

Development of vaccines from AIDS to Zika, using a novel 'plug and play' viral platform

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Researchers from GeoVax have developed a flexible "Plug and Play" technology platform that delivers single-dose vaccines that fully protect against emerging infectious diseases such as Zika, Lassa fever, and Ebola. The research will be presented at ASM Microbe, the annual meeting of the American Society for Microbiology, held from June 7th to June 11th in Atlanta, Georgia.

"Unlike other vaccine technologies currently available, which sacrifice confidence in success for speed or vice-versa, the GeoVax technology offers a true "Plug and Play" [platform](#) approach that is well suited for use against a wide range of biological threats and amenable to rapid, large-scale production," said Rahul Basu, scientist at GeoVax and lead author on the study.

Vaccines produced in this platform are safe, highly immunogenic, and effective against a wide range of indications. The vaccines are suitable for repeated use, stable at refrigerator temperatures or lyophilized for non-cold chain needle-free application, and amenable to rapid and affordable scale-up for use in both epidemic response and routine vaccination.

"A significant unmet medical need exists for vaccine platform technologies to respond rapidly and effectively against biological threats," said Mr. Basu, "Preferably, such platforms should deliver vaccines that are safe and confer full protection after a single dose."

In proof-of-concept studies, the researchers tested three independent vaccines against three different families of viruses. Each vaccine demonstrated full protection after a single dose, using various lethal challenge models. For the Zika vaccine, a single inoculation of MVA-Zika vaccine in normal (immunocompetent) mice provided 100% protection against a lethal challenge dose of a neurovirulent ZIKV delivered directly into the brain. A single inoculation of MVA-VLP-Ebola vaccine candidate provided full protection in a rhesus monkey lethal challenge model. A single inoculation of MVA-VLP-LASV [vaccine](#) protected mice against a lethal challenge delivered directly into the brain.

"To demonstrate a broad utility of the platform, we developed prophylactic and therapeutic vaccines for other infectious diseases as well as cancer," said Mr. Basu. These included prophylactic and therapeutic vaccines for HIV (already in advanced clinical trials), preventive vaccines for Marburg, Sudan and Malaria, all with major epidemic potential with high human lethality, as well as therapeutic vaccines for chronic hepatitis B infections and tumor-associated antigen (TAA)-based-cancer vaccines.

These studies on single-dose vaccines for emerging [infectious diseases](#) were supported with funding from the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health (NIH) and performed at laboratories of the Centers for Disease Control, (CDC) in Fort Collins, CO, Institute of Human Virology, University of MD and NIH's Rocky Mountain Laboratories have demonstrated the broad utility of the platform. These are described in a Late-breaking presentation at the ASM Microbe 2018 meeting in Atlanta.

Provided by American Society for Microbiology

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