ISOLATION FROM THE KAZAKH TRADITIONAL FOOD PRODUCTS OF A NEW STRAIN OF LACTIC ACID BACTERIA PRODUCING THE HUMAN PLASMINOGEN RECEPTOR

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Lactobacillus bacteria are one of the most important groups of the human intestinal microbiota that promote health. Adhesion to host tissues represents a crucial early step in the colonization process of either pathogens or commensal bacteria. Plasminogen - binding may also contribute to bacterial adhesiveness and invasiveness by nonproteolytic mechanisms. Plasminogen (Plg) binds to bacterial cell surface receptors, as well as to receptors on eukaryotic cells and may thus function as a bridge between the bacteria and the epithelium. The project aims to isolate a new strain of lactobacilli producing a protein-receptor for human plasminogen (Plg-R) from traditional Kazakh food products and to study the mechanism of reception. Lactic acid bacteria (LAB) strains isolated from traditional home-made food products and identified using 16S rRNA nucleotide sequence analysis; samples of extracellular proteins obtained from the cell-free supernatant (CFS) of the 24-hour culture after pH adjustment to 8.0 to dissociate acidic cell surface proteins, followed by concentration. Screening for Plg binding in CFS of LAB isolates carried out by Western Blotting assay. The Plg-R was purified from cell lysates after ultrasonic homogenization by Q-sepharose chromatography and the isoelectric point and subunit structure were determined by Mono P column chromatography and Sephadex G-75 gel filtration respectively. Screening of 35 isolates of LAB for Plg binding revealed a strain L. plantarum 30 isolated from homemade butter with maximal Plg-binding activity. The Plg-R band with comparatively high intensity migrated in the region of 47 K on the PAA gel with SDS and showed pI=4.8. The Plg binding was inhibited by adding an analog of lysine ε-aminocaproic acid (EACA). The Plg-R eluted in the exclusion volume in gel-filtration, which indicates the quaternary structure. A new strain from the homemade butter which produces the Plg-R was isolated. The inhibition by EACA of the Plg binding with receptor indicates the specificity of the binding which realized via lysine residues on the molecule of Plg-R. The properties of Plg-R are similar to the glycolytic moonlighting enzyme enolase and identification of the Plg-R in progress.