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Microbial cooperation in the intestine

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The human intestine is home to a dense and diverse ecosystem of microbes, but little is known about how the abundant bacteria in our gut interact with each other. In a new study published in *Nature* this week, Brigham and Women's Hospital (BWH) investigators, in collaboration with colleagues at Boston Children's Hospital, report on a rare example of cooperation between different species of bacteria.

The team found that one species of bacteria, *Bacteroides ovatus*, digests a dietary polysaccharide - a complex carbohydrate - at a cost to itself but at a benefit to another species. Using in vitro experiments and a mouse model, the team found that *B. ovatus* receives reciprocal benefits from other gut species in return.

"Finding a predominant member of our microbiota that doesn't need to digest a dietary sugar in order to use it for itself, but that seems to be doing so to feed another species of bacteria was a big surprise," said lead author Seth Rakoff-Nahoum, MD PhD, of Boston Children's Hospital's Division of Infectious Diseases.

"Such interspecies cooperative interactions are rarely described, especially among the abundant bacteria in our intestines," said senior author Laurie Comstock, PhD, of BWH's Division of Infectious Diseases.

Kevin Foster of Oxford University also contributed to this work.

More information: Seth Rakoff-Nahoum et al, The evolution of

cooperation within the gut microbiota, *Nature* (2016). DOI: 10.1038/nature17626