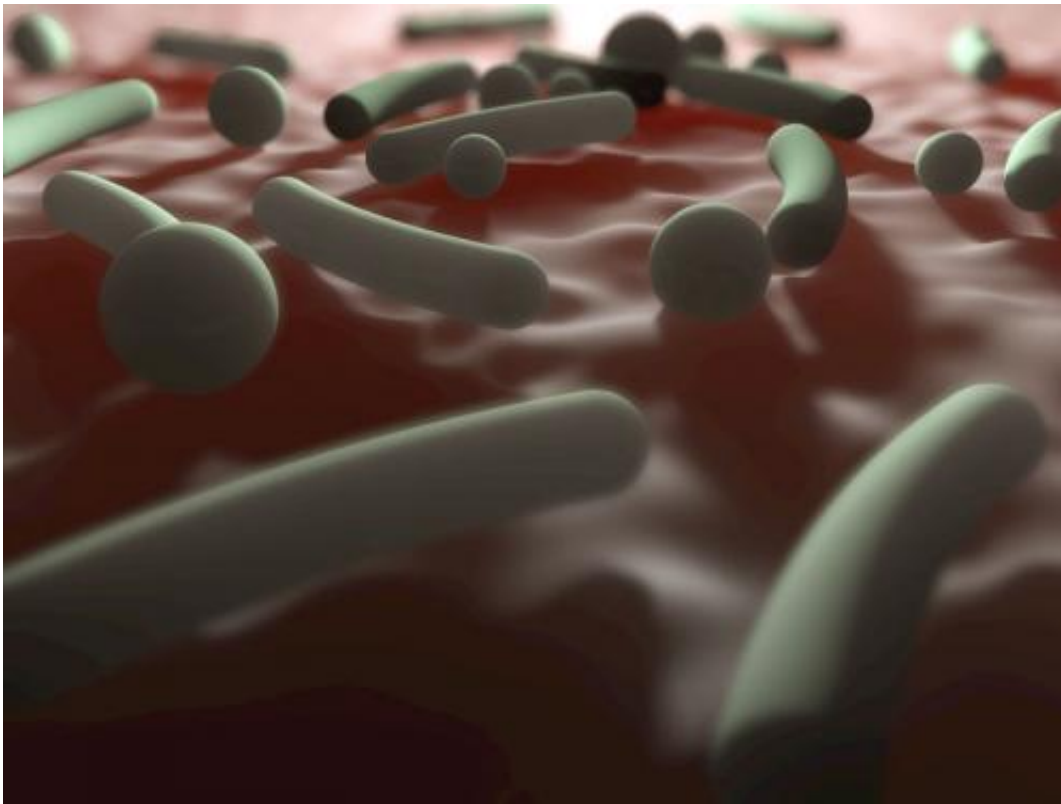


Bacteria live even in healthy placentas, study finds

May 21 2014, by Lauran Neergaard



In this study, researchers analyzed placental specimens from 320 subjects, providing an initial view of the human placental microbiome, which had not previously been studied in such detail. Credit: V. Altounian/Science Translational Medicine

Surprising new research shows a small but diverse community of bacteria lives in the placentas of healthy pregnant women, overturning

the belief that fetuses grow in a pretty sterile environment.

These are mostly varieties of "good germs" that live in everybody. But Wednesday's study also hints that the make-up of this microbial colony plays a role in [premature birth](#).

"It allows us to think about the biology of pregnancy in different ways than we have before, that pregnancy and early life aren't supposed to be these totally sterile events," said lead researcher Dr. Kjersti Aagaard of Baylor College of Medicine in Houston.

We share our bodies with trillions of microbes—on the skin, in the gut, in the mouth. These communities are called our [microbiome](#), and many bacteria play critical roles in keeping us healthy, especially those in the intestinal tract. A few years ago, the government's Human Microbiome Project mapped what makes up these colonies and calculated that healthy adults cohabitate with more than 10,000 species.

Healthy newborns pick up some from their mother during birth, different bugs depending on whether they were delivered vaginally or by C-section.

What about before birth? There have been some signs that the process could begin in-utero.

But, "we have traditionally believed in medicine that the uterus is a sterile part of the human body," said Dr. Lita Proctor of the National Institutes of Health, who oversaw the microbiome project.

