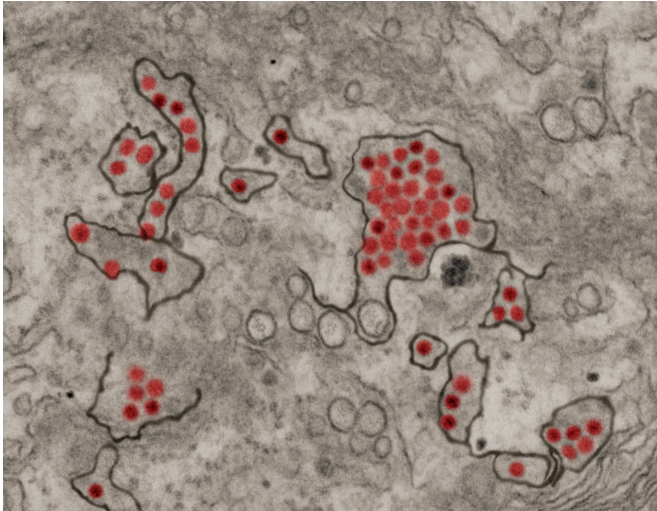


# Monoclonal antibody 'cocktail' halts Zika infection

4 October 2017



Zika virus particles (red) shown in African green monkey kidney cells. Credit: NIAID

A collaborative study led by a University of Miami Miller School of Medicine researcher has found that a "cocktail" of monoclonal antibodies prevented Zika virus (ZIKV) infection in primates. "This is a promising intervention to prevent and treat ZIKV infection during pregnancy," said David Watkins, Ph.D., professor and vice chair for research, Department of Pathology. "We would like to develop this antibody combination and get it into clinical trials as soon as possible."

Watkins and Dennis Burton, Ph.D., chairman and professor of the Department of Immunology & Microbiology at the Scripps Research Institute, led the collaborative international study, "Neutralizing Human Monoclonal Antibodies Prevents Zika Virus Infection in Macaques," published recently in *Science Translational Medicine*. Miller School co-authors included Diogo M. Magnani, Ph.D., associate scientist and co-first author of the study; Ronald C. Desrosiers, Ph.D., professor of pathology and director of research faculty

development; Michael J. Ricciardi, Varian K. Bailey, Lucas Gonzalez-Nieto, Martin J. Gutman, Nria Pedreo-Lopez, Helen S. Maxwell, Aline Domingues, and Mauricio A. Martins, Ph.D., all in the Department of Pathology.

"ZIKV infection is a serious, ongoing public health threat to South Florida, the Caribbean, Latin America and other regions around the world," Watkins said. "If a Zika outbreak occurs in a metropolitan area like Miami, the only way to prevent infection is to avoid the *Aedes aegypti* mosquitoes that carry the [virus](#)."

Therapies to prevent maternal Zika virus infection and its subsequent fetal developmental complications are urgently required."

Working closely with Burton and Tom Rogers, M.D., Ph.D., from the Scripps Research Institute in La Jolla, California, Watkins' laboratory team used a cocktail of three monoclonal antibodies to treat four monkeys. These three potent ZIKV-neutralizing [monoclonal antibodies](#) - called SMZAb1, SMZAb2, and SMZAb5 - were isolated by the Burton group from a South American patient.

**ZIKA** virus is a **MOSQUITO-BORNE** pathogen that can cause symptoms of:

- Fever
- Eye Inflammation
- Joint Pain
- Rash

*In some cases, Zika virus infections have been associated with Guillain-Barre syndrome, an autoimmune condition leading to muscle weakness and paralysis.*

"Neutralizing human monoclonal antibodies prevent Zika virus infection in macaques," *Science Translational Medicine* (2017).  
[stm.sciencemag.org/lookup/doi/10.1126/scitranslmed.aan8184](http://stm.sciencemag.org/lookup/doi/10.1126/scitranslmed.aan8184)

Provided by University of Miami Leonard M. Miller School of Medicine

Infection during pregnancy has been linked to birth defects in infants including **microcephaly** (or smaller than normal head size) and eye abnormalities.

Cases of Zika virus infection have been reported in **49** states in North America, mostly associated with travel to endemic areas.

**IN US**

Infographic explaining the global prevalence of Zika virus. Credit: Carla Schaffer / AAAS

"We administered a cocktail of these three antibodies to nonhuman primates one day before challenging them with Zika virus that had been isolated from a pregnant woman during the 2016 epidemic in Rio de Janeiro," he said. "To our surprise, this prophylactic treatment completely prevented the virus from taking hold in the animals."

In four control animals, the virus caused a fulminant [infection](#) that lasted for seven days, Watkins added. But there were no measurable virus levels in the blood of the four animals treated with the monoclonal combination, nor was there any immune system response, indicating the virus had been blocked completely.

"Since these [antibodies](#) have exceptional safety profiles in humans and cross the placenta, this combination could be rapidly developed to protect uninfected pregnant women and their fetuses," he said.

**More information:** D.M. Magnani et al.,

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