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Chikungunya antibody set to enter clinical trial

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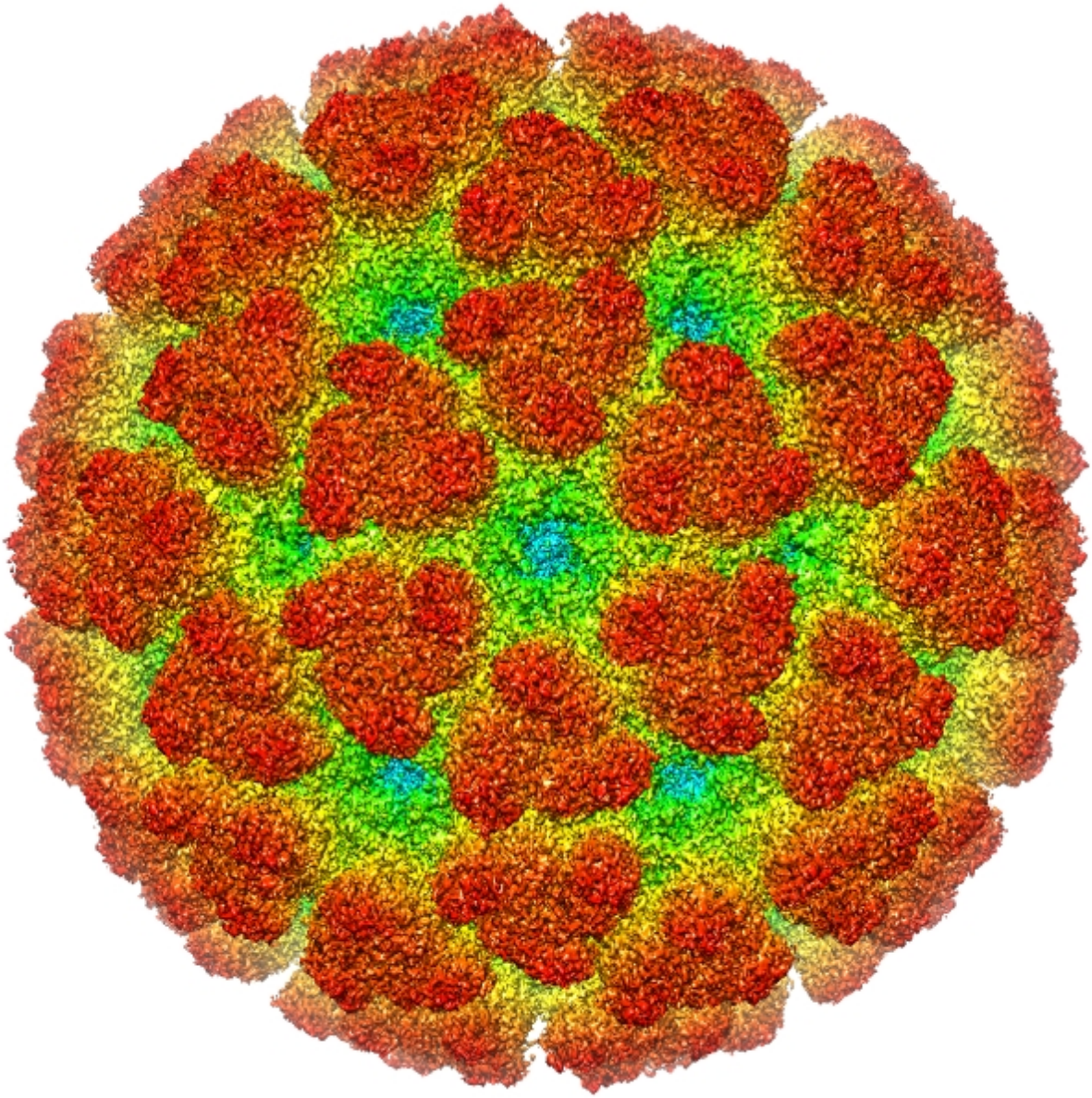

Cryoelectron microscopy reconstruction of Chikungunya virus. From EMDB entry 5577. Credit: Wikipedia

A monoclonal antibody against the chikungunya virus developed by researchers at Vanderbilt University Medical Center is the first monoclonal antibody encoded by messenger RNA to enter a clinical trial.

Moderna Inc., a biotechnology firm based in Cambridge, Massachusetts, that is focused on developing mRNA-based vaccines and therapeutics, announced the clinical trial earlier this month.

The specific antibody against the mosquito-borne chikungunya virus, which causes fever, rash, and sometimes debilitating joint pain, initially was identified in the blood of a previously infected person who developed potent immunity against the virus.

Researchers in the laboratory of James Crowe Jr., MD, who directs the Vanderbilt Vaccine Center, isolated the messenger or mRNA that encodes the antibody protein.

The Moderna team developed the mRNA sequence for the antibody and encapsulated it in their proprietary lipid nanoparticle (LNP) technology, which has been delivered in a Phase I safety trial in human subjects. The goal is for cells that take up the encapsulated RNA to then produce the anti-chikungunya antibody.

"This is a first test in man of any mRNA-delivered antibody for an infection," said Crowe, the Ann Scott Carell Professor in the Departments of Pediatrics and of Pathology, Microbiology and Immunology at Vanderbilt University School of Medicine.

"Our mission is to create a fundamentally new class of medicines with mRNA therapeutics that can help patients with a wide range of conditions," Moderna President Stephen Hoge, MD, wrote in a blog post on his company's website. "This announcement is an important part of that path forward."

The program is supported by a grant from the Defense Advanced Research Projects Agency (DARPA) of the U.S. Department of Defense to develop new methods for preventing the global spread of viruses like chikungunya and Zika.

Currently there is no effective treatment for chikungunya virus infection and no licensed vaccine to prevent it. Enabling the body to produce antibodies against chikungunya through RNA infusions is a natural and powerful way to combat the virus, Crowe said, "because human beings make the most amazing antibodies."

Provided by Vanderbilt University

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