

Baboon friends swap gut germs

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Baboons take turns grooming each other to make friends and cement social bonds. A new study finds that baboon friendships influence the microscopic bacteria in their guts. Credit: Elizabeth Miller, University of Notre Dame.

The warm soft folds of the intestines are teeming with thousands of species of bacteria. Collectively known as the gut microbiome, these microbes help break down food, synthesize vitamins, regulate weight and resist infection.

If they're so key to health, what factors shape an individual's gut microbial makeup?

Previous studies have pointed to the food we eat, the drugs we take, genetics, even our house dust. Now, a new study in baboons suggests that relationships may play a role, too.

The researchers studied social interactions, eating habits and bacteria in the feces of 48 wild baboons from two groups living near Mount Kilimanjaro in Kenya. Their findings appear in the March 16 issue of the journal *eLife*.

"Poop contains a goldmine of data," said Duke University biologist Jenny Tung, who co-authored the study. "Ninety-eight percent of the DNA in poop doesn't come from the animal itself or the foods they eat—it's bacterial."

Using powerful sequencing machines to tease out each microbe's unique genetic signature, the researchers identified the names and relative amounts of nearly 1,000 bacterial species thriving in the baboons' bowels.

The cast of characters includes relatively high levels of Firmicutes, Proteobacteria, Actinobacteria and Bacteroidetes—all of which are also commonly found in human guts.

Baboons from the same troop had more similar gut [microbes](#) than baboons from different troops.

The results are consistent with previous studies in humans showing that people who live together harbor similar gut germs. The connection has largely been attributed to couples and housemates eating many of the same foods in the same relative proportions, but Tung and co-author

Elizabeth Archie of the University of Notre Dame and colleagues wondered if additional factors might be at play.

To find out, the researchers recorded what the animals ate—a menu of grass seeds and stems, acacia seed pods, fruits and leaves.

They also noted when the baboons in each group hung out in close proximity to each other without physical contact, and measured how often they groomed each other.

They found that, in both groups, baboons who groomed each other more often shared more similar sets of [gut microbes](#).

How friendly two baboons were to each other was a better predictor of how alike their gut bacterial communities were than whether they merely hung out in the same places, were related, or what they ate.

How fecal bacteria find their way from a baboon's colon to her fur and from there to another baboon's gut is unclear, but the researchers have a few ideas.

"When [baboons](#) groom each other they're combing through each other's fur for parasites, dirt, dead skin. Sometimes they pull things off and put them in their mouths," Archie said.

"Males and females also spend a lot of time grooming close to the genital area during estrous," Tung said.

Hugging and cuddling and other forms of [physical contact](#) could play a role in allowing people to swap [gut](#) germs, too, the researchers say, especially after touching surfaces such as bathroom sinks and toilet handles.

"This is another way that social relationships can influence your health," Archie said. "Not only are relationships important for the transmission of harmful bacteria like the ones that cause pneumonia or strep throat, but they're important for the transmission of microbes that are harmless or potentially good for you, too."

More information: "Social Networks Predict Gut Microbiome Composition in Wild Baboons," Tung, J. et al. *eLife*, March 16, 2015. [dx.doi.org/10.7554/eLife.05224 ... sthash.3coIKCFq.dpuf](https://doi.org/10.7554/eLife.05224...sthash.3coIKCFq.dpuf)

Provided by Duke University

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