First-ever experimental Sudan virus specific antibody treatment protects animals

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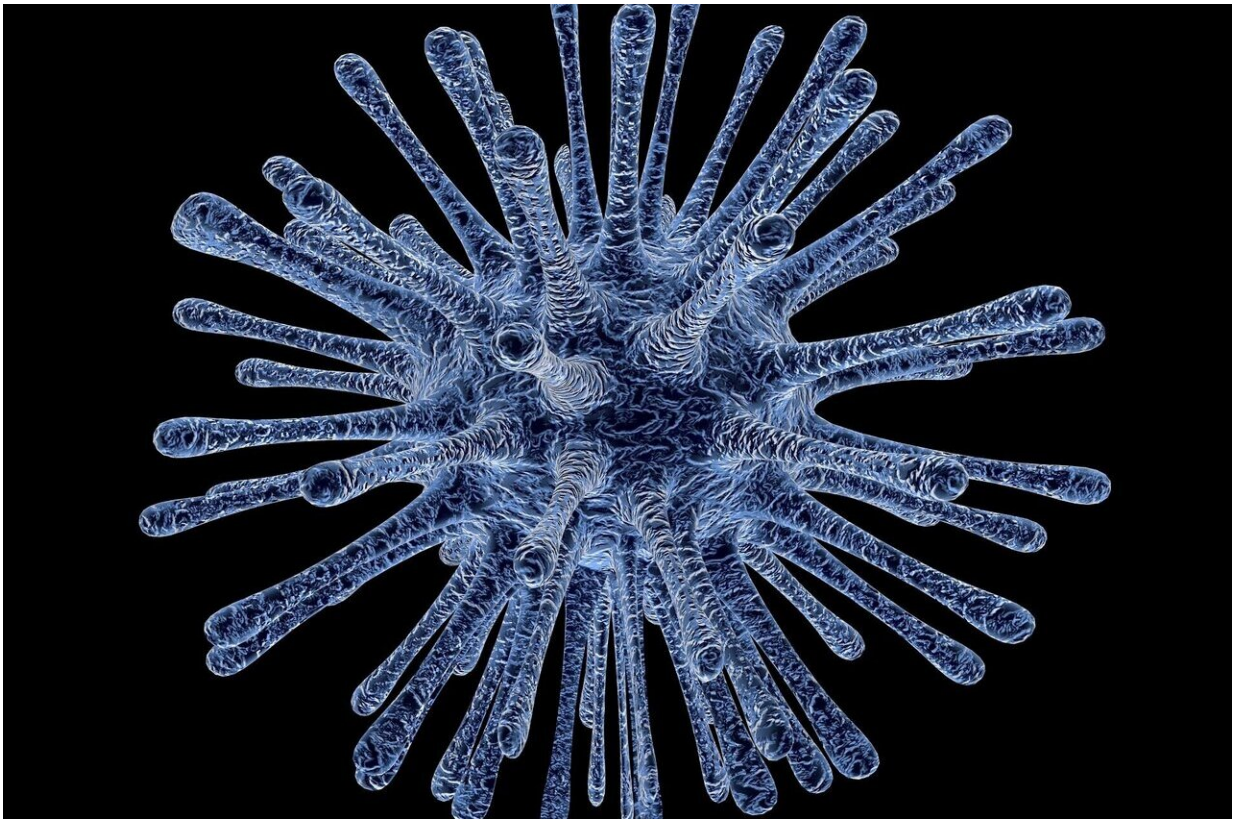

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Army scientists working with partners from industry and academia have developed an experimental treatment that protects animals from Sudan virus, which is closely related to Ebola. Their work is published online

today in the journal *Proceedings of the National Academy of Sciences*.

There are six distinct species of ebolaviruses, which collectively pose a significant threat to the global community, particularly in areas of equatorial and West Africa. While Ebola virus was the causative agent of the 2013-2016 outbreak that developed into the largest epidemic in recorded history, Sudan virus also presents a significant health threat, according to the authors.

One promising approach to treating ebolavirus infection involves the development of immunotherapies—drugs that boost the body's own immune system to fight infection. Scientists can design proteins, called antibodies, and combine them into "cocktails" to treat a particular type of infectious disease. Until now, however, there has been no such cocktail specific for Sudan virus.

Led by John M. Dye, Ph.D. of the U.S. Army Medical Research Institute of Infectious Diseases, the team produced a panel of monoclonal antibodies that are specifically designed to attach to the Sudan virus glycoprotein and block the virus from entering cells. They tested them in cell culture, and further evaluated the most promising candidates in a mouse model of Sudan virus infection.

Based on the results of the rodent testing, the team then selected a mixture of two Sudan-specific monoclonal antibodies for assessment in rhesus macaques. This mixture, called RIID F6-H2, provided protection from Sudan virus in rhesus macaques when administered on days 4 and 6 post-infection.

"We are excited to offer a potential treatment option against one of the most deadly human pathogens known," said Dye. "Being prepared by having countermeasures against emerging infectious diseases allows the global community to try to stay one step ahead, rather than play 'catch-

up' against potential pandemic viruses."

According to COL E. Darrin Cox, commander of USAMRIID, the work highlights the impact of USAMRIID research on warfighter health and public health.

"In addition, the sheer number of collaborators is a testament to the importance of government, academic and commercial laboratories working together to advance medical countermeasure development," said Cox.

Co-investigators on the study included Albert Einstein College of Medicine, Mapp Biopharmaceutical, Inc., Fraunhofer, BioFactura, and The Geneva Foundation.

"Our team is extremely proud that this cocktail of antibodies is now being considered for advancement into phase 1 clinical studies," said Dr. Andrew Herbert of USAMRIID, the paper's first author. "We have the opportunity to make a real impact on global health."

More information: Andrew S. Herbert el al., "Development of an antibody cocktail for treatment of Sudan virus infection," *PNAS* (2020). www.pnas.org/cgi/doi/10.1073/pnas.1914985117

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