DNA-based Zika vaccine is safe and effective at inducing immune response

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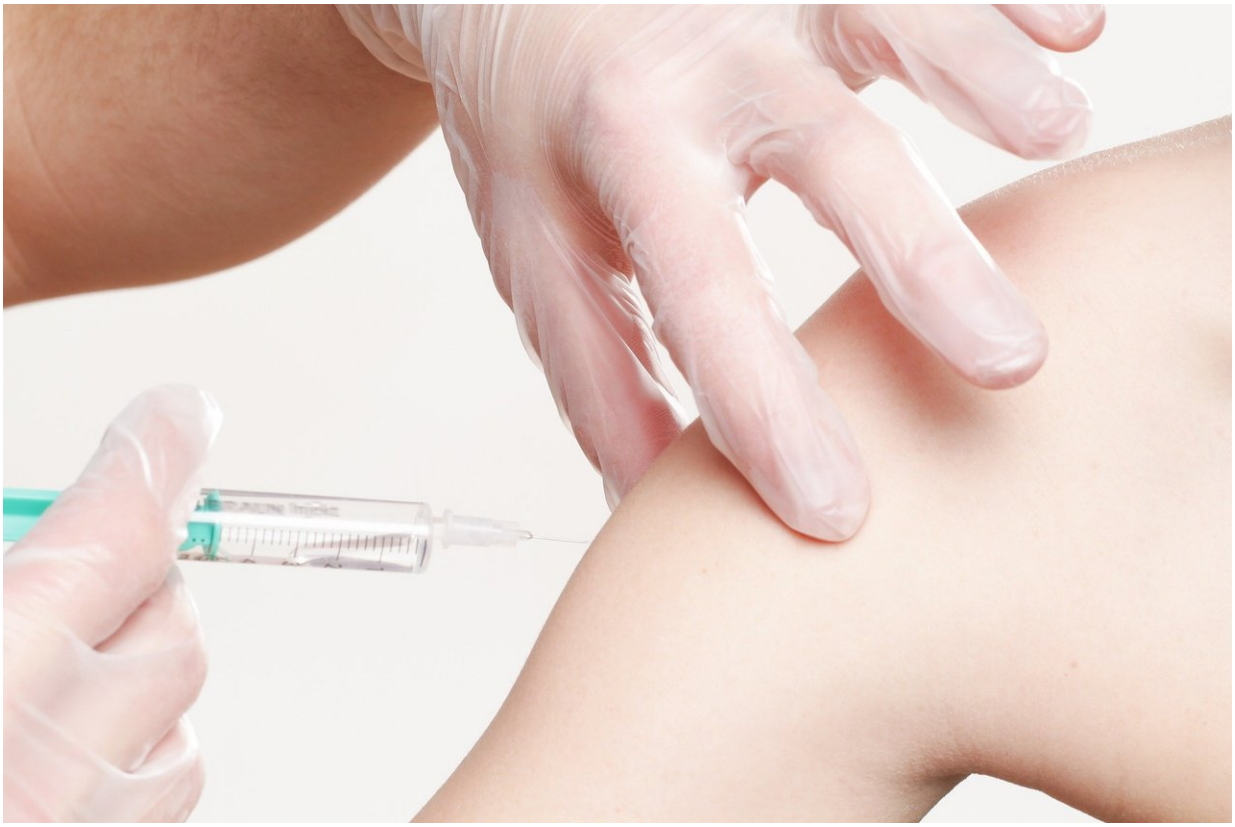

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A new generation DNA-based Zika vaccine demonstrated both safety and ability to elicit an immune response against Zika in humans in a phase 1 clinical trial conducted through a partnership among the

Perelman School of Medicine at the University of Pennsylvania, Inovio Pharmaceuticals, GeneOne Life Science, and The Wistar Institute. The research was published in the *New England Journal of Medicine*.

Zika virus is a mosquito-borne infection associated with birth defects and neurological complications in adults. In 2015 and 2016, Zika virus spread rapidly through Brazil, the Caribbean, and the southern United States. However, no approved vaccine or treatment is currently available. This is the first study to show that a DNA vaccine can produce an immune response against the virus with minimal adverse effects, opening the door to further trials to move this vaccine forward.

"Synthetic DNA vaccines are an ideal approach for emerging infectious diseases like Zika," said David B. Weiner, Ph.D., executive vice president of The Wistar Institute, director of Wistar's Vaccine & Immunotherapy Center, developer of the Zika vaccine and collaborating author on the study. "This new generation of DNA vaccines can be designed and manufactured rapidly, they appear to be highly predictable for the generation of immunity in humans, have significant conceptual safety advantages, and they are more stable than most traditional vaccines, making them exceptionally practical to distribute during outbreaks, especially in regions where resources are limited and we need to be able to respond quickly to curb an emerging epidemic."

The GLS-5700 vaccine contains the synthetic DNA instructions for the host to learn how to mount an immune response against a specific Zika virus antigen. Researchers enrolled 40 participants in the safety trial between August and September of 2016. Two groups of 20 participants received two different doses of the vaccine candidate intradermally at zero, four, and 12 weeks. Each dosage was followed by Cellectra delivery at the site, which generates small, directional electric currents into the skin to facilitate optimal vaccine uptake, production of the intended antigen, and immune responses.

Results showed that two weeks after the final dose 100 percent of study participants developed Zika-specific antibodies and 80 percent developed significant neutralizing antibodies against the virus. Importantly, serum from the study participants was able to protect immunocompromised mice from developing the disease after infection with Zika virus, indicating that the vaccine-induced antibodies can prevent infection in vivo. The vaccine was also well tolerated.

"Zika virus continues to be a threat to people living in the Americas and the Caribbean," said Pablo Tebas, M.D., professor of Infectious Diseases at the University of Pennsylvania and lead author on the study. "With these new results, we are one step closer to hopefully finding a way to prevent infection, which can cause serious birth defects and developmental delays in babies born to women who are infected with Zika."

Provided by The Wistar Institute