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Follow-up Studies to the RV144 HIV Vaccine Trial Provide Possible Explanation for How the Vaccine May Have Protected Against HIV

April 5, 2012 (SILVER SPRING, Md.)—Researchers have discovered important clues about the immune responses that may have played a role in protecting some volunteers from HIV in the RV144 Thai trial. Results from extensive RV144 laboratory studies were published today in the New England Journal of Medicine.

The RV144 study in Thailand was the first HIV vaccine trial to show some effectiveness in preventing HIV infection. "These studies reinforce and extend the results seen in the RV144 trial and provide new insights that may lead to a better and longer-lasting HIV vaccine," noted Col. Jerome Kim of the U.S. Military HIV Research Program (MHRP) and senior author of the study.

Walter Reed Army Institute of Research and Duke University researchers collaborated with more than 25 institutions to analyze immune responses elicited in vaccine recipients. The researchers found that different types of antibody responses were associated with a higher or lower rate of HIV infection.

Barton Haynes, M.D., at Duke University led the studies. "This unprecedented collaboration brought together investigators from all over the world to compare immune function tests to understand the outcome of the RV144 trial. By studying those who became infected compared to those who did not, we believe we have found very important clues for how the RV144 vaccine regimen might have worked," said Haynes.

The first finding is that antibodies (IgG) specific to a particular region (called V1V2) of the HIV outer coat (envelope protein) correlated with lower infection rates among those who were vaccinated. The hypothesis is that when IgG antibodies bind to the V1V2 region, they might help prevent infection.

A second finding in the RV144 laboratory studies indicates that vaccine recipients with the highest blood levels of a different type of envelope binding antibody (IgA) appeared to have less protection from HIV than those with low levels. Scientists hypothesize that these IgA antibodies to a different region of HIV envelope may have interfered with possible vaccine-induced protective responses.

Results from RV144, a clinical trial involving more than 16,000 adult volunteers in Thailand, were published in the *New England Journal of Medicine* in 2009[1]. The results showed that the prime-boost combination of ALVAC® HIV and AIDSVAX® B/E was safe and lowered the rate of HIV infection by an estimated 31.2% compared with placebo (p=0.04). These data provided the first evidence in humans that a safe and effective preventive HIV vaccine is possible, and provided an opportunity to look for vaccine-induced immune responses that correlated with the rate of infection.

These laboratory studies inform new testable hypotheses that, if validated, may help scientists prioritize vaccine candidates for future clinical trials, potentially accelerating the development of a more efficacious vaccine. Col. Nelson Michael, MHRP Director and co-author of the study noted, "Different HIV vaccines may protect against HIV in different ways. More research is needed to fully understand these results, and to determine if they can be generalized to other types of HIV vaccines or similar vaccines tested against other regional types of HIV or via different routes of exposure."

The RV144 laboratory research was initiated and coordinated by the U.S. Military HIV Research Program at the Walter Reed Army Institute of Research, which receives funding from The U.S. Army Medical Research and Materiel Command and the Division of AIDS, NIAID, NIH. These studies were conducted by a large international collaboration led by the Center for HIV/AIDS Vaccine Immunology (CHAVI), which Dr. Haynes directs and is funded by the National Institute of Allergy and Infectious Diseases (NIAID)/National Institutes of Health (NIH), and by the Collaboration for AIDS Vaccine Discovery, which is funded by the Bill & Melinda Gates Foundation. The Statistical Center for HIV/AIDS Research and Prevention (SCHARP) at the Fred Hutchinson Cancer Research Center conducted the statistical design and analyses.

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Articles:

B. Haynes *et al.*, Immune Correlates Analysis of the ALVAC-AIDSVAX HIV-1 Vaccine Efficacy Trial. N Engl J Med 2012

[1] S. Rerks-Ngarm *et al.,* Vaccination with ALVAC and AIDSVAX to Prevent HIV-1 Infection in Thailand. N Engl J Med 2009; 361:2209-2220

For more information on RV144 and the correlates research including FAQs, visit www.hivresearch.org.

About MHRP:

The US Military HIV Research Program (MHRP) at the Walter Reed Army Institute of Research conducts research to develop an effective HIV vaccine and integrates prevention, treatment, diagnosis and monitoring as part of a global effort to protect troops and reduce the impact of HIV worldwide. MHRP has six clinical research sites in the U.S., Africa and Asia. The program successfully collaborates on HIV prevention care and treatment services, funded by the President's Emergency Plan for AIDS Relief (PEPFAR), with African militaries and in the communities where it conducts research. For more information, visit www.hivresearch.org.