Lactococcus lactis postbiotics on human glioblastoma cell lines: _in vitro_ evaluation of antitumor activity.

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In recent years, probiotics have attracted increasing attention in the medical, pharmaceutical, and food fields due to their well-documented health benefits. This growing interest has driven scientific research toward the identification and characterization of novel probiotic strains. We established a collection of 50 lactic acid bacteria (LAB) isolated from dairy products, including *Lactococcus lactis* subsp. *lactis*, *Streptococcus thermophilus*, *Lactobacillus rhamnosus*, *Lactobacillus fermentum*, and *Lactobacillus helveticus*. Following a preliminary screening of probiotic-related properties, such as tolerance to acidic conditions and bile salts, antibiotic resistance profiles, cell surface hydrophobicity, autoaggregation ability, and production of antimicrobial compounds, the best-performing strains were selected for further investigation of their potential anticancer properties. In our study we focused on the potential antitumor activity of postbiotics (functional fermentation compounds) produced by three selected high-performing *Lactococcus lactis* subsp. *lactis* strains on human glioblastoma cell lines. Cell viability assays, including MTT and Trypan Blue exclusion tests, showed a significant reduction in cell proliferation following treatment. Flow cytometry analysis confirmed these findings, demonstrating cell cycle arrest in treated cells. Furthermore, postbiotic treatment significantly inhibited cancer-related processes such as wound healing and cell migration. On the other hand, primary astrocytes viability and the blood-brain barrier (BBB) integrity were not impaired, suggesting a selective effect of postbiotics on proliferating-undifferentiated cells. This preliminary study highlights, for the first time, the potential anticancer properties of postbiotics from some *L. lactis* strains on human glioblastoma cell lines.