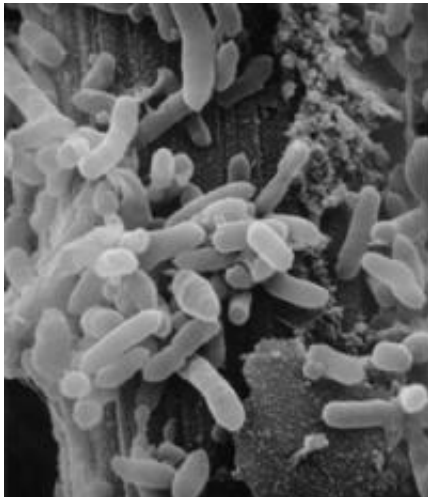


'Unhealthy' changes in gut microbes benefit pregnant women

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Bacteroides thetaiotaomicron, a beneficial gut bacterium.
Image: Lars Angenent

The composition of microbes in the gut changes dramatically during pregnancy, according to a study published by Cell Press in the August 3rd issue of the journal *Cell*. Although these changes are associated with metabolic disease under most circumstances, they could be beneficial in pregnant women.

"This is the first in-depth characterization of the gut microbiota associated with [pregnancy](#)," says senior study author Ruth Ley of Cornell University. "The findings suggest that our bodies have coevolved with the microbiota and may actually be using them as a tool to help alter the mother's metabolism to support the growth of the fetus."

In nonpregnant animals, changes to gut microbe composition can cause symptoms of metabolic syndrome, including weight gain, abnormal glucose metabolism, and inflammation—an immune response that normally protects the body but can cause health problems. These symptoms also appear during pregnancy, but the underlying

causes have been unclear, and few studies have examined the potential link to gut microbiota during pregnancy.

To address this question, Ley and her team obtained stool samples from 91 [pregnant women](#). They found that gut [microbes](#) changed in composition from the first trimester to the third trimester, becoming less "normal" and less diverse over time. Health-boosting bacteria decreased in abundance, while disease-related bacteria increased in number. In addition, signs of inflammation increased over the course of the pregnancy. "The changes in [gut microbes](#) were not related to diet, so we think the immune system or hormones play a role," Ley says.

When gut microbes from pregnant women were transferred to healthy germ-free mice, animals that received microbes from the third trimester became fatter and had higher levels of inflammation markers and worse glucose metabolism than mice that received microbes from the first trimester.

"By the third trimester, the microbiota can induce changes in metabolism," Ley says. "In the context of pregnancy, these metabolic changes in the mother are healthy, because they promote energy storage in fat tissue and help support the fetus. Outside of pregnancy, however, these changes can lead to the development of type 2 diabetes and other health problems."

More information: Koren et al.: "Remodeling of the gut microbiome and metabolic changes during pregnancy." [DOI:10.1016/j.cell.2012.07.008](https://doi.org/10.1016/j.cell.2012.07.008)

Provided by Cell Press

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