

NECESSITY OF STUDYING OF ADHESIVE PROPERTIES OF PROBIOTIC PREPARATIONS

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At the present stage of development of the pharmaceutical market of Ukraine there is a problem to create new, national, complex probiotic preparations. Particular attention should be paid to the methods of monitoring of the specific activity of finished dosage forms. In the section of Analytical Normative Documentation (AND) "Specific activity", in addition to the required parameter for probiotic "The number of viable cells in a single dose of the preparation" the other parameters are also given that determine the therapeutic effect of the finished dosage form of probiotic. The range of positive characteristics of probiotic microorganisms and their favorable effect on the microorganism is distributed each year and accordingly the number of control parameters in the unit of AND "Specific activity" is increased.

One of these properties is adhesive activity, which is determined by various methods: microbiological, light and electron microscopy, biophysical and mathematical. The method with using of human erythrocytes as universal model of cells is the most affordable. There is a glykoforyn on the surface of erythrocytes – a substance that is identical to the glycocalyx of epithelial cells, on which the receptors for adhesins of microorganisms are located. There are two methods – express test method and detailed method, each of them are intended for the solution of the specific tasks. Express method is used for a rapid and simultaneous determination of adhesive properties of a large number of microorganisms' strains. The detailed (test-tube) method is intended to determine the dependence of the adhesion process from the cells properties of micro- and macroorganism and other factors. The degree of adhesion is analyzed in the light microscope. Adhesive properties are evaluated by the average value of adhesion (AVA) – the average number of microorganisms attached to one erythrocyte by counting at least 25 erythrocytes considering no more than five red blood cells in one field of vision. Depending on the value of the index AVA the adhesiveness is considered zero adhesiveness (0-1.0), low adhesiveness (1.01-2.0), medium adhesiveness (2.01-4.0) or high adhesiveness (over 4.0).

Except AVA the adhesion of bacteria is evaluated according to the following parameters: coefficient of the microorganism cells in the adhesion process (C) – the percentage of red blood cells that have adhesive microorganisms on their surface, index of adhesiveness of microorganisms (IAM) – the average number of microbial cells on one erythrocyte involved in the adhesive process.

Adhesion of bacteria to human tissue surfaces is an important initial stage of infection, so the competition for the tissue receptors with pathogens could be the first probiotic effect. Adhesive strains play one of a key role in a probiotic therapy. Therefore it is necessary to determine adhesive properties of probiotic strains before developing of preparation on their base.