

Single dose Ebola vaccine is safe and effective in monkeys against outbreak strain

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First author Andrea Marzi, Ph.D., of NIAID's Laboratory of Virology, is shown in August 2014 analyzing Ebola test results from the ELWA3 hospital compound in Monrovia, Liberia. Credit: NIAID

National Institutes of Health (NIH) scientists report that a single dose of an experimental Ebola virus (EBOV) vaccine completely protects cynomolgus macaques against the current EBOV outbreak strain, EBOV-Makona, when given at least seven days before exposure, and partially protects them if given three days prior.

The live-attenuated [vaccine](#), VSV-EBOV, uses genetically engineered [vesicular stomatitis virus](#) (VSV) to carry an EBOV gene that has safely induced protective immunity in macaques. The experimental vaccine is currently undergoing testing in a global clinical trial in humans. VSV, an animal virus that primarily affects cattle, has been successfully tested as an experimental vaccine platform against several viruses.

Prior to this study, scientists had no information about how monkeys vaccinated with VSV-EBOV would respond to a challenge with EBOV-Makona, which has spread throughout West Africa. Previous animal studies demonstrated that VSV-EBOV could successfully protect monkeys against the first EBOV strain recognized, Mayinga, in 1976, and against EBOV-Kikwit, a strain that emerged in Central Africa in 1995. This new study shows that certain immune responses induced by VSV-EBOV are similar against all three viruses. The scientists, from NIH's National Institute of Allergy and Infectious Diseases Division of Intramural Research, concluded from these findings that VSV-EBOV likely would be equally protective against different EBOV strains.

The group also observed that the experimental VSV-EBOV vaccine appears to provide initial protection by triggering innate virus-fighting host responses; these responses partially protected animals challenged with EBOV-Makona within a week after vaccination. Animals vaccinated more than a week before viral challenge developed antibodies, an [adaptive immune response](#), that were shown to be critical for protection.

More information: A Marzi et al. VSV-EBOV rapidly protects macaques against infection with the 2014/15 Ebola virus outbreak strain. *Science* DOI: [10.1126/science.aab3920](https://doi.org/10.1126/science.aab3920) (2015).

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