

The new nanotechnology preparing of complex phospholipids. Phages and antibiotic cocktails as a synergetics impact on bacteria. Biophysical studies of Microbial resistance and biofilms.

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Presented by us technology gives opportunity to prepare nanosized liposomes, where it may be incorporated as hydrophobic also hydrophilic molecules for suffer their biological activity when enter living organism. Such packing of molecules into phospholipid liposomes lead to increase possibilities to overcome the damaged organ cell membrane and penetrate into the cell cytoplasm. Therefore such nanoparticles are more effective for treatment diseases. Particularly, by this method we prepared liposomes using DPPC and DPPA lipids, inside of which we incorporated cholesterol, calcium ions and 24nm diameter gold nanoparticles. At the end we want to mention that the presented method is different from those which were used before for preparing complex vesicles. This technology is easy, fast and economic, therefore is cheap. The parameters of complex liposomes prepared by our methods are analogous with those liposomes prepared by previous methods. It needs half an hour to prepare complex liposomes using our method.

Turbidimeter experiments showed that the phages and antibiotics cocktail is more effective with inhibiting bacteria process, than separately for each antimicrobial agents (phages, antibiotics). With this we showed that there we have synergetic effect.

In addition, with our method were observed bacterial resistance ability, which is expressed in the fact, that we have made some manipulations we are witnessing a process of bacterial resistance. We have seen that during of the experiments the bacteria were resistant with other types of antibiotics as well.

Using microviscometer, creating in biophysical chair, we have seen the bacterial biofilms formation process in the continuous time regime. This method is a precedent for studying of biofilm generate process in the continuous time mode, which is very important to understand the formation of biofilms.