PRECLINICAL

Marburg virus vaccine development program

Translating **science** into **global** health impact

IAVI is developing a vaccine candidate for protection against Marburg virus (MARV), a deadly pathogen and potential bioweapon that repeatedly causes severe outbreaks.

The candidate uses recombinant vesicular stomatitis virus (rVSV), the same technology behind Merck's Ebola Zaire vaccine, ERVEBO®, which is licensed in more than a dozen countries.

About MARV

- In the *Filoviridae* family of highly pathogenic viruses, which are considered potential agents of bioweapon.[1]
- No vaccine or antiviral treatment is available despite repeated and deadly outbreaks.
- Causes Marburg virus disease (MVD), an uncommon but often fatal viral hemorrhagic illness notable for its severity, rapid onset, and high case fatality ratio – up to 88% in past outbreaks.
- Outbreaks have primarily occurred in sub-Saharan Africa, with additional cases documented in the U.S. and Europe.
- Included in the World Health Organization (WHO) Pathogen Prioritization framework as a priority pathogen for which a vaccine is urgently needed.
- Zoonotic disease: transmission from wildlife to humans ("spillover") can result in onward transmission between humans. The Egyptian fruit bat is considered a natural host of MARV.
- Initial spillover results from exposure to bats that frequently inhabit mines or caves. Most transmission occurs among health workers, family members, and close contacts.

Results

- Non-human primates vaccinated with IAVI's intranasal MARV vaccine candidate were completely protected following an aerosolized MARV challenge.
- A single intramuscular immunization of MARV vaccine at the lowest dose (10E2 pfu) protected non-human primates against MARV challenge delivered intramuscularly.
- Phase 1 clinical trial planned to begin in the U.S. by early 2026.

MARV by the numbers

0
Approved vaccines or therapeutics

50%
Average case fatality rate[2]

19
Reported outbreaks to date[2]

14
Countries have experienced an outbreak or cases[3]

21%
Estimated secondary attack rate[4]

80%
Confirmed cases in Rwanda's 2024 outbreak that were health workers[5]

Impact

During Rwanda's 2024 outbreak – which ultimately resulted in 66 confirmed cases – IAVI's MARV vaccine candidate was prioritized for review by a World Health Organization Technical Advisory Group due to its promising preclinical data.

A selection of this data was presented at the American Society of Tropical Medicine & Hygiene's Annual Meeting in October 2024. Research performed by scientists with IAVI's Vaccine Design & Development Laboratory and partner institutions indicated that non-human primates vaccinated intranasally and intramuscularly saw complete protection against MARV challenge. Based on the strength of these and other findings, IAVI's MARV vaccine candidate is progressing to a Phase 1 clinical trial.

> **"It is essential that we efficiently accelerate our vaccine development efforts for known infectious disease threats now and apply our lessons learned from the past, such that we are truly better prepared when outbreaks continue to occur in the future."**

– Swati Gupta, vice president and head of emerging infectious diseases and epidemiology, IAVI

Partnerships

- IAVI's MARV R&D program is funded by the Biomedical Advanced Research and Development Authority (BARDA).
- We are pursuing fast, flexible manufacturing solutions. In 2024, IAVI and Institut Pasteur de Dakar (IPD) in Senegal established a collaboration to research, develop, manufacture, and commercialize a range of novel vaccine candidates for both endemic and emerging infectious disease (EID) threats – all manufactured using a common vaccine production platform.
- We collaborate closely with the Viral Hemorrhagic Fever Consortium, a group of experts in affected countries.
- The Public Health Agency of Canada (PHAC) provided IAVI with a nonexclusive license to the rVSV vaccine candidates. The vector was developed by scientists at PHAC's National Microbiology Laboratory.
- Research partners include La Jolla Institute for Immunology, University of Texas Medical Branch at Galveston, Seattle Children's Research Institute, Texas Biomedical Research Institute, and more.

Visit IAVI's emerging infectious diseases page for more information.

[1] https://pmc.ncbi.nlm.nih.gov/articles/PMC3394174/
[2] https://www.who.int/news-room/fact-sheets/detail/marburg-virus-disease
[3] https://www.cdc.gov/marburg/outbreaks/index.html
[4] https://wwwnc.cdc.gov/eid/article/12/3/05-0622_article
[5] https://www.who.int/emergencies/disease-outbreak-news/item/2024-DON548

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