Researchers discover how the placenta may be blocking SARS-CoV-2 transmission to babies during pregnancy

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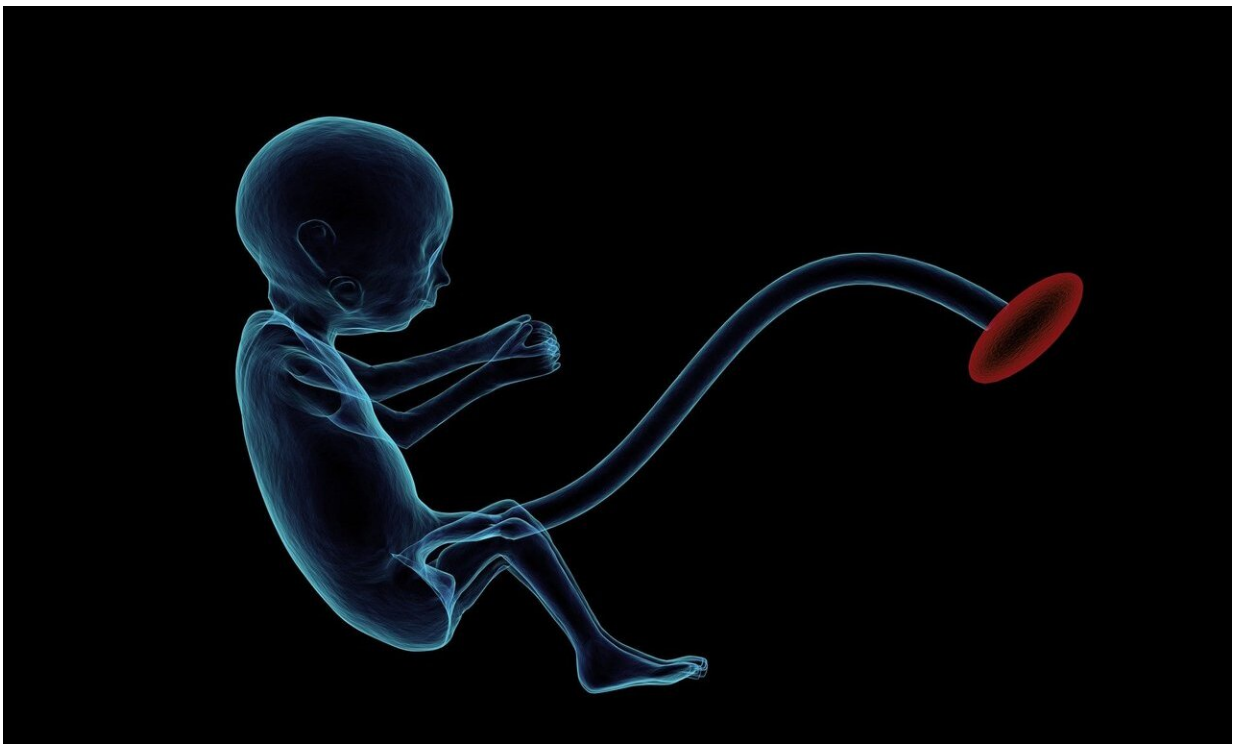

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While COVID-19 disease significantly impacts many pregnant women, the rates of transmission from mother to baby in pregnancy are very low. A new study from Boston University School of Medicine (BUSM) has

demonstrated that ACE-2, the receptor that allows SARS-CoV-2 to enter cells, is found in lower levels in the placentas of women with COVID-19 in pregnancy compared to women with normal (COVID negative) pregnancies.

"We think that when a woman has COVID-19 in pregnancy, the placenta is shedding off ACE-2 as a way to block SARS-CoV-2 from being passed to the fetus," explained co-corresponding author Elizabeth S. Taglauer, MD, Ph.D., assistant professor of pediatrics at BUSM.

The study is a collaborative effort between placental/perinatal researchers at BUSM, Boston Medical Center (BMC), Ke Yuan, Ph.D. a lung vascular biologist at Boston Children's Hospital and Hongpeng Jia, Ph.D., an ACE-2 expert at Johns Hopkins University. It involved collecting placentas from two groups of women who delivered at BMC from July 2020-April 2021, an effort led by study co-author Elisha Wachman, MD, an associate professor of pediatrics at BUSM and a neonatologist at BMC. The first group was women who had normal pregnancies and no report of SARS-CoV-2 infection. The second group of women were SARS-CoV-2 positive and had active COVID-19 disease during pregnancy. They then observed the ACE-2 expression in their placentas under the microscope and compared placental ACE-2 expression using genetic and protein analysis techniques.

According to the researchers, the placenta has many similarities with the lung, so this study also highlights the importance of studying the placenta to help understand a variety of lung diseases and highlights the important role of controlling ACE-2 as a way to prevent SARS-CoV-2 infections.

"The placenta is one of the few "success stories" of the pandemic. If we understand how the placenta is naturally protecting babies from COVID-19, this may provide important information for therapies and strategies to help prevent other SARS-CoV-2 infections from continuing

to spread," adds Taglauer, a neonatologist at BMC.

These findings appear online in the *American Journal of Pathology*.

More information: Elizabeth S. Taglauer et al, Acute SARS-CoV-2 infection in pregnancy is associated with placental ACE2 shedding., *The American Journal of Pathology* (2022). DOI: 10.1016/j.ajpath.2021.12.011

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