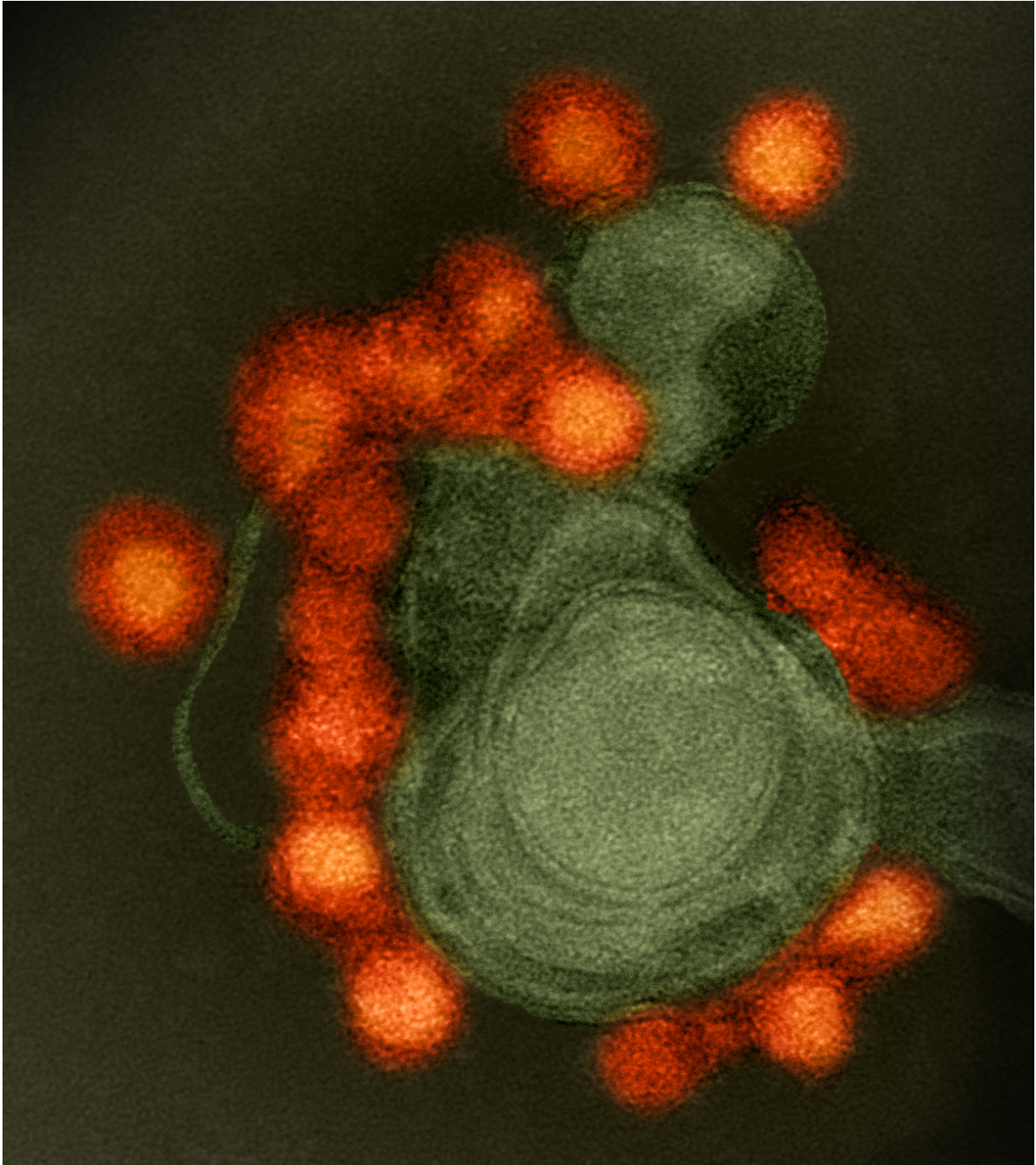


Researchers create powerful new tools to combat Zika

November 18 2016



Transmission electron microscope image of negative-stained, Fortaleza-strain Zika virus (red), isolated from a microcephaly case in Brazil. The virus is associated with cellular membranes in the center. Credit: NIAID

New research from The University of Texas Medical Branch in Galveston, in collaboration with Southwest University in Chongqing, China and the University of Leuven in Belgium, have developed a way to replicate the basic structure of the Zika virus, stripping it of the genes that make the virus infectious. The replicon system research was spearheaded by Dr. Xuping Xie and recently published in *EBioMedicine*.

Replicons are segments of [viral genome](#) that can replicate on their own, independent of the cellular chromosome. The new Zika replicon system has deleted some of the genes that give the virus its structure. Because of this, the altered Zika virus is no longer infectious, lowering the safety risk involved in working with it.

"One of these replicons can be used to locate portions of the viral molecule that block or halt [viral replication](#), making it a powerful tool for vaccine development," said senior author Pei-Yong Shi, a professor in the department of biochemistry and molecular biology.

The replicon system was engineered by attaching genes that allow researchers to tag certain parts of the virus that they are interested in. Luciferase, the chemical that gives fireflies their signature glow, was used to make targeted viral components light up - making processes like replication much easier to observe.

"The other newly-developed replicon was designed to study potential antiviral agents by differentiating between when the virus is making copies of itself and when it's altering its structure," Shi said. "Knowing when and how the virus is mutating is important, as evolution is what makes viruses more adept at invading hosts like humans or animals or become more damaging once inside the host."

The recent Zika virus outbreak has highlighted the urgent need to establish genetic tools for studying how the virus multiplies and causes

disease within a newly infected person in order to develop countermeasures. This is especially important because the Zika [virus](#) is spreading rapidly and behaves differently than many other viruses - for instance, it can be transmitted sexually and is associated with microcephaly and Guillain-Barre syndrome.

Provided by University of Texas Medical Branch at Galveston

Citation: Researchers create powerful new tools to combat Zika (2016, November 18) retrieved 25 April 2024 from <https://medicalxpress.com/news/2016-11-powerful-tools-combat-zika.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.