

## FAQs

### Frequently asked questions regarding the RV144 Phase III HIV Vaccine Trial

#### 1. What is RV144?

The Phase III HIV Vaccine Trial, also known as RV144, was the largest HIV vaccine study ever conducted in humans and involved more than 16,000 volunteers in Thailand. The trial tested a “prime-boost” combination of two vaccines: ALVAC<sup>®</sup> HIV vaccine (the prime), and AIDSVAX<sup>®</sup>B/E vaccine (the boost). The vaccine combination was based on HIV strains that commonly circulate in Thailand.

#### 2. What was the goal of the trial?

The Phase III HIV Vaccine Trial was designed to test the vaccine regimen’s ability to prevent HIV infection, as well as its ability to reduce the amount of HIV in the blood of those who became infected after enrolling in the trial.

#### 3. What were the results of the trial?

Results of the trial show that the vaccine regimen is safe and 31.2 % effective at preventing HIV infection. While this is a modest level of efficacy, it represents a major step forward for HIV vaccines, providing the first evidence that development of a safe and effective preventive HIV vaccine is possible. Additional research is needed to better understand how the regimen reduced study volunteers’ risk of HIV infection.

#### 4. What vaccines were used in this study?

The vaccine regimen included two vaccine candidates, ALVAC<sup>®</sup> HIV (vCP1521) and AIDSVAX<sup>®</sup>B/E (gp120), and involved a total of six immunizations over six-months: four immunizations with ALVAC-HIV and two with AIDSVAX B/E given at the same time as the last two ALVAC-HIV injections. This combination of two different vaccines is called a prime-boost approach. In this approach, two vaccines are given in sequence with the goal of inducing the strongest and most comprehensive immune response possible.

The first vaccine used in the strategy, ALVAC-HIV (vCP1521), consists of a viral vector and genetically engineered versions of three HIV genes (*env*, *gag* and *pro*). A vector is a weakened or disabled virus used to deliver vaccine contents to the immune system once they are injected into the body. The ALVAC vector is a disabled form of a bird virus called canarypox, which cannot grow or cause disease in humans. The second vaccine used in the strategy is called AIDSVAX B/E, which is composed of genetically engineered gp120, a protein on the surface of HIV.

**5. Who manufactures the vaccines used in the study?**

ALVAC-HIV, the prime vaccine, is manufactured by sanofi pasteur. AIDSVAX B/E, the booster vaccine, was manufactured by Genentech under a license and supply agreement with VaxGen, one of the original manufacturing collaborators for the RV 144 trial. Global Solutions for Infectious Diseases (GSID), a not-for-profit organization co-founded by three former VaxGen executives who played a prominent role in the development and testing of the AIDSVAX B/E vaccines while at VaxGen, has assumed responsibility for the continued development and, if necessary, manufacturing of this product.

**6. Was the vaccine regimen safe?**

The two candidate vaccines were shown to be safe and well tolerated with the common adverse reactions typical of most vaccines. Before agreeing to participate, all volunteers were informed of and consented to the potential risks associated with receiving the experimental vaccine combination used in this study. Study volunteers also received counseling on how to prevent becoming infected with HIV at the beginning of the study and every six-months for three-years. There was no evidence that participants increased their HIV risk behavior during the study. The two study vaccine candidates do not contain all of the components of HIV and cannot combine to form an infectious virus, so the vaccines cannot cause HIV infection.

**7. Who conducted the trial?**

This trial was conducted by the Thai Ministry of Public Health in collaboration with a team of leading Thai and U.S. researchers. The trial was coordinated by the U.S. Military HIV Research Program (MHRP), which is based at the Division of Retrovirology, Walter Reed Army Institute of Research (U.S.) and the Department of Retrovirology at the Armed Forces Research Institute of Medical Sciences (Thailand). The official sponsor of this trial was the U.S. Army Surgeon General via the U.S. Army Medical Materiel Development Activity.

**8. Who is funding RV144?**

The U.S. Government, specifically the Division of AIDS, National Institute of Allergy and Infectious Diseases (NIAID), National Institutes of Health (NIH) and the U.S. Army Medical Research and Materiel Command, Department of Defense funded this clinical trial. The Thai Ministry of Public Health, GSID and sanofi pasteur, as well as each of the collaborators, provided extensive in-kind support.

**9. Where did the trial take place?**

The trial was conducted in the Rayong and Chon Buri Provinces in southeastern Thailand.

**10. How did the study enroll more than 16,000 people?**

This study was a tremendous operational success that recruited more than 60,000 interested participants, screened 26,675 people to see if they met the study's entry criteria and enrolled 16,402 qualified volunteers.

**11. What happened to volunteers who became infected with HIV during the trial?**

Volunteers who acquired HIV infection during the trial were given free access to HIV care and treatment, including highly active antiretroviral therapy (HAART), according to the guidelines of the Thai Ministry of Public Health. They were also offered extended follow-up in a separate study (RV152). The study vaccines did not cause HIV infection because they are not made from and do not contain the entire virus, either live or killed.

## **12. Why did the U.S. military conduct this study?**

For more than a century, the military medical community has solved many significant international health problems, particularly in the area of tropical infectious diseases, which have consistently posed a major threat to U.S. forces. With an estimated 33.2 million infections worldwide, HIV continues to pose a significant and persistent threat in terms of readiness and force protection, and may affect the stability and security of many nation-states.

With the emergence of an explosive HIV epidemic in Thailand in the early 1990s, U.S. Army researchers helped to characterize the heterosexual epidemic, isolated Thai viruses, and provided these sequences to companies making HIV vaccines. U.S. and Royal Thai Army researchers, the Thai Ministry of Public Health (MOPH) and other Thai vaccine experts together developed a plan to test this candidate vaccine in Thailand.

## **13. Why was the study conducted in Thailand?**

The Thai Ministry of Public Health has long been committed to preventing HIV through risk reduction and believes that an effective HIV vaccine is part of a comprehensive approach to HIV prevention. Thailand had a severe, generalized HIV epidemic, and was one of the first countries to have developed a National AIDS Plan and a National HIV Vaccine Development Plan. A major goal of the plan is “to promote and support national and international collaborative research that will lead to the development and evaluation of effective HIV/AIDS vaccines for potential use in Thailand.” The Thai government has shown a remarkable and successful commitment to HIV prevention, and it has a longstanding commitment to the development of an HIV vaccine as an additional HIV control measure.

## **14. What impact will this study have on the HIV vaccine field and what happens next?**

We now have evidence that a safe and effective HIV vaccine is possible, and the results should accelerate research efforts towards a more effective vaccine. The study partners are already consulting with scientific and product development experts to determine the need for additional research of the RV144 vaccine regimen to better understand how it protected humans against HIV infection.

In addition, we have already learned a great deal from this study, particularly in terms of conducting large-scale HIV prevention trials, and will continue to learn more as additional research is conducted.

For additional information regarding the trial, visit: [www.hivresearch.org](http://www.hivresearch.org)

### **Trial Collaborators**

U.S. Military HIV Research Program (MHRP)  
Ministry of Public Health, Thailand (MOPH)  
National Institutes of Allergy and Infectious Diseases (NIAID)  
sanofi pasteur  
Global Solutions for Infectious Diseases (GSID)

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