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## **Zika can infect adult brain cells, not just fetal cells, study suggests**

By Brady Dennis August 18 at 12:00 PM

The more researchers learn about the Zika virus, the worse it seems.

A growing body of research has established that the virus can cause severe birth defects — most notably microcephaly, a condition characterized by an abnormally small head and often incomplete brain development. The virus also has been linked to cases of Guillain-Barre syndrome in adults, a rare autoimmune disorder that can result in paralysis and even death.

Now, in a study in mice, researchers have found evidence that suggests adult brain cells critical to learning and memory also might be susceptible to the Zika virus.

"This was kind of a surprise," Joseph Gleeson, a professor at Rockefeller University and one of the co-authors of the study published Thursday in the journal *Cell Stem Cell*, said in an interview. "We think of Zika health concerns being limited mostly to pregnant women."

*[For Zika-infected pregnancies, microcephaly risk may be as high as 13 percent]*

In a developing fetus, the brain is made primarily of "neural progenitor" cells, a type of stem cell. Researchers believe these cells are especially susceptible to infection by the Zika virus, which can hinder their development and disrupt brain growth. Most adult neurons are believed to be resistant to Zika, which could explain why adults seem less at risk from the virus's most devastating effects.

But some neural progenitor cells remain in adults, where they replenish the brain's neurons over the course of a lifetime. These pockets of stem cells are vital for learning and memory. Gleeson and his colleagues suspected that if Zika can infect fetal neural progenitor cells, the virus might have the same ability to infect adult neural progenitor cells. That's precisely what they found.

"We asked whether [these cells] were vulnerable to Zika in the same way the fetal brain is," Gleeson said. "The answer is definitely yes."

Gleeson is the first to admit that the findings represent only an initial step in discovering whether Zika can endanger adult human brain cells. For starters, the study was conducted only in mice, and only at a single point in time.

More research will be necessary to see whether the results of the mouse model translates to humans, and whether the damage to adult brain cells can cause long-term neurological damage or affect behavior.

But the initial findings suggest that the Zika virus, which has spread to the United States and more than 60 other countries over the past year, may not be as innocuous as it seems for adults, most of whom never realize they have been infected. Researchers found that infected mice had more cell death in their brains and reduced generation of new neurons, which is key to learning and memory. The possible consequences of damaged neural progenitor cells in humans would include cognitive problems and a higher likelihood for conditions such as depression and Alzheimer's disease.

*[Obama administration to shift \$81 million to fight Zika]*

"Zika can clearly enter the brain of adults and can wreak havoc," Sujan Shrestha, another study co-author and a professor at the La Jolla Institute of Allergy and Immunology, said in a statement. "But it's a complex disease — it's catastrophic for early brain development, yet the majority of adults who are infected with Zika rarely show detectable symptoms. Its effect on the adult brain may be more subtle, and now we know what to look for."

William Schaffner, an infectious disease expert at Vanderbilt University Medical Center, agreed Thursday that the findings are preliminary. But he also called it troubling.

"Here's the deal — the more we've learned about the Zika virus, the nastier it is," said Schaffner, who was not involved in the study. He said scientists have had concerns all along about Zika's ability to damage the brain, but until now the worries have focused mostly on the developing brain. "This mouse study will increase our anxiety. ... It's an additional potential way that this virus can cause human illness."

That's a possibility that demands further examination, he said, given the hundreds of thousands of people already infected by Zika — a number that continues to grow daily.

"Our attention, quite understandably, has been devoted to pregnant women and newborns, and preventing those infections," Schaffner said. "This mouse study will tell investigators that, in addition to pregnant women, you have to establish some studies in older children and adults as well."

Gleeson agreed. "We don't want to have this be a panic. Zika, for the most part, is a benign condition in healthy humans," he said. "But we also need to look at the potential consequences in a careful way."