More studies of breast milk could lead to healthier guts for everyone

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Image: Wikipedia.

(Medical Xpress)—A pair of researchers has published a Persptctive piece in the journal *Science*, calling for more research into the ways breast milk impacts fetal development. In their paper, Katie Hinde, of Harvard University and Zachery Lewis with the University of California describe the current state of breast milk research and how it relates to fetal health and development and why they believe more research needs to be done.

Over the past several years, the human gut biome has received more scrutiny as the part it plays in health has been found to play a much

larger role than thought. People can now take pre or pro-biotics to "enhance" their own person biome, though it is still not clear just how much benefit they get. One important factor, Hinde and Lewis note, that has not received much attention is breast milk and the impact it may have on the gut biome of a developing fetus. They point out that having the right bacteria in the gut in the right amounts is critical for an infant's good health in large part because of the impact it has on the immune system.

Human breast milk, the two authors note has more oligosaccharides (types of sugars) in it than other animals, and they are more diverse as well. And because our guts are incapable of breaking down those sugars, it seems clear that they are present in breast milk to feed microbes in out gut that offer benefits to us, otherwise why would mothers be producing them? They also note that not all human breast milk is the same—the oligosaccharides can differ depending on a variety of factors, one of which is the gender of the child they bear.

The authors conclude by suggesting that more research could lead to healthier people in general by aiding in the development of formula, for example, that is most beneficial to a given child, or by highlighting which sorts of microbes might be best for pre or pro-biotics meant to boost the immune system. It might be good to know also, they add, what the long term impact of breast milk is on the human gut biome and on human health in general.

More information: Mother's littlest helpers, *Science* 26 June 2015: Vol. 348 no. 6242 pp. 1427-1428. DOI: 10.1126/science.aac7436

Abstract
Commensal bacteria underlie, in part, our nutritional status, immune function, and psychological well-being. The trillions of beneficial microbes within our intestinal tract convert dietary nutrients, inhibit

pathogen colonization, regulate immune processes, and produce neural signals (1, 2). Advances in our understanding of the importance of microbes have motivated the commercial development of products intended to boost "good" commensals and confer health benefits. Probiotic dietary supplements contain live beneficial microbes hoped to subsequently colonize the gut. Prebiotic nutrients are thought to enhance good gastrointestinal microflora by preferentially nourishing beneficial microbes. Even "psychobiotics" are being explored to ameliorate symptoms of psychiatric illness. These live organisms influence the brain through metabolites and neuroactive compounds in rodent models and preliminary human studies (3). How to most effectively be the landscape architects of our microbial community, however, often remains unclear. An opportunity to gain insights into how natural selection has shaped the coevolution of hosts and microbes can be found in mammalian mother-infant dyads, as our microbiota are ecologically engineered by mothers and breastmilk. Such insights can be leveraged to improve clinical management and nutritional technologies, enhancing human health not just in infancy, but across the life course (4, 5).