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Oral administration with *Lactobacillus reuteri* attenuated food allergic responses and enhanced the reactivity of regulatory T cells in BALB/c mice

Chung-Hsiung Huang¹,², Tong-Rong Jan²

¹National Institute of Infectious Diseases and Vaccinology, National Health Research Institutes, Miaoli, Taiwan; ²Department and Graduate Institute of Veterinary Medicine, School of Veterinary Medicine, National Taiwan University, Taipei, Taiwan

Aims: To investigate the anti-allergic and immunomodulatory effects of *Lactobacillus reuteri* in a murine model of food allergy.

Methods: BALB/c mice were sensitized with ovalbumin (OVA) plus alum and subsequently challenged with OVA by gavage to induce food allergy. The mice were daily administered with *L. reuteri* (1 x 10⁹ CFU/mouse) and/or MRS broth (as vehicle) throughout the entire period of experiment. Allergic diarrhea was monitored after each OVA challenge, and the mice were sacrificed post the last OVA challenge to collect serum samples, spleen and duodenal tissues for immunological and histopathological analysis.

Results: *L. reuteri* administration attenuated the occurrence of diarrhea, intestinal mast cell activation, and serum IgE production. Furthermore, both the production of IFN-γ and IL-4 by splenocytes was suppressed by *L. reuteri*. Concordantly, a decreased expression of IL-4, IFN-γ, GATA3 and T-bet were observed in the duodenum. However, the expression of IL-10, TGF-β and Foxp3 was augmented.

Discussion: These findings demonstrate that oral administration with *L. reuteri* attenuated allergic responses and down-regulated both T helper (Th)1 and Th2 immune responses, which was closely associated with the enhanced reactivity of regulatory T cells.

Conclusion: *L. reuteri* may be used as a functional probiotic for managing intestinal disorders associated with exaggerated immune responses, especially food allergy.