

Targeting cellular signaling pathways in cancer by *Lactobacilli*

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Program Abstract

Purpose: Presenting *lactobacilli* therapy for cancer treatment targeting cancer signaling. *Lactobacilli* as Probiotic lactic acid bacteria (LAB) are a group of fermentative gram-positive and gram-negative bacteria that produces a large number of intracellular and extracellular metabolites used in the food manufacture industry as well as complementary and alternative medicines against many diseases including cancer. **Description:** Some LAB has been found to have inhibitory activity against colon liver cancer, cancer, colorectal cancer, breast cancer, and lung cancer *in vivo* or *in vitro*. These fermentative bacteria induced the autophagy cell death either by GRP78 and Beclin-1 or by induction of Bak and Bcl-2 as well as boosted the apoptosis induction ability of 5-fluorouracil (5-FU). They also participate in the downregulation of the gene product of nuclear factor-kappaB (NF- κ B), controlling the cell proliferation (Cox-2, cyclin D1) and survival (Bcl-2, Bcl-xL) which help to stop cancer. They are tested *in vitro/in-vivo* as whole live cells, fermentative broth, or purified molecules and found to associate with cellular signaling pathways such as the intrinsic mitochondrial pathway, Stat3/IL-6, NF- κ B signaling pathway that is involved in cancer. **Looking Ahead:** The pathways associated with metabolic activities of intestinal microflora, bile acid-metabolizing bacteria colon conditions, and enhancing the host's immune response. Thus, the anticancer therapeutic potential of bacteria *Lactobacillus acidophilus*, *L. reuteri*, *L. acidophilus*, and *L. rhamnosus*, *Bifidobacterium longum* and *L. acidophilus*, *Streptococcus thermophiles*, LTA-deficient *L. acidophilus*, *Pediococcus pentosaceus* FP3, *L. salivarius* FP25, *Enterococcus faecium* FP51 could be benefited for the cancer treatment either by use of themselves bacteria or their metabolites targeting cancer signaling.

Keywords: Probiotic, *Lactobacilli*, Signaling, Cancer Therapy