Utilizing Kefir Bacteria to Target NF-kB of the Bax Gene to Induce Apoptosis in Colorectal Adenocarcinoma Cells

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Kefir is fermented milk that is formulated with grains containing various bacteria and yeasts that coexist. In this study, the researcher has investigated the pro-apoptotic nature of kefir against a HT-29 human colorectal adenocarcinoma cell line. Studies have shown that transcription factor NF-kB can mediate up-regulation of the Bax pro-apoptotic gene. They have also indicated that kefir bacteria can stimulate apoptosis via the Bax gene. As a result, the researcher has investigated the mechanism in which kefir bacteria interfere with the Bax gene. He tested the cytotoxicity of kefir, three different Lactobacillus strains, and a yeast strain on colon cancer cells. Particular strains were chosen based on natural composition of kefir and strain percentages. The researcher hypothesized that kefir would be most cytotoxic to the HT-29 cells, and the cells would also contain the highest level of NF-kB. The researcher conducted a neutral red cell cytotoxicity assay as well as a NF-kB transcription factor assay to collect data. Ultimately, the researcher observed a significant cytotoxicity level of the kefir in comparison to other treatment groups. The disparity between kefir and other treatments remained consistent when the levels of NF-kB were measured. NF-kB was significantly higher in cancer cells treated with kefir when compared to the control or individual strains. The discovery of NF-kB as the mechanism for cancer cell apoptosis can impact the development of novel methods for cancer drug development and future research on the impact of kefir as alternative or adjunct therapy for colon cancer.

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