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Antibodies from dengue virus survivors can be used to prevent Zika infection

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A new research study from University of North Carolina researchers shows that individuals who have been previously infected with a flavivirus – specifically dengue and Zika viruses – could have antibodies that protect against Zika.

Those antibodies could be used to develop vaccines to protect against Zika, as well as therapies to treat the virus, according to the study, which was a collaboration between researchers at UNC's Gillings School of Global Public Health and the UNC School of Medicine.

The study, "Dengue Virus Envelope Dimer Epitope Monoclonal Antibodies Isolated from Dengue Patients Are Protective against Zika Virus," was published in the July/August issue of mBio, the journal of the American Society for Microbiology.

Ralph Baric, PhD, professor of epidemiology at Gillings, served as the study's principal investigator. UNC School of Medicine's Aravinda de Silva, PhD, who is currently working on NIH-funded Zika vaccine development and other Zika research, is a co-author.

The World Health Organization (WHO) reports that 65 countries and territories have reported cases of Zika virus. Many people don't realize they are infected; 85 percent of people believed to have Zika are asymptomatic. Common symptoms of flaviviruses include fever, rash, joint paint, muscle aches, and headaches. Zika is transmitted through Aedes mosquito species. Instances of sexual transmissions and maternal-

fetal transmission of the virus have been reported, including in the United States.

"In essence, a therapeutic treatment using antibodies derived from selected dengue and Zika virus survivors would protect pregnant women and others from contracting the Zika virus if they came in contact with it," Baric said.

Pregnant women are especially vulnerable to Zika infection because of potential birth defects. The main birth defect attributed to Zika is microcephaly, a rare neurological condition in which an infant is born with a much smaller head – an effect of abnormal brain development.

The antibody treatment would not create a lifelong immunity, but would be an effective short-term tool to prevent infections from the current strains of the Zika virus during an outbreak.

According to WHO, an estimated 390 million people are infected with dengue worldwide each year. Currently, there are three phase-three clinical trials for a dengue vaccine and UNC is collaborating with vaccine developers to understand data from these trials, de Silva said.

More information: J. A. Swanstrom et al. Dengue Virus Envelope Dimer Epitope Monoclonal Antibodies Isolated from Dengue Patients Are Protective against Zika Virus, *mBio* (2016). DOI: 10.1128/mBio.01123-16

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