

Exposure to antibiotics linked to severity of allergic asthma: research

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Widely used antibiotics may increase incidence and severity of allergic asthma in early life, according to a University of British Columbia study.

The study, published today in the journal [EMBO reports](#), shows that certain antibiotics that affect [intestinal bacteria](#) also had a profound impact on [allergic asthma](#).

"It has long been suspected that kids exposed to more antibiotics – like those in developed countries – are more prone to allergic [asthma](#)," says the study's author, UBC microbiologist Brett Finlay. "Our study is the first experimental proof that shows how."

Finlay's team at UBC's Dept. of Microbiology and Immunology and Michael Smith Laboratories examined how two widely used antibiotics – streptomycin and vancomycin – affected the bacterial "ecosystem" in the gut. They found that vancomycin profoundly alters the bacterial communities in the intestine and increases severity of asthma in mouse models.

The same antibiotics do not impact adult mice's susceptibility to asthma, indicating that early life is a critical period of establishing a healthy immune system.

Allergic asthma affects more than 100 million people worldwide and its prevalence is increasing on average by 50 per cent every decade, particularly among children in industrialized countries. According to the

Asthma Society of Canada, asthma affects at least 12 per cent of Canadian children.

The human gut is colonized by approximately 100 trillion bacteria, and contains upwards of 1,000 bacterial species. While not fully understood, these micro-organisms, known as "gut flora," perform a host of useful functions, says Finlay.

"Modern societal practices, such as improved sanitation methods and widespread antibiotic use, are causing the disappearance of ancestral species of bacteria in our gut that may be critical to a healthy immune system," says Finlay.

"Our study shows this is the case with certain antibiotics and allergic asthma, and the gut-lung connection is also consistent with observations that incidence of asthma has not increased significantly in developing countries where antibiotic use is less prevalent – and in turn, the gut flora is permitted to fully develop."

The study is funded by the Canadian Institutes of Health Research (CIHR) through the Canadian Microbiome Initiative, in partnership with Genome BC and the Allergy, Genes and Environment Network (AllerGen NCE).

Marc Ouellette, Scientific Director of CIHR's Institute of Infection and Immunity, noted the importance of the team's results: "It has been recognized that microbes play an important role in human health – and we are discovering that a disruption of these bugs is associated with a number of chronic health conditions. The important results from Prof. Finlay's team confirm that giving [antibiotics](#) to young children, which disturb their normal bacterial flora, should not be taken lightly."

Provided by University of British Columbia

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