

Scientists unlock secrets of maternal/fetal cellular communication during pregnancy

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Researchers have unlocked mysteries surrounding how a pregnant mother's cells and her fetus' cells communicate throughout pregnancy. With this new information, The University of Texas Medical Branch at Galveston team and their colleagues in South Korea can develop new non-invasive methods of monitoring and improving the health of the

fetus using this mode of communication. The findings are now available in the *American Journal of Obstetrics and Gynecology*.

"During pregnancy, there is constant communication between maternal and [fetal cells](#) using sacs filled with chemicals called exosomes," said senior author Ramkumar Menon, UTMB associate professor in the department of obstetrics and gynecology. "Our prior studies have shown that the fetal exosomes signal to the mother's body that her/his organs have fully matured, which triggers the labor and delivery process. Given this, we sought out to learn more about the extent and capabilities of this communication system in order to develop new ways to monitor and support the fetus during pregnancy."

To test exosome trafficking and function, the research team used mice that were genetically engineered to have certain [exosome](#) proteins glow florescent red and green when blood and [tissue samples](#) are stained and viewed under a microscope in order to distinguish between the fetal and maternal exosomes.

The researchers learned that isolating and tracking fetal exosomes travelling to the maternal side is a useful indicator of the fetus's health and development that can be measured in minimally invasive maternal blood samples. Likewise, they now know that trafficking of exosomes from the maternal side to the fetus produces functional changes.

"We've just received a \$ 1.5 million three-year contract to test a novel approach in treating preterm birth," said Menon. "We will test the usefulness of drugs enclosed in exosomes that can potentially cross the placenta barrier, reach the [fetus](#) and prevent fetal inflammation, a major cause of [preterm birth](#) for which there is currently no drug treatment. Fetal inflammatory response is primarily responsible for preterm delivery, which impacts 15 million pregnancies yearly and responsible for 1 million neonatal deaths."

More information: Samantha Sheller-Miller et al, Cre-Reporter Mouse Model to Determine Exosome Communication and Function during Pregnancy, *American Journal of Obstetrics and Gynecology* (2019). [DOI: 10.1016/j.ajog.2019.06.010](https://doi.org/10.1016/j.ajog.2019.06.010)

Provided by University of Texas Medical Branch at Galveston

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