

Team discovers link between lifestyles of indigenous communities and gut microbial ecologies

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An international team of researchers led by the University of Oklahoma has discovered a strong association between the lifestyles of indigenous communities and their gut microbial ecologies (gut microbiome), a study that may have implications for the health of all people.

Under the direction of Cecil Lewis, co-director of the Laboratories of Molecular Anthropology and Microbiome Research in the OU College of Arts and Sciences, the team presents an in-depth analysis of the [gut microbiome](#) of the Matses, an Amazonian hunter-gatherer community, which is compared with that of the village of Tunapunco, who are highland small-scale farmers, as well as with urban city-dwellers in Norman, Okla.

In comparing the three groups to previously published studies in Africa and South America, the team observed a striking trend. Human gut microbiota cluster together based on subsistence strategy more than geographic proximity. Thus, hunter-gatherers in South America and Africa are more similar to each other than either are to rural agriculturalists or to urban-industrialists, even from neighboring populations.

It is now well accepted that human gut microbiomes are actively involved in health and that changes in our [gut microbes](#) from living more sanitized, industrialized lifestyles, has led to susceptibility to certain

autoimmune disorders like asthma and allergies.

Also, it has become clear that industrialization has led to a decrease in gut microbiome diversity. Moreover, in the gut of industrialized peoples, one particular bacteria genus is conspicuously absent, *Treponema*. These bacteria have co-existed with humans and other primates for millions of years, so their absence in industrialized people is disconcerting.

"In our study, we show that these lost bacteria are in fact multiple species that are likely capable of fermenting fiber and generating short chain fatty acids in the gut. Short chain fatty acids have anti-inflammatory properties. This raises an important question, could these lost *Treponema* be keystone species that explain the increased risk for autoimmune disorders in industrialized people? This is what we hope to explore next," says Lewis.

R. Tito notes that, after the team's visit, the Matsigenka community's hunter-gather lifestyle had begun to change to one that includes industrial food. "It is possible that their current profile is changing, and we have a unique opportunity to appreciate the biological impact of urban transition in the [gut](#) microbiome," states Tito.

"Studying native human communities provides an opportunity to explore human biological phenomena that might have disappeared in western societies; however, we need to be conscious of the challenges of working with vulnerable human populations," says Obregon-Tito.

An article on this study provides a model for the social inclusion of [indigenous communities](#) in research. The project was led by OU, hosted at the Universidad Científica del Sur in Lima-Peru, and monitored by the Research Ethics Committee of the Peruvian National Institute of Health. The article is available in *Nature Communications* at www.nature.com/naturecommunications .

Provided by University of Oklahoma

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