

PROSPECTS FOR THE USE EXOPOLYSACCHARIDES OF LACTIC ACID BACTERIA AS ANTIHERPETIC AGENTS

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Herbal medicines and purified natural products provide a rich resource for novel antiviral drug development. In recent years, more and more attention has been paid to the study of the biological activity of the exopolysaccharides (EPSs) especially the ones produced by some lactic acid bacteria (LAB). In particular, it was shown that they have immunostimulatory, antitumor and antioxidant activities. As the biological activity of the EPSs is strain-specific, the search for new producers among the LABs, which are the representatives of the natural microbiota of fermented products, remains relevant. The strains producing EPSs, especially in large amounts, are interesting from the point of view of their use both for improving the rheological properties of the product, and for the possible health effects. The aim of the study was to investigate the effect of EPSs produced by lactic acid bacteria on the structural and functional characteristics of BHK-21 cells and the development of herpes viral infection *in vitro*. Cytotoxicity of EPSs of lactic acid bacteria of the genera *Lactobacillus*, *Leuconostoc* and *Pediococcus* was determined by MTT-assay. The influence of the EPSs on the infectivity of herpes simplex virus type 1 (HSV-1) and on the cell cycle under a condition of herpetic infection was studied using plaque reduction assay and flow cytometric analysis, respectively. It was shown that, in non-toxic concentrations, all studied EPSs have anti-HSV-1 activity affecting various stages of the virus reproduction. The use of EPSs leads to the normalization of the life cycle of the cells infected with the herpes simplex virus to the level of uninfected cells. It was found that EPS 26a produced by *Lactobacillus* sp. possesses multiple antiviral effects as it showed virucidal activity, prevented adsorption, penetration of the virus into cells and the release of viruses, and reduced the infectious titer of herpes simplex virus by 97-99%. EPS 26a showed distinct anti-HSV-1 activity and the obtained data demonstrate the potential of using exopolysaccharides as anti-herpetic agents.