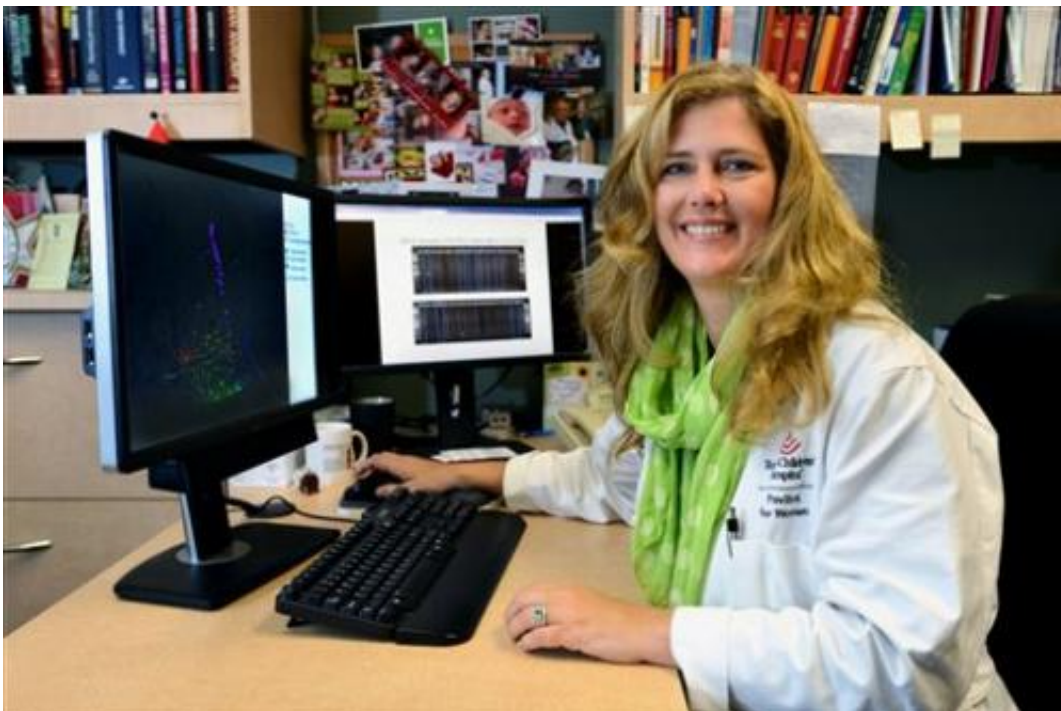
With the new research, "we realize that microbes may play a role even in fetus development," added Proctor, who wasn't involved in the work. "The results of this study now open up a whole new line of research on maternal and pediatric health."

Aagaard's team earlier had studied the microbiome of the vagina, and learned that its composition changes when a woman becomes pregnant. The puzzle: The most common vaginal microbes weren't the same as the earliest [gut bacteria](#) that scientists were finding in newborns.

What else, Aagaard wondered, could be "seeding" the infants' [intestinal tract](#)?

With colleagues from Baylor and Texas Children's Hospital, Aagaard analyzed 320 donated placentas, using technology that teases out bacterial DNA to evaluate the type and abundance of different microbes.

The placenta isn't teeming with microbes—it harbors a low level, Aagaard stressed. Among them are kinds of E. coli that live in the intestines of most healthy people.



This handout photo provided by the Baylor College of Medicine, taken May 20, 2014, shows Dr. Kjersti Aagaard in her laboratory at the Baylor College of

Medicine in Houston. Aagaard's new research shows a small but diverse community of bacteria lives in the placentas of healthy pregnant women, and hints that the microbes may play a role in premature birth. (AP Photo/Agapito Sanchez, Baylor College of Medicine)

But to Aagaard's surprise, the placental microbiome most resembled bacteria frequently found in the mouth, she reported in the journal *Science Translational Medicine*. The theory: Oral microbes slip into the mother's bloodstream and make their way to the placenta.

Why does the body allow them to stay? Aagaard said there appears to be a role for different microbes. Some metabolize nutrients. Some are toxic to yeast and parasites. Some act a bit like natural versions of medications used to stop preterm contractions, she said.

In fact, among the 89 placentas that were collected after preterm births, levels of some of the apparently helpful bacteria were markedly lower, she said.

Aagaard is beginning a larger study to explore the link, planning to analyze the oral and placental microbiomes of more than 500 [pregnant women](#) at risk of preterm birth.

More information: "The Placenta Harbors a Unique Microbiome," by K. Aagaard et al. *Science Translational Medicine*, 2014.

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