Prevention of Allergy by Oral Feeding of *Bifidobacterium* sp. BGN-4 in a Murine Model of Ovalbumin Hypersensitivity

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ABSTRACT

We investigated whether orally administered probiotic bacteria (*Bifidobacterium bifidum* and *Lactobacillus casei*) and a gram-negative bacterium (*E. coli*) function as allergic-immune challengers to prevent food allergy, according to the hygiene hypothesis. C3H/HeJ mice were sensitized with ovalbumin (OVA) and cholera toxin (CT) for 5 weeks. After sensitization, the OVA-induced mice that were not treated with bacteria (sham) had significantly increased levels of OVA-specific IgE, total IgE, and IgG1 in sera, as well as scab-covered tails. In comparison, groups treated with *Bifidobacterium bifidum* BGN4, *Lactobacillus casei* 911, or *Escherichia coli*MC4100 had decreased levels of OVA-specific IgE, total IgE, and IgG1, as well as decreased levels of mast cell degranulation and tail scabs. OVA-specific IgA levels were decreased in BGN4- and *L. casei*-treated groups. In conclusion, administration of *E. coli*, BGN4, or *L. casei* decreased the OVA-induced allergy response. However, growth inhibition occurred in the *E. coli*-treated mice and the sham group. Thus, BGN4 and *L. casei* appear to be useful probiotic bacteria for the prevention of allergy.