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Microbiological and Cytological Study of the 1, 3-Bis(Alkyl)-6-Methyluracils with 1, 2, 3–and 1, 2, 4-Triazolium Moieties Fragments

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Currently, the drugs used in chemotherapy do not have a desired effect, due to their low selectivity and bioavailability, as well as high toxicity, which causes many side effects.

It is known that compounds containing uracil fragment can exhibit biological activity through binding to different substrates. It is also found that the introduction of azole heterocycles leads to increased antimicrobial activity of compounds.

Previously it was shown thatthe derivatives of 1, 3-bis(alkyl)-6(5)-substituted uracil containing onium groups exhibit antimicrobial activity and low cytotoxicity in experiments on mammalian cells [1]. We have studied antimicrobial and anticancer activity, cytotoxicity and genotoxicity of new 1, 3-bis(alkyl)-6-methyluracil with 1, 2, 3- and 1, 2, 4-triazolium moieties.

The studied compounds have been tested for antimicrobial activity in relation to standard test strains of bacteria and fungi. Minimal Inhibitory Concentration of the leader compounds against Gram-positive bacteria is 0.4-4.0 mg/l and against Gram-negative bacteria - 8.0-31.3 mg/l. Antifungal activity of the investigated drugs in concentrations of 0.9-4.0 mg/l was shown.

Then the mechanism of DNA damaging effect in the SOS-lux test was investigated. The given compounds do not have genotoxic properties and showed no DNA-damaging effect.

The study of cytotoxic effect was carried out using the Cytell Cell Imaging system (GE Helthcare Life Science, Sweden). The compounds exhibiting high activity against tumor cell lines (MCF-7, A549, M-HeLa) and possessing low toxicity on normal human cell lines (WI-38 VA 13 subline 2RA, Chang liver) were identified.

The results of this work show that the investigated compounds can be considered as potential antimicrobial agents and used as key components for new drugs.

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Biography:

Dr. A S Sapunova is a research assistant in the International research and innovation center of neurochemistry and pharmacology of A.E. Arbuzov Institute of Organic and Physical Chemistry. In 2016 she has had started her PhD in the Microbiology laboratory, A.E. Arbuzov Institute of Organic and Physical Chemistry Subdivision of the Federal State Budgetary Institution of Science «Kazan Scientific Center of Russian Academy of Sciences», Kazan, Russia. Her main research topic is the development of new antimicrobial and anticancer drugs using new chemical compounds."