

INFLUENCE OF METABOLIC PRODUCTS OF *LACTOBACILLI* PROBIOTIC STRAINS ON CELL CYCLE OF EUKARYOTIC CELLS

Pits V.V.¹, Soloviov S.O.^{1,2}, Trokhimenko O.P.^{1,2}

¹ National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute";

² Shupyk National University of Healthcare of Ukraine

e-mail: vadimpitsofficial@gmail.com

The normal human intestinal microflora performs a number of important functions. One of the fundamental ones is the creation of colonization resistance, a kind of barrier on the mucous membrane of the digestive tract. With the emergence and development of dysbiotic disorders in the intestines, there is a decrease in colonization resistance, which leads to an increase in susceptibility to infectious diseases. The leading approach correct these disorders is the use of probiotics on the basis of bacterial strains - characteristic representatives of normal intestinal microflora, which have the ability to positively influence the human body, restoring and stabilizing the balanced composition of the microbiocenosis of the gastrointestinal tract. The purpose of the study was to clarify the influence of metabolites of probiotic strains of lactobacilli on the cell cycle of eukaryotic cells.

The following biological objects and reagents were used in the study: surface-dependent cell line Hep-2; exogenous metabolites of lactobacilli strain *Lactobacillus delbrueckii subsp. lactis*; tumor necrosis factor TNF- α . Cell cycle parameters were assessed in dynamics of cultivation using Annexin V-FITC and flow cytometry method.

Results showed that metabolites of lactobacilli do not affect the cell cycle parameters of cell culture. It was shown that, compared to the control culture, the number of proliferating cells under the effect of TNF- α decreased, and with the combined effect of TNF- α and the preparation of lactobacilli metabolites, the number of proliferating cells normalized regardless of the age of the culture. Metabolites stimulate the proliferative activity of young, mature and old cells, both individually and in combination with TNF- α . It was found that the number of cells in the late stage of apoptosis in a young cell culture was reduced under the influence of TNF- α or lactobacillus metabolites. At the same time, as the degree of culture maturity increased, the number of late-apoptotic cells increased, that is, apoptotic changes became irreversible. With the simultaneous effect of TNF- α and the preparation of metabolites of lactobacilli, the number of cells at the stage of irreversible apoptosis is significantly higher than the control indicators.

In general, it allowed to visualize the model of changes in the life cycle of epithelial cells when using preparations based on known probiotic strains of lactobacilli and can be used in further studies.