SUPPRESSION OF ABERRANT CRYPTS IN BALB/C MICE BY Bifidobacterium animalis ssp. lactis INL1

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Colorectal cancer (CRC) is considered the third highest mortality worldwide and has low remission rates. Numerous research groups have worked to discover prevention agents, or alternatives to conventional drug therapies, for intestinal syndromes, such as inflammatory bowel disease and CRC. Some experiments have demonstrated the antitumor effect of specific strains, including bifidobacteria. The mechanism of action attributed to these probiotics is not yet clear, however, their antioxidant and anti-inflammatory potential are some of the proposed mechanisms. *B. animalis* ssp. *lactis* INL1 (BAINL1) appears to have antioxidant and anti-inflammatory capacity. This research evaluated whether BAINL1 had potential antitumor activity by studying the suppression of aberrant crypts in BALB/C mice with induced colorectal cancer. In vitro antioxidant activity (DPPH and ABTS) and antitumor activity in an animal model were evaluated by counting aberrant crypts (AC) and aberrant crypt foci (ACF), in addition to analyzing enzymes involved in oxidative stress and markers of tissue inflammation (IL-10 and TNF?). The results demonstrated that exposure to BAINL1 promoted a 44.44% reduction in the number of total aberrant crypts in the diseased group, in addition to increasing catalase activity (145.20%) and the quantification of TNF? (266.31%). In vitro tests showed that the bacteria under test had antioxidant activity (79.18% by DPPH and 17.02% by ABTS). As demonstrated, BAINL1 had antioxidant activity in vitro, corroborating the results of other studies. In the animal model, Catalase activity was elevated in the presence of the probiotic, which may have contributed to a reduction in oxidative stress. BAINL1 alone was not able to modulate inflammatory mediators under study (TNF? and IL-10). In the complex context of interactions between the probiotic, endothelial cells and the adjunct immune system and commensal bacteria, it appears that interesting events can be favored by it, such as an increase in the release and IgA activity. Studies involving the dosage of this immunoglobulin, as well as IL-4, IL-6, IL-8, IL-12, among others, would be interesting in order to outline a profile of which modulators would be important in the context of probiotic exposure in the CRC induction model used. The effects of increasing this mediator are numerous and antagonistic. It is believed that this modulation can contribute to both worsening and improving the disease. Although this cytokine is primarily a pro-inflammatory mediator, in the complex context of interactions between the probiotic, endothelial cells and the adjunct immune system and commensal bacteria, it appears that interesting events can be favored by it, such as an increase in the release and furthermore, considering the various stages of CRC development. Regarding the direct microscopy stage, the results indicate that BAINL1 was able to partially suppress the appearance of aberrant figures in absolute counts, in addition to reducing the appearance of aberrant crypt foci and also improving the multiplicity profile of the number of ACF, when administered concomitantly with the carcinogen. These results point to possible antitumor activity. This study presents support that signals the possible antitumor activity of BAINL1 on CCR induced in an animal model, for oral exposure.

References

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