

THE MICROORGANISMS ANTIBIOTIC RESISTANCE AND ITS MECHANISMS

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Introduction. The microorganisms antibiotic resistance phenomenon appearance is an actual worldwide problem, which has a negative influence on the human health and on the control over the majority of important diseases. This leads to the decrease of the causal infectious diseases treatment efficiency. The microorganisms capacity to endure great concentrations of antibiotic drugs is called the microorganisms resistance.

Aim. To study the bacterial antibiotics resistance mechanisms.

Results and discussion. The microorganisms antibiotic resistance mechanisms are complicated and diverse. They are preconditioned by a number of factors which include the drug active form transformation under bacterial fermentative activation and modification; the absolute deprivation of the cell wall permeability to the separate drug; the change of the bacterial cell genome as the result of spontaneous mutations.

The microorganisms resistance mechanisms are divided into natural and acquired. Mycoplasmas that do not have cell walls can serve as an example of the natural mechanism because they are susceptible to all drugs acting at this level. The acquired resistance is characterized by genetic bases, when the resistance to drugs is defined by resistance genes (r – genes) and conditions facilitating their proliferation in germ populations. The acquired resistance can arise as the result of the occurring mutational changes in the bacterial chromosome with the following mutant selection. The mutation process proceeds easily under the presence of the drug, it is exactly under these conditions when the mutants get advantage over all other cells of the population. The mutations can be occasional and multiple; the transposition of the R–plasmids. These plasmids code the cross – over resistance to certain families of antibiotics. β – lactamase coded by the TEM – 1 plasmid can serve as an example of this cross – over resistance; the carrying r – genes transposons transposition.

Conclusions. It is almost impossible to prevent the bacteria antibiotic resistance development but it is necessary to use these antimicrobial drugs so that they could not facilitate the resistance development and proliferation. That is why narrow antibacterial drugs spectrum must be taken, the drugs administration for preventative reasons must be prevented, the drug must be taken according to the indications only.