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Influence of sub-bactericidal concentrations of antiseptics on DNA and phenotypic markers of virulence of microorganisms

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Local antiseptics in sub-bactericidal concentrations are active against antibiotic-resistant microorganisms, including Gram-negative bacteria. The studies were performed *in vitro* and *in vivo*, on the culture of fibroblast cells of human embryonic skin. Our study shows anti-adhesive activity of QATs against *S. aureus*, their ability to suppress hyaluronidase and *Staphylococcal* plasma coagulase. Poviargol (silver nanoclusters) is able to suppress protein A of *Staphylococcus*, prevents the formation of microbial biofilms on biotic and abiotic surfaces. Polyhexanide shows anti-adhesive properties against Gram-positive and Gram-negative bacteria, enhances the effect of antibiotics against resistant microbes due to increased permeability of the cell wall, affects plasma coagulase, collagenase. The effect of sodium hypochlorite on microbial DNA was assessed by UV spectroscopy and electrophoresis. For the first time, a dose-dependent effect of sodium hypochlorite on individual nucleotides and polynucleotides was obtained, and complete destruction of the plasmid DNA of *Escherichia coli* DH5-Alpha strain was demonstrated. It has been established that the interaction with sodium hypochlorite involves the destruction of the secondary structure of DNA (denaturation) and the chemical modification of nitrogenous bases, presumably chlorination. The presence of a secondary structure slows down the chemical reaction of sodium hypochlorite with nitrogenous DNA bases. The ability of sodium hypochlorite to destroy formed (48 hours) microbial biofilms of *Klebsiella pneumoniae* and *Pseudomonas aeruginosa* is studied. Various antiseptics in non-bactericide concentrations complexly affect the antibiotic-resistant microbial cell increases the permeability of the cell membrane, inhibit the enzyme-in activators of antibiotics and suppress the epidemic factors of the transfer of antibiotic resistance markers by transduction and conjugation.

Biography

Anna G Afinogenova is a Pharmacist, Microbiologist, Doctor of Biological Science, Specialized in Clinical Microbiology. She is the Head of laboratorial center of St. Petersburg Pasteur Institute and Professor of St. Petersburg State University. She has published more than 30 papers in journals and got 17 patents.

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