

## **STUDY OF THE STABILITY OF PROBIOTIC CROPS TO ANTIBIOTICS AND THE ACTION OF BILE**

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Disruption of the microbiota of the gastrointestinal tract is associated with many pathological conditions. Understanding the mechanisms of action of probiotic drugs and knowledge of the evidence base is important for gastroenterologists, therapists and general practitioners who support their use in practice.

Probiotics are living microorganisms and substances of microbial origin, which with the natural method of administration have positive effects on the physiological, biochemical and immune responses of the host organism through the stabilization and optimization of the functions of its normal microflora. So, the positive effects in the treatment of rheumatoid arthritis, some infections of genitourinary ways, pyoinflammatory complications in surgical practice, gynecological diseases of infectious nature and many others. Such diverse effects of probiotics is determined by the original mechanism of action. Soon after taking the drug begin to stand out of bioactive substance and function of the system of microbial cells, which could have a direct effect on pathogenic and conditionally pathogenic microorganisms and is mediated by the activation of specific and unspecific protection systems of the organism. In this same time period, bacterial cells of a probiotic, which can be considered as biocatalysts of many vital processes in the digestive tract, actively produce enzymes, amino acids, antibiotic substances and other physiologically active substances that complement the comprehensive medical and preventive action.

Depending on the time of creation and improvement there are several generations of probiotics:

- the first generation – classic monocomponent preparations, consisting of one strain of microorganisms – the typical inhabitants of the intestine;
- the second generation – smolinerwien antagonists;
- third generation – multi-component drugs consisting of several (2 to 30) of the strains of bacteria or multiple species of bacteria
- the fourth generation – a combination of drugs (synbiotics), consisting of strains of bacteria and ingredients that contribute to their growth, reproduction and metabolic activity
- the fifth generation multi-component combination therapies, consisting of several types of bacteria and ingredients that contribute to their growth, reproduction and metabolic activity.

Probiotics contain live cultures of bacteria that are characteristic of the gastrointestinal tract of a healthy person. These include, first of all, *Lactobacillus acidophilus* and *Bifidobacterium bifidum*. Probiotics positively influence the balance of microflora in the intestine, suppressing the growth of pathogenic microorganisms, participating in the process of cavitary digestion, stimulating antimicrobial immunity. However, it is established that the range of indications for the use of probiotics in clinical practice can be substantially expanded.

The aim of this work is to study antibiotic resistance and bile resistance of probiotic cultures.

To date, basic requirements have been formulated to select strains for medicines and to prove their effectiveness and safety in clinical trials: microorganisms included in the preparation must be alive; The content of microorganisms in the preparation should be approximately the same concentration throughout the shelf life, minimally vary in different batches of the drug; Microorganisms must be resistant to low acidity, organic and bile acids, antimicrobial toxins and enzymes produced by pathogenic microflora.

Such characteristics of strains as resistance in acid medium to bile salts obtained during in vitro studies should confirm the feasibility of further development of the probiotic preparation.

The sensitivity of probiotic strains to antibiotics

The sensitivity of the production probiotic strains to antibiotics is determined in accordance with the procedure "Determination of antimicrobial activity of antibiotics by the diffusion method in agar".

Studies on the evaluation of antibiotic susceptibility are subject to pure cultures of the tested microorganisms, belonging to a certain species is confirmed by pheno- and genotypic methods of investigation.

Determination of the resistance of the production probiotic strain to the action of bile

Production strains should be resistant to the action of gastric juice, bile, increased salt and alkali content when passing through the gastrointestinal tract to preserve the viability of the cultures that have become part of the probiotics. If these properties are not detected or reduced in the recommended strain, and the culture is characterized by the production of unique biologically active substances with a therapeutic effect, studies should be carried out for the selection of auxiliary substances or dosage form (for example, acid-fast capsules, tablets with protective coating, etc.) Maximum preservation of the viability of probiotic cultures.

To date, the department of biotechnology is conducting studies to determine the resistance of probiotic strains widely used in the production of probiotic drugs, antibiotics, and also to the action of bile.