

Название публикации:

Polymer nanoparticles loaded with FeCl-tetraphenylporphyrin for binary catalytic therapy of neoplasms

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Аннотация:

In order to study the possibility of using a metal complex of the porphyrin series, (FeCl)-Cl-III-tetraphenylporphyrin (FeClTPP), and its polymeric form as antitumor agents for binary catalytic therapy, the technology of preparation of polymer particles containing FeClTPP was developed for the first time. The experimental data obtained allow one to conclude that the developed form using a copolymer of lactic and glycolic acids (ratio of monomer units 50: 50), ultrasonic homogenization, D-mannitol (as a cryoprotectant), the active agent to polymer ratio 1: 10, and the organic to aqueous phase ratio 1: 10 and 1:20, respectively, has the optimal physicochemical parameters. It was found that the free substance of FeClTPP and polymer particles with FeClTPP are active against MCF-7 (human breast adenocarcinoma), HeLa (human cervical carcinoma), and MG-63 (human osteosarcoma) cell lines. The polymer particles containing FeClTFP exhibit the highest cytotoxic effect against MCF-7 lines as compared to the free substance. The results of the study indicate that both the substance of tetraphenylporphyrin and its resulting polymeric form are promising for the treatment of tumor diseases in binary catalytic therapy.

Ключевые слова:

Binary catalytic therapy; reactive oxygen species; human tumor cells; metal-loporphyrins; (fecl)-Cl-III-tetraphenylporphyrin; polymer particles; copolymer of lactic and glycolic acids; biodegradation