

Multielemental (boron, gadolinium) nanobiocomposites for multichannel theranostics

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A methodology is being developed for the synthesis of hybrid inorganic-organic nanobiocomposites, which are various multielement inorganic nanoparticles (with a complex of neutron-capturing, magnetic, photoactive, and other properties) encapsulated in biotargeted polymer macromolecules [1-6].

The nanobiocomposite with a complex of magnetic and potentially neutron-capturing properties was synthesized. This composite is gadolinium borate nanoparticles encapsulated in Siberian larch arabinