

Researchers identify proteins that prevent COVID-19 transmission through the placenta

September 2 2020



Credit: CC0 Public Domain

Researchers from Boston Medical Center's Maxwell Finland Laboratory for Infectious Diseases have identified properties in placenta tissue that may play an important role in preventing the transmission of COVID-19

from a mother with the virus to her fetus. The study results demonstrate that the COVID-19 virus universally invades the placenta in cases with and without evidence of fetal infection, highlighting the protection that the placenta may offer against COVID-19 infection as current data indicates a less than five percent COVID-19 transmission rate in newborns from their mothers. Published in *Placenta*, these results underscore the importance of using placenta tissue in COVID-19 research studies aimed at developing novel ways to diagnose, treat and prevent COVID-19 virus transmission.

For this study, the researchers examined placental [tissue](#), which shares many developmental and physiological similarities with the lung and the [immune response](#) of the small and [large intestine](#), making it a key source of human tissue that can be used for ongoing COVID-19 research. It also contains a unique expression pattern of COVID-19 receptors that are different from other organs, which could be helpful in the development of COVID-19 treatments.

"The results of this study provide evidence for ongoing research of COVID-19 [infection](#) at the maternal-fetal interface as means to better understand virus transmission and infection in other [human tissues](#)," said Elisha Wachman, MD, a neonatologist at Boston Medical Center, associate professor of pediatrics at Boston University School of Medicine, and principal investigator of this study. "Previous research has shown that the [placenta](#) protects the fetus from various types of infection, and exploring the particular ways in which it protects the fetus from COVID-19 transmission may help identify new targets of COVID-19 prevention and treatment."

Throughout April and May 2020, samples from 15 COVID-19 positive maternal-fetal dyads were collected for this study; five cases had evidence of fetal transmission. The placental tissue of the positive cases was analyzed and compared with ten COVID-19 negative controls. The

researchers found that the COVID-19 virus was present in the placental tissues in cases with and without evidence of fetal infection. They also found that the placenta contains a unique pattern of cell surface proteins (TMPRSS2 and ACE2) that are important for COVID-19 viral entry, which is different from other cell types. The demographics of mother-baby dyads were also studied and no differences were found to be significant, showing the fetal transmission does not discriminate.

"Determining how the placenta could be preventing COVID-19 infections during pregnancy can help provide clues on how to prevent infection in other organs, such as the lungs and gut," said Elizabeth Taglauer, MD, Ph.D., a neonatologist and placental biologist based at Boston Children's Hospital. "As a readily available tissue for research, the placenta can be a valuable source of scientific study for a variety of human diseases in pregnancy and beyond."

More information: Elizabeth Taglauer et al, Consistent localization of SARS-CoV-2 spike glycoprotein and ACE2 over TMPRSS2 predominance in placental villi of 15 COVID-19 positive maternal-fetal dyads, *Placenta* (2020). [DOI: 10.1016/j.placenta.2020.08.015](https://doi.org/10.1016/j.placenta.2020.08.015)

Provided by Boston Medical Center

Citation: Researchers identify proteins that prevent COVID-19 transmission through the placenta (2020, September 2) retrieved 3 May 2024 from <https://medicalxpress.com/news/2020-09-proteins-covid-transmission-placenta.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.