

The model of influence of the antimicrobial agents (MIC) on the bacteria.

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Important conclusions can be made on the bases of the experiments performed by us. In particular, it had shown that hundreds of phage particles that are adsorbed on bacterial cell membrane do not cause bacterial cell infection, because of bacteria "immune system" which protects microbe and do not allow phages to eject the viral DNA into bacterial cell. However, if the number of phages adsorbed on membrane surface increases then bacteria is no more able to reveal self-defense mechanisms against phage "attack" and becomes infected. Therefore, there are a minimum number of antimicrobial agents, include phages (so-called MIC – minimal inhibitory concentration) which must be existed in the environment around the bacteria for achieving bacterial infection. But if number of antimicrobial agents is less than MIC, then it can not affect bacteria lifecycle.

It is clear that the number of antimicrobial agents, which is necessary for achieving bacterial cell infection (MIC) should be depended on other physical, chemical, biological factors. The confirmation of this consideration is shown the influence of temperature on the process of formation of phage plaques. It is shown that at temperature conditions which are different from 37°C the number of formed phage plaques as well as the sizes of plaques is different.

Our study clearly demonstrates the need of biophysical approach to determine the mechanisms of interaction between bacteria and antimicrobial agents (cocktail) in order to effectively fight against bacterial infections.