

Study: Mother's gut microbiota may shape metabolism of offspring

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A team of researchers affiliated with a large number of institutions across Japan has found that in mice, a mother's gut microbiota may shape the metabolism of her offspring in later life. In their paper

published in the journal *Science*, the group describes their studies with mouse models and what they learned from them. Jane Ferguson with Vanderbilt University Medical Center has published a Perspective [piece](#) on the work done by the team in the same journal issue.

As Ferguson notes, much research has been conducted to learn more about the impact of a mother's gut [microbiome](#) on the health of her baby, but the connection between a mother's gut microbiome and the baby's [gut microbiome](#) is little understood. In this new effort, the researchers sought to learn more about the possible role a mother's microbiome plays in the development of metabolic disease in offspring in later life that are related to microbiome conditions during pregnancy. To that end, they studied pregnant mice that lived under both normal and germ-free conditions to see if there might be any differences.

The researchers found that as offspring developed, those born to mothers who had lived in a germ-free environment during their pregnancy (and thus had no microbiome) were more likely to develop diseases such as obesity and glucose intolerance later in life. To find out why this was happening, the researchers took a closer look at short chain [fatty acids](#) (SCFAs)—metabolites that are driven by microbiota and help to fuel cells. They also serve as a means for communicating signals between gut microbes and other organs in the body. The researchers discovered that some SCFAs produced by the mother dictated the differentiation of the offspring's neural, pancreatic and intestinal cells via signaling of specific SCFA protein receptors residing on fat cells. They also found that this process helped balance energy levels in offspring—without them, [offspring](#) were more susceptible to metabolic diseases.

The next step for the researchers is to find out if SCFAs work the same way in humans, and if so, to find out if prescribing supplements to pregnant women might reverse the problem.

More information: Ikuo Kimura et al. Maternal gut microbiota in pregnancy influences offspring metabolic phenotype in mice, *Science* (2020). [DOI: 10.1126/science.aaw8429](https://doi.org/10.1126/science.aaw8429)

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