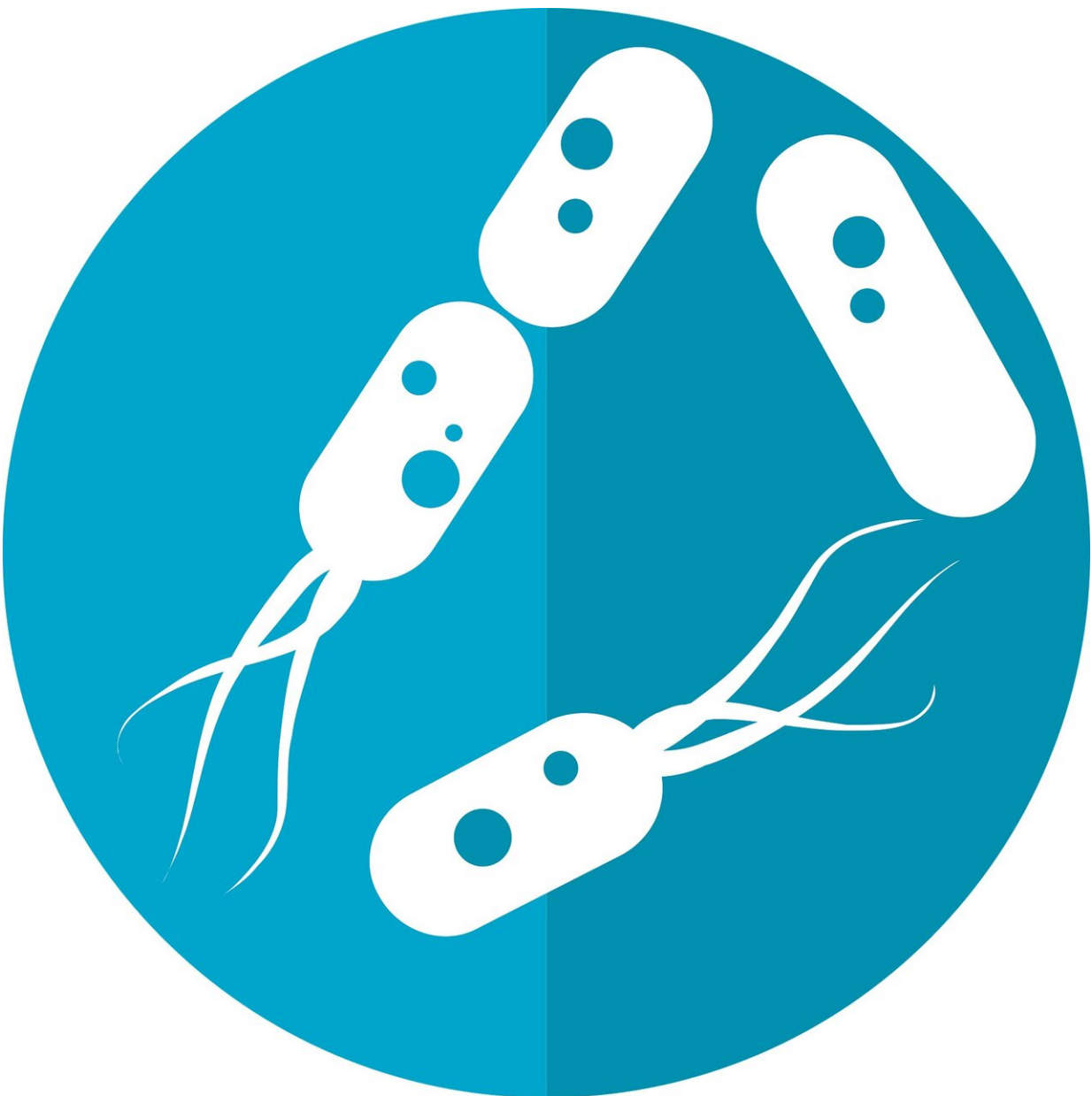


Study finds probiotic supplement helps to form a mature microbiome in extremely preterm infants

May 20 2022



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University of Calgary researchers have shown probiotic supplements can help form a healthy microbiome in the gut of the tiniest infants who are born without a fully formed gut microbiome. The study found that a specific mix (five species) of probiotic supplement accelerated the maturation of the microbiome into a term-like state and reduced intestinal inflammation in extremely preterm infants.

"These are the tiniest of [preterm infants](#) who spend the first months of their life in [neonatal intensive care](#)," says Dr. Marie-Claire Arrieta, Ph.D., an assistant professor at the Cumming School of Medicine (CSM) and co-principal investigator on the study. "The findings show that a daily [probiotic](#) supplement containing the right type of microbes prompted a rapid transition of the gut microbiome to what is normally observed in healthy, breastfed infants born at term. This mature microbiome is more stable, more resilient and was linked to reduced inflammation in the babies' gut."

The randomized clinical trial, conducted at the Neonatal Intensive Care Unit (NICU) at the Foothills Medical Centre, included infants born at less than 29 weeks gestation, and weighing less than one kilogram at birth. While probiotics are often recommended to moderately premature infants to prevent serious gastrointestinal inflammation and sepsis, there isn't sufficient evidence to recommend probiotic use in extremely premature infants, even if this group is at the highest risk of these conditions. Given that the gut microbiome contributes to these diseases, the researchers wanted to know whether probiotics supplements impacted the development of the gut microbiome. A fully developed gut

microbiome is essential to the body's [immune defense](#).

"The gut microbiome is a complex community containing different species of microorganisms that contribute to important aspects of the immune system, including fighting pathogens and preventing immune diseases, such as asthma and Type 1 diabetes," says Dr. Jumana Samara, MD, neonatologist at the FMC and first author of this study. "We found that the bifidobacterial strains within the probiotic supplement acted like an ecosystem engineer, promoting microbiome growth, connections between species and microbiome stability. It also dampened [intestinal inflammation](#)."

When infants are born very prematurely, they experience many factors that impact the development of the microbiome, like the almost universal introduction of life-saving antibiotics, known to alter the microbiome. Their immature microbiome looks very different than that of an infant born at term, with very reduced numbers of bifidobacterial species, which are essential to a healthy infant microbiome. Their immature [gut microbiome](#) also has high numbers of potential pathogens that can cause life threatening infections.

"Due to their immature digestive and immune systems, preterm babies face unique challenges when it comes to feeding. The blend of probiotics in our study resulted in better feeding tolerance and reduced signs of allergic reaction in babies' digestive system," says Dr. Belal Alshaikh, MD, a neonatologist at the Foothills Medical Centre and co-principal investigator. "Some probiotic strains were found in the gut after six months of stopping probiotics and may have contributed to the low occurrence of food allergy after hospital discharge".

While the study suggests that probiotics can improve immune and digestive health of preterm babies, Alshaikh says there is still a need for more research to identify the best probiotic blend and confirm the safety

of available commercial products. He adds, parents should check with their healthcare provider before administering probiotics to a newborn.

Many of the infants in this study are part of a larger study of premature infants led by Arrieta and her team: the [Alberta BLOOM](#) study. This study is following the health and the microbiome of [premature infants](#) throughout their childhood. The researchers' next goal is to understand how this early [microbiome](#) intervention may impact the babies' health as they grow.

Findings are published in *Cell Host & Microbe*.

More information: Jumana Samara et al, Supplementation with a probiotic mixture accelerates gut microbiome maturation and reduces intestinal inflammation in extremely preterm infants, *Cell Host & Microbe* (2022). [DOI: 10.1016/j.chom.2022.04.005](https://doi.org/10.1016/j.chom.2022.04.005)

Provided by University of Calgary

Citation: Study finds probiotic supplement helps to form a mature microbiome in extremely preterm infants (2022, May 20) retrieved 25 April 2024 from <https://medicalxpress.com/news/2022-05-probiotic-supplement-mature-microbiome-extremely.html>

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