significant strides in expanding prevention, treatment and care, but the HIV pandemic continues to take its toll. There is an urgent need to develop a new, effective preventive technology, such as an AIDS vaccine, as part of a comprehensive response to HIV/AIDS.

The International AIDS Vaccine Initiative (IAVI) is a unique type of non-governmental organization (NGO)—a public-private partnership which unites the public sector's commitment and resources with the private sector's expertise and technology to accelerate the development of an AIDS vaccine for use throughout the world. Since its inception in 1996, IAVI has tested six candidate vaccines and raised nearly half a billion dollars in new funding for AIDS vaccine research and development (R&D).

In the summer of 2007, a new partnership between IAVI and Japanese researchers was launched with the goal of jointly developing a preventive vaccine for AIDS using the recombinant Sendai virus (SeV) vector. IAVI's first collaborative project in Japan, the SeV program may prove a crucial innovation in AIDS vaccine development. The SeV-based AIDS vaccine candidate, having demonstrated its ability to induce cell-mediated immunity in animals, has the potential to be efficacious and elicit mucosal immune responses in people. Scientists believe that mucosal immune responses may be particularly effective in AIDS vaccines as the mucosal surfaces are the site of early HIV infection. The SeV candidate will be the first candidate in people to test this hypothesis. Sendai, which serves as a basis of the vector, is an RNA virus that does not cause disease in humans. It is capable of efficiently delivering genes expressing HIV proteins to the immune system and of replicating safely in the upper airway.

The SeV vector technology was jointly developed in the 1990s by Dr. Yoshiyuki Nagai (currently with Riken), who was then at the University of Tokyo Institute of Medical Science (IMS) and DNAVEC Research Institute (currently DNAVEC Corporation) in Tsukuba City, based on technology conceived by Dr. Nagai. This technology was applied to AIDS vaccines by Dr. Tetsuro Matano (currently at IMS), who was then at the Japanese National Institute of Infectious Diseases. The preliminary data from joint research with DNAVEC successfully demonstrated the efficacy of the vector for use in AIDS vaccines. In a non-human primate study, monkeys were protected against SIV, a virus that causes a disease that is much like AIDS, if vaccinated intra-nasally using a recombinant SeV vaccine candidate. This joint research is ongoing and is taking place at the University of Tokyo IMS.

The collaboration between IAVI and Japanese partners has a goal of advancing into clinical use the fruit of basic research on AIDS vaccines in Japan. It is anticipated that the candidate will advance to human clinical trials within the next three years. The project includes pre-clinical testing for immunogenicity and safety, process development for manufacturing and a Phase I clinical trial for the candidate. The possibility of further development will be evaluated after the results of early testing.

If successful, the SeV vector-based AIDS vaccine will be the first candidate developed in Japan that will advance to human clinical trials. Marshalling scientific talent and resources from every corner of the globe is critical to the design of effective and long-term approaches to HIV prevention. Japanese science and technology, as demonstrated by the SeV vector, is expected to play a larger role in the global search for a vaccine to end AIDS in upcoming years.

About IAVI

The International AIDS Vaccine Initiative (IAVI) is a global not-for-profit organization whose mission is to ensure the development of safe, effective, accessible, preventive HIV vaccines for use throughout the world. Founded in 1996 and operational in 24 countries, IAVI and its network of collaborators research and develop vaccine candidates. IAVI's financial and in-kind supporters include the Alfred P. Sloan Foundation, the Bill & Melinda Gates Foundation, the Foundation for the National Institutes of Health, The John D. Evans Foundation, The New York Community Trust, the James B. Pendleton Charitable Trust, The Rockefeller Foundation, The Starr Foundation, The William and Flora Hewlett Foundation; the Governments of Canada, Denmark, Ireland, The Netherlands, Norway, Sweden, the United Kingdom, and the United States, the Basque Autonomous Government as well as the European Union; multilateral organizations such as The World Bank; corporate donors including BD (Becton, Dickinson & Co.), Continental Airlines, Google Inc., Henry Schein, Inc., Merck & Co., Inc. and Pfizer Inc; leading AIDS charities such as Broadway Cares/Equity Fights AIDS and Until There's A Cure Foundation; other private donors such as The Haas Trusts; and many generous individuals from around the world. For more information, see www.iavi.org.

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