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Effect of new derivative of 2(5H)-furanone (F105) on biofilm formation by *Staphylococcus aureus*

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Nosocomial infections by methicillin-resistant *Staphylococcus aureus* (MRSA), an opportunistic biofilm-forming pathogen causing a variety of diseases including osteomyelitis, endocarditis, infections of indwelling devices and sepsis are still serious problem, because bacteria organized in biofilms become resistant to antibotic treatment and immune system of the host leading to difficult to treat and recurrent chronic infections.Here we show the effect of new derivative of 2(*5H*)-furanone (compound F105), synthesized in Kazan Federal University, on biofilms formed by MRSA strain. Biofilms were grown in Muller-Hinton broth and minimal inhibitory concentration (MIC), minimal biofilm inhibitory concentration (MBIC) and minimal biofilm eradication concentration (MBEC) of F105 were determined. MIC was identified by broth microdilution assay by cultivating of the MRSA in presence of the furanone F105 for 48 hours and was found to be 40 mg/l. The MBIC was studied by cultivating biofilms in eight-well slides. After 48 hours biofilms were analyzed by live/dead staining with Syto9 and propidium iodide on confocal microscope LSM 780 (Zeiss, Germany). At the concentration of 80 mg/l, F105 completely inhibited the biofilm formation, and the cell growth was suppressed by two orders of magnitude. Finally, the MBEC was defined to be also 80 mg/l. In summary, furanone F105 seems to be a promising compound in treatment of MRSA biofilms, and further studies on other Gram-positive biofilm-forming species are in preparation.