

Effect of a ropy Exopolysaccharide-producing *Bifidobacterium animalis* subsp. *Lactis* strain orally administered on dss-induced colitis mice model

Hidalgo-Cantabrana C.

Algieri F.

Rodriguez-Nogales A.

Veza T.

Martínez-Cambor P.

Margolles A.

Ruas-Madiedo P.

Gálvez J.

Exopolysaccharide (EPS)-producing bifidobacteria, particularly *Bifidobacterium animalis* subsp. *lactis* strains, are used in the functional food industry as promising probiotics with purported beneficial effects. We used three isogenic strains of *B. animalis* subsp. *lactis*, with different EPS producing phenotypes (mucoid-ropy and non-ropy), in order to determine their capability to survive the murine gastrointestinal tract transit, as well as to evaluate their role in improving clinical outcomes in a chemically-induced colitis model. The three strains were able to survive in the intestinal tract of C57BL/6J mice during the course of the intervention study. Furthermore, the disease activity index (DAI) of the animal group treated with the ropy strain was significantly lower than of the DAI of the placebo group at the end of the treatment. However, no significant differences were found among the three strains. The analysis of several immune parameters, such as TNF α and IL-10 quantified in blood plasma and lymphocyte populations enumerated in mesenteric nodes, showed some significant variations among the four experimental animal groups. Remarkably, a higher capability of the ropy strain to increase regulatory T-cells in mesenteric lymphoid nodes was demonstrated, suggesting a higher ability of this strain to regulate inflammatory responses at mucosal level. Our data indicate that strains of *B. animalis* subsp. *lactis* producing EPS that confer a mucoid-ropy phenotype could represent promising candidates to perform further studies targeting

intestinal inflammatory processes. © 2016 Hidalgo-Cantabrana, Algieri, Rodriguez-Nogales, Vezza, Martínez-Cambor, Margolles, Ruas-Madiedo and Gálvez.

Bifidobacterium

DSS-colitis

Exopolysaccharide

Immune modulation

Mouse model

Mucoid

Ropy

exopolysaccharide

interleukin 10

tumor necrosis factor alpha

animal experiment

animal model

animal tissue

Article

bacterial survival

Bifidobacterium animalis

Clinical Disease Activity Index

controlled study

dextran sodium sulfate-induced colitis

disease assessment

enzyme linked immunosorbent assay

feces analysis

freeze drying

gene expression

gene sequence

immune response

male

mouse

nonhuman

real time polymerase chain reaction

regulatory T lymphocyte

reverse transcription polymerase chain reaction