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Study on mutagenic activity of the lysine iodine adduct in human blood lymphocytes using *in vitro* chromosome aberration assay

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Before the discovery of antibiotics, infectious diseases were the leading cause of death. The discovery of antibiotics allowed to curb the ravages of numerous infections, but they still pose a serious danger. One of the ways to solve this issue is the search and development of new anti-infectious drugs with a wide spectrum of action. In our work, an iodine coordination compound consisting of potassium iodide, iodine and lysine hydrochloride was examined, which was registered in the Cambridge Crystallographic Data Centre Database under the number CCDC-1036668. This substance was shown to have high antibacterial activity. We have tested its mutagenic activity using the chromosome aberration assay. The series of experiments were carried out, as a result of which the optimal conditions for the analysis were selected: The incubation lasted 72 hours; the concentrations of the positive controls mitomycin C and cyclophosphamide were 0.2 and 5.0 μg/mL, respectively; type and time of exposure to the S9 exogenous activation system was 3 hours. Peripheral blood lymphocytes of a healthy female donor aged 25 years without recognized diseases and recent exposure to genotoxic agents were used. To study the mutagenic activity of the lysine iodine adduct, the following concentrations were used: 0.4; 0.2; 0.1 mg/mL. Lymphocytes were cultured together with the positive controls: Mitomycin C (without activation) and cyclophosphamide (with activation). The S9 fraction at a concentration of 1% was used as an exogenous activation system. The chromatid-type and chromosome aberrations were recorded. At least 100 metaphases were analyzed at each concentration. As a result, a statistically significant ($P<0.05$) increase in the frequency of occurrence of chromosome aberrations in the positive control cells was observed compared with the negative control. In the analysis of chromosome aberrations when processing lymphocytes with adduct at concentrations 0.4 to 0.1 mg/mL, there were no statistically significant increase in the frequency of occurence of chromosome aberrations, both in the analysis with metabolic activation and in its absence. Therefore, the lysine iodine adduct does not cause a mutagenic effect in human lymphocytes, both in the presence and in the absence of metabolic activation.

Biography

Sabina Murzageldinova has completed her Bachelor's degree from the Al-Farabi Kazakh National University, Chemistry Faculty, Department of Chemistry and Technology of Organic Substances, Natural Compounds and Polymers in 2011. Since 2013 she has been working as a Senior Laboratory Assistant in the Laboratory of Immunology at the Scientific Center for Anti-Infectious Drugs. She has published 5 research papers.

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