

# Microbiome-related differential effects of a probiotic on allergic airway inflammation

Mateus Barbosa Casaro  
Andrew Thomas  
Eduardo Mendes  
Claudio Fukumori  
Willian Ribeiro  
Fernando Oliveira  
Amanda Crisma  
Gilson Murata  
Bruna Bizzarro  
Anderson Sá-Nunes  
João Setubal  
Marcia Mayer  
Flaviano Martins  
Ana Tada Antiorio  
Wothan Tavares-de-Lima  
Niels Camara  
Rui Curi  
Emmanuel Dias-Neto  
Caroline Marcantonio Ferreira

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## Video Byte

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# Abstract

The severity of allergic airway diseases, such as asthma, is affected by the interaction between genetics and the gut microbiome. Probiotic supplements are widely used and can alter the gut microbiome, but whether they can help prevent or alleviate allergic airway inflammation is unclear. The current study investigated the effects of gut microbiome modulation in two strains of mice: C57BL/6 mice and mice with increased susceptibility to airway inflammation (A/J mice). The susceptible A/J mice had less diverse gut microbiomes than the C57BL/6 mice and treatment with an acetate-producing probiotic altered the levels of certain bacteria differently in the different mouse strains. After airway inflammation was chemically induced, probiotic administration helped alleviate inflammation only in the susceptible A/J strain, partly by increasing acetate levels. The researchers also implanted female C57BL/6 mice with susceptible A/J embryos to naturally change the gut microbiomes of the embryos and found both increased gut microbiome diversity and reduced inflammation in the A/J offspring. Although studies in humans are needed, the results show that the effects of probiotic supplementation can differ depending on the host microbiome and that manipulating the gut microbiota may help reduce the severity of allergic airway inflammation.