## Research uncovers possible mechanism for Zika's damaging effects on brain

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The U.S. Centers for Disease Control and Prevention recently concluded that Zika virus infection in pregnant women can stunt neonatal brain development, leading to babies born with abnormally small heads, a condition known as microcephaly. Now, for the first time, researchers at University of California San Diego School of Medicine have determined one way Zika infection can damage developing brain cells. The study, published in *Cell Stem Cell*, also shows that inhibiting this mechanism reduces brain cell damage, hinting at a new therapeutic approach to mitigating the effects of prenatal Zika virus infection.

Using a 3D, stem cell-based model of a first-trimester human brain, the team discovered that Zika activates TLR3, a molecule human cells normally use to defend against invading viruses. In turn, hyper-activated TLR3 turns off genes that stem cells need to specialize into brain cells and turns on genes that trigger cell suicide. When the researchers inhibited TLR3, brain cell damage was reduced in this organoid model.

"We all have an innate immune system that evolved specifically to fight off viruses, but here the virus turns that very same defense mechanism against us," said senior author Tariq Rana, PhD, professor of pediatrics at UC San Diego School of Medicine. "By activating TLR3, the Zika virus blocks genes that tell stem cells to develop into the various parts of the brain. The good news is that we have TLR3 inhibitors that can stop this from happening."

Read full, original post: Zika virus may cause microcephaly by hijacking human immune molecule