

их циркуляции в организме в течение необходимого времени и обеспечить безопасное выведение этих соединений из организма.

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В.П.И.: оригинальная идея и схема экспериментов, проведение экспериментов, анализ и интерпретация полученных данных, написание и редакция рукописи. О.В.Н. и Ю.И.З.: химический синтез поликатиона и его описание, подготовка рис. 1. Все авторы прочитали окончательную версию рукописи и согласились с ней.

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HEMOCOMPATIBILITY OF QUATERNIZED POLY-N, N-DIMETHYLAMINOETHYLMETHACRYLATE

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Objective: Quaternized polycations have been used not only as gene and drug delivery materials, but also as effective antimicrobial agents. Cationic copolymer of 2-dimethylaminoethylmethacrylate (DMAEM) with N, N-dimethyl-N-octyl-methacryloiloxyethylammonium iodide (DMOAEM) contains tertiary amino groups and quaternary ammonium groups. **The aim of the work** was to investigate the effect of the cationic DMAEM-DMOAEM copolymer on functions of human red blood cells (RBCs). **Methods:** We used the methods of polycation chemical synthesis, spectral methods, methods of flow cytometry and microscopic analysis. **Results:** It was found that the octylated polycation at low doses (0.1 and 1 µg/mL) did not change the lysis and aggregation of RBCs. Increasing polycation concentration (to 10 and 100 µg/mL) led to strengthening hemolysis and erythrocyte aggregation with the maximal hemolytic effect at the highest polymer dose (100 µg/mL). Adding cationic copolymer DMAEM-DMOAEM (from 0.1 to 100 µg/mL) into whole blood samples did not exhibit the toxic effect on human RBCs. We found that the treatment of human erythrocytes with bovine serum albumin (BSA) led to the total or partial inhibition of hemolytic effect induced by the polycation at the doses of 10 and 100 µg/mL. The BSA effect on the aggregation processes, induced by the polycation, depended on the used polycation concentration. BSA inhibited near-totally the aggregation of RBCs treated with the polycation at a dose of 10 µg/mL but did not compensate the aggregation effect induced by the polycation at a dose of 100 µg/mL. **Conclusions:** Quaternization of polycation molecules belongs to perspective instruments for transformation of characters in polymer compounds. Our experimental data have expanded the existing concepts concerning the structural-functional relationships of the cationic polymers.

Keywords: quaternized polycation, serum albumin, hemocompatibility, erythrocytes