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Magnetic Nanotherapy of Animals with Carcinoma Walker-256

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Magnetic nanoparticles (MNP) are of special interest due to their unique physicochemical properties and because of their using in medicine for magnetic fluid hyperthermia and magnetocytolysis of tumor [1]. The main practical problem with MNP is an inadequate nanoparticles supply to the tumour [2]. To overcome the above problems, we have developed a new technology of magnetic nanotherapeutics based on multiple modes of actions, such as mild hyperthermia less 40 C [3].

Based on theoretical considerations, that between the magnetic characteristics of MNC and its antitumor activity may be a connection, comparative studies of *the magnetic nanocomplex (MNC)* with different magnetic characteristics were carried out during the treatment of animals with carcinosarcoma Walker 256.

Our experiments have shown that antitumor activity of magnetic nanotherapy depends on MNC parameters. MNC consisted of nanoparticles Fe_3O_4 and antitumor drug doxorubicin. Tumor transplanted animals was subjected to irradiation of permanent magnetic and electromagnetic fields. The highest antitimor activity and survival rate of animals were observed after the treatment by MNC with larger magnetic moment of saturation, square of the hysteresis loop and lower coercivity. Intratumoral temperature does not exceed 38 ^{o}C. Obtained results can be used to treat cancer patients.

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