HIV Research Success

The U.S. Military HIV Research Program (MHRP) is at the forefront of the battle against HIV to protect U.S. troops from infection and reduce the global impact of the disease.

Since its inception in 1986, MHRP has emerged as a world leader in HIV prevention and cure research, vaccine and adjuvant development, epidemiology and threat assessment..

Vaccine Clinical Studies

MHRP has fostered relationships with an international network of research partners and contributed to research infrastructure and capabilities at sites in Africa and Asia to conduct Phase 1-3 trials of novel HIV vaccine products and optimization strategies:

- RapidVax: In 2024, MHRP researchers and partners in Uganda launched a study to evaluate whether exposure to escalating doses of HIV antigen administered over several days increases antibody magnitude and function.
- Adjuvant studies:
  - MHRP and collaborators began a Phase 1 trial to evaluate varying doses of the Army-developed and patented ALFQ adjuvant with a candidate HIV vaccine to optimize adjuvant dosage.
  - Another study in Thailand tested the ALFQ adjuvant with new HIV protein vaccines to examined fractional dosing strategies.
  - MHRP also conducted a comparative adjuvant HIV vaccine trial in 2021-23 in Kenya that tested experimental vaccines combined with different adjuvants
- mRNA vaccines:
  - MHRP and partners completed a preclinical study of an mRNA HIV vaccine in Thailand at the Armed Forces Research Institute of Medical Sciences.
  - MHRP is collaborating with WRAIR's Pilot Bioproduction Facility to establish an mRNA manufacturing program to develop a novel mRNA vaccine for HIV prevention.

Army Liposome Formulation (ALF) MHRP scientists developed the Army Liposome Formulation (ALF) family of adjuvants. The ALFQ formulation was awarded a patent in 2019. ALFQ is being tested in several ongoing clinical trials with vaccines for HIV, COVID-19, malaria and *campylobacter*.

HIV Vaccine Design for Broad Neutralization

Findings from MHRP's acute HIV infection cohort studies are informing a novel vaccine design strategy. Researchers analyzed genetic sequences from the RV217 acute infection cohort, sampled in the earliest weeks of HIV infection, and found that half the individuals who developed broadly neutralizing antibodies had acquired multiple HIV founder variants, whereas those with a single founder virus developed antibodies with limited neutralization breadth.

A vaccine that mimics infection with multiple founder variants may provoke the immune system to develop broadly neutralizing antibodies to prevent HIV infection. MHRP has received funding from the National Institute of Allergy and Infectious Diseases to pursue this strategy for vaccine design. MHRP is also working with BRILLIANT Consortium partners in Uganda, Kenya and Tanzania, and with Chulalongkorn University researchers in Thailand, to develop this vaccine strategy.

A Legacy of HIV Vaccine Success MHRP led the RV144 HIV vaccine clinical trial in Thailand that, for the first and only time, demonstrated a modest ability to protect against HIV infection, showing that an HIV vaccine is possible.

Defense Health. Global Health.

Epidemiology and Threat Assessment

MHRP's Department of Epidemiology and Threat Assessment conducts research on the epidemiology of HIV and other infectious diseases that threaten the readiness of U.S. and allied military forces. These studies identify opportunities for intervention and test strategies to mitigate the risk of HIV and other sexually transmitted infections (STIs).

MHRP and partners have launched the Multinational Observational Cohort of HIV and other Infections (MOCHI) study at sites in Uganda, Kenya and the Philippines to characterize regional incidence of HIV and other sexually transmitted infections (STIs). In addition to estimating HIV and STI incidence and tracking the evolution of risk and healthcare-seeking behaviors, the study facilitates the sites' preparedness for future HIV and STI countermeasure clinical trials by building capacity, evaluating site recruitment and retention and maintaining relationships with impacted communities.

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WRAIR Walter Reed Army Institute of Research
MILITARY HIV RESEARCH PROGRAM

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Preventive and Therapeutic Antibodies

Investigators at MHRP are developing broadly neutralizing monoclonal antibodies (bNAbs) to meet unique demands of the U.S. Military as a potent countermeasure against infectious diseases. MHRP has a particular interest in the application of bNAbs as a prevention tool to limit infection risks in deployed military settings, including those requiring blood transfusions.

Some existing bNAbs are becoming less potent over time because the HIV virus is mutating and evading those antibodies. MHRP researchers are working to screen hundreds of samples from the program's ongoing cohort studies to identify and isolate the next generation of potent, bNAbs that have potential to prevent or treat new and evolving strains of HIV.

Bispecific antibodies have two distinct binding domains that can bind to two antigens or two epitopes simultaneously, and MHRP is pursuing them as a potential HIV countermeasure. MHRP researchers are collaborating with the Aaron Diamond AIDS Research Center at Columbia University on human trials of a bispecific antibody they developed, and are conducting preclinical studies to advance new bispecific antibodies with support from the Military Infectious Diseases Research Program.

Acute HIV and Cure Research

MHRP conducts HIV cohort studies around the globe including many that identify people at the earliest stages after acquiring HIV. These studies help accelerate early treatment, build infrastructure, develop relationships in communities, and inform our HIV research.

These cohorts also provide the foundation for MHRP's functional cure studies to evaluate strategies aimed at inducing long-term remission of HIV without the need for antiretroviral therapy. Small "cure" clinical studies are testing wide-ranging combination interventions including therapeutic HIV vaccines and broadly neutralizing antibodies.

MHRP and partners across four continents recently launched a new collaborative HIV cure research initiative called DELIVER, or Developing Leadership and Innovation in Viral Eradication Research, supported by the National Institute of Allergy and Infectious Diseases Division of AIDS. DELIVER focuses on developing laboratory and clinical site infrastructure to build capacity to conduct long-term HIV remission studies in countries most impacted by HIV.

President's Emergency Plan for AIDS Relief (PEPFAR)

MHRP has implemented PEPFAR-funded HIV prevention, care and treatment activities with both civilian and military populations since 2005 in Kenya, Nigeria, Tanzania and Uganda, and expanded into the Philippines in 2021. The integration of research and HIV prevention, care and treatment services has helped MHRP build strong and trusting relationships within the communities where research is conducted and provides an ethical framework to conduct HIV clinical studies.