

NEW METHOD OF SYNTHESIZING ALBUMIN NANOPARTICLES USED FOR TRANSPORT OF DRUGS

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Albumin is one of the well-studied and widely used in medicine biopolymers. In particular, albumin is often used to produce nanoparticles capable of transporting drugs to target organs. Albumin nanoparticles are usually synthesized by the method of desolvation with alcohol followed by stabilization with aldehydes [1]. The method for producing albumin nanoparticles (HSA and BSA) using L-Cysteine, which crosslinks protein macromolecules as a result of a disulfide exchange reaction, has been developed [2]. The use of this approach will allow exclusion of non-protein nature inclusions in the composition of albumin nanogels and thus reduce the toxicity of the polymer carrier. In this study, optimal conditions for obtaining albumin nanoparticles with satisfactory characteristics, namely nanoparticle size 156 ± 6.7 nm, polydispersity index 0.09-0.22, zeta potential -20 ± 5 mV, yield $70 \pm 6\%$ have been found. Using the methods of adsorption and incorporation, the antineoplastic drug hydroxyurea is immobilized into albumin nanoparticles. The method of incorporation is the most effective one, when the efficiency of binding reaches more than 80% and the release of hydroxyurea from the polymer matrix occurs prolonged. The methods of DLS, SEM, TG-DSC, FT-IR-Spectroscopy, and UV-spectrophotometer et al. have been used to study the physico-chemical characteristics and the nature of the interaction between the components of the system.

References

1. Weber C. Kreuter J., Langer K. Int. J. Pharm. 196: 197-200, 2000.
2. Lozinsky V.I., Okay O. Adv. Polym. Sci. 263: 49-101, 2014.