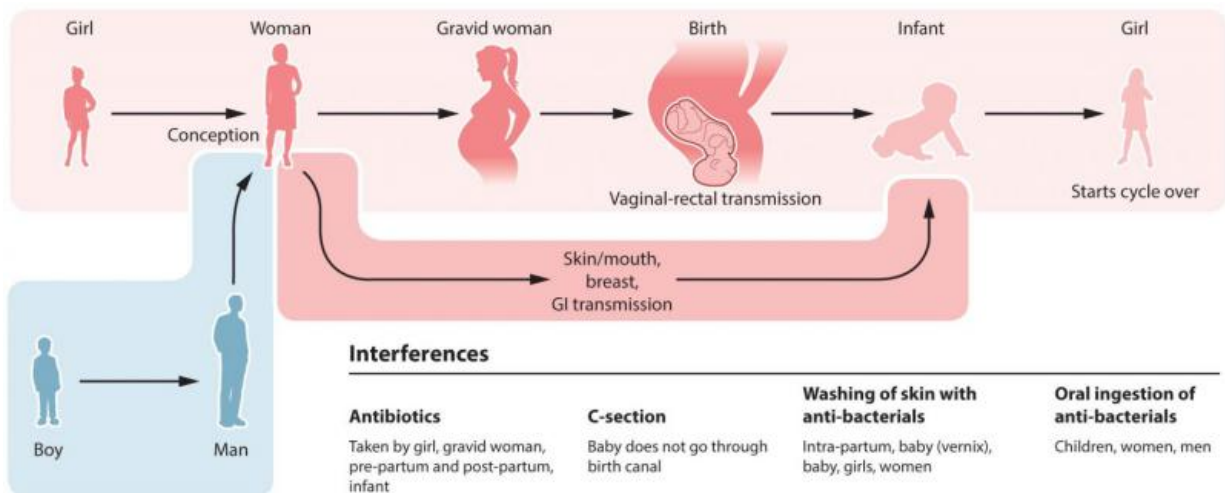


Four gut bacteria decrease asthma risk in infants

September 30 2015



Steps involved in the cycle of healthy microbiota development and its interactions with host development, from the womb, to birthing and nursing, to tissue development. Practices that eliminate or minimize acquisition of microbiota, including C-section, early/extensive washing, antibiotic exposures, and exclusive formula feeding, may have costs. Credit: C. Bickel / Science Translational Medicine

New research by scientists at UBC and BC Children's Hospital finds that infants can be protected from getting asthma if they acquire four types of gut bacteria by three months of age. More than 300 families from across Canada participated in this research through the Canadian Healthy Infant Longitudinal Development (CHILD) Study.

"This research supports the [hygiene hypothesis](#) that we're making our environment too clean. It shows that [gut bacteria](#) play a role in asthma, but it is early in life when the baby's immune system is being established," said the study's co-lead researcher B. Brett Finlay, Peter Wall Distinguished Professor in the Michael Smith Laboratories and the departments of [microbiology](#) & immunology and biochemistry and molecular biology at UBC.

Asthma rates have increased dramatically since the 1950s and now affect up to 20 per cent of [children](#) in western countries. The discovery opens the door to developing probiotic treatments for [infants](#) that prevent asthma. The finding could also be used to develop a test for predicting which children are at risk of developing asthma.

The researchers analyzed fecal samples from 319 children involved in the CHILD Study. Analysis of the gut bacteria from the samples revealed lower levels of four specific gut bacteria in three-month-old infants who were at an increased risk for asthma.

Most babies naturally acquire these four bacteria, nicknamed FLVR (Faecalibacterium, Lachnospira, Veillonella, Rothia), from their environments, but some do not, either because of the circumstances of their birth or other factors.

The researchers also found fewer differences in FLVR levels among one-year-old children, meaning the first three months are a critical time period for a baby's developing immune system.

The researchers confirmed these findings in mice and also discovered that newborn mice inoculated with the FLVR bacteria developed less severe asthma.

"This discovery gives us new potential ways to prevent this disease that is

life-threatening for many children. It shows there's a short, maybe 100-day window for giving babies therapeutic interventions to protect against asthma," said co-lead researcher Dr. Stuart Turvey, pediatric immunologist, BC Children's Hospital, director of clinical research and senior clinician scientist at the Child & Family Research Institute, Aubrey J. Tingle Professor of Pediatric Immunology at UBC.

The researchers say that further study with a larger number of children is required to confirm these findings and reveal how these bacteria influence the development of [asthma](#).

The study was published today in in *Science Translational Medicine*.

More information: Early infancy microbial and metabolic alterations affect risk of childhood asthma, *Science Translational Medicine*, stm.sciencemag.org/lookup/doi/...scitranslmed.aab2271

Provided by University of British Columbia

Citation: Four gut bacteria decrease asthma risk in infants (2015, September 30) retrieved 2 April 2024 from <https://medicalxpress.com/news/2015-09-gut-bacteria-decrease-asthma-infants.html>

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