A significant increase of anti-H antibody titers in mice challenged with the virulent A/WSN/1/33(H1N1) strain and treated with Taurosid Sx1 was seen on the day 4, compare with the control group (128.0±19.6* and 80.0±15.1, correspondently). By the day 14 the difference was not significant. When vaccinated mice were given Taurosid Sx1, the rising of anti-H1 antibody titers was not significant on the day 4, but increased significantly 10 times to compare with the control group antibody titers by the day 14 (1280.0±286.2* and 120.0±25.3, correspondently). Oral administration of Taurosid Sx1 stimulated also production of antibody against IV type B hemagglutinin of DS on the day 4 (100.0±20.0* versus 40.0±0.0 in control). Use of the saponin did not influence significantly on the anti-H3 antibody production.

This study has shown that oral administration of 200 μg/mouse/day Taurosid Sx1 within 3 day after virulent IV challenge or GRIPPOL® vaccination selectively stimulates development of anibodies specific to IV type B hemagglutinin and anti-H1 anibodies generated by both virus infection and vaccination.

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ANTIBACTERIAL ACTIVITY OF SYNTHESIZED COMPOUNDS FROM DIFFERENT CLASSES OF CHEMICALS

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The main problem in bacteriology is a constant increase a number of antibiotic-resistant strains of bacteria. Therefore, the purpose of our work is the study of new developed chemicals.

We investigated the antibacterial effect of three groups of compounds derived from synthetic and natural substances: 2 groups are based on fluoroquinolonic acid (30 substances) and derivatives of 1.2,4-triazoles (25 substances). The third compound (CH-II) is synthesized from natural substances (there is a patent). It contains organic components: pyrogallol, glycerol, succinic acid, tannins, gallic acid, mannose, fructose, myo-inositol, glucose, ribitol and microelements and minerals includes about 60 names. As a model, we used reference strains of microorganisms and isolated in hospitals (with multiple resistance): *Esherichia coli*, *Klebsiella pneumonia, Pseudomonas aeruginosae, Staphylococcus aureus, Staphylococcus epidermidis, Enterococcus faecalis, Moraxella catarrhalis, Corynebacterium diphtheriae*. The sensitivity to preparations was studied by the method of the minimum inhibitory concentration (MIC) in accordance with the recommendations of EUCAST 8.0.

Several substances from the first group of compounds showed very good results with reference strains: MIC for all representatives of *Enterobacteriales* was less than 0.1 mg/l, for *Staphylococcus* spp. less than 0.5 mg/l, *E. faecalis* 2 mg/l, *M. catarrhalis* 0.1 mg/l, *C. diphtheriae* 1 mg/l. All reference and hospital strains were sensitive to this group.

Several substances from the second group of compounds also showed good results: MIC for different representatives of *Enterobacteriales* was different, but did not exceed 0.3 mg/l, for *Staphylococcus* spp. less than 0.5 mg/l, *E. faecalis* 4 mg/l, *M. catarrhalis* 0.2 mg/l, *C. diphtheriae* 2 mg/l. For all reference strains, the results were in the sensitivity zone. The best results among hospital strains were obtained on Grampositive bacteria: they were all sensitive.

The compound CH-II has good bactericidal properties. However, its MIC for all bacteria is slightly higher and is within the limits of intermediate values. This does not preclude the recognition of CH-II as an effective compound, since it is theoretically and practically (in toxicological researches) shown to be harmless when using the concentrations obtained.

Thus, the new groups of compounds obtained have a good antibacterial activity at MIC and can in the future take a worthy place among drugs with antibacterial action.

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DEVELOPMENT OF MAGNETICALLY CONTROLLED ANTIBACTERIAL COMPLEX EFFECTIVE AGAINST BIOFILMS

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The problem of effective therapeutic treatment of chronic and acute inflammation caused by the microbial biofilms development and vital activity is still actual today due to the resistance of bacteria to the most frequently antibiotic substances used in the medical practice. For recent years there are the most promising to use nanocomposite materials that can penetrate into the biofilms internal environment in a lightweight way. In particular magnetic particles in the composition of antibacterial agents can increase its effectiveness. Thus, the purpose of this work was to develop a new composite material with magnetically controlled properties and high antimicrobial activity.

As the main frame material was chosen amorphous calcium carbonate which entrapped ciprofloxacin. Composite matrix also consists of magnetite nanoparticles giving it magnetic properties. The active substance targeted release from nanocomposite occurs through calcium carbonate magnetoinductive recrystallization under the high frequency magnetic field action.

Experimental studies conducted on biofilms of two types of bacteria (gram-positive *Staphylococcus aureus* and gram-negative *Escherichia coli*) also proved a well-manifested composite based on calcium carbonate and magnetite antibacterial effect. The antibiotic in its initial form showed less effect on bacteria compared to the drug with immobilized antibiotic: the difference was 24–38% against *E. coli* and 50–76% against *S. aureus*. The antibacterial effect was also exerted by unentrapped nanocomposite particles without antibiotic which makes it possible to judge the possibility of providing a synergistic effect.

Thus, increasing the effectiveness of antibiotic substances on bacterial biofilms can be achieved (1) due to the nanocomposite magnetic targeting into which it is entrapped and its maximum localization in the inflammation focus, (2) due to the composite magnetic attraction into the biofilm and easier antibiotic penetration into biofilm because of its partial disintegration and (3) due to the synergistic effect in the form of biofilm local alkalization.

Further research is aimed at optimizing the method of obtaining an effective magnetically controlled drug and a comprehensive study of its impact on bacteria species biofilms the most important in medical practice as well as to assess its biocompatibility.

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