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Combination vaccine protects monkeys from ebola and Marburg viruses

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An experimental, combination vaccine against Ebola and Marburg viruses using virus-like particles (VLPs) provides complete protection against infection in monkeys. Researchers from the U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID) report their results today (Feb. 26) at the 2008 ASM Biodefense and Emerging Diseases Research Meeting in Baltimore, MD.

“VLPs are one of the most promising candidates for protecting humans against Ebola and Marburg virus infections,” says Dr. Kelly Warfield, a researcher at USAMRIID who presented the study. They could also be safer than other vaccine candidates.

Traditionally vaccines against viral diseases have consisted of whole viruses, either the one that causes the disease in a weakened or dead state (like the polio vaccine) or a genetically similar virus that does not usually cause disease but elicits a protective immune response. The problem with this approach is there is the risk, however small, of viral reactivation and infection.

“Since the VLP vaccine does not use a whole virus, there is no chance of infection,” says Warfield, who notes that some VLP-based vaccines, such as the human papillomavirus (HPV) vaccine, are already on the market.

To create the vaccine, Warfield and her colleagues infected insect cells with specially engineered baculoviruses. The infected cells then

produced VLPs for either Marburg or Ebola, depending on the baculovirus, which were then purified. They mixed the two together and vaccinated the monkeys with it.

“Following challenge with Ebola or Marburg virus, all the VLP-vaccinated monkeys survived challenge without clinical or laboratory signs of infection, while the control animals succumbed to the infection,” says Warfield. “Based on their safety profile, immunogenicity and protective efficacy, the VLPs are a leading candidate for use as a filovirus vaccine in humans.”

Additionally, Warfield discovered that vaccination with one strain of Marburg VLP produced protection against 3 different strains of the virus, which is surprising. Subunit vaccines (in which only part of the virus is used) had previously not been thought to confer broad-based immunity.

Researchers are currently working on scaling up the production process and hope to begin clinical trials in humans in a few years.

Source: American Society for Microbiology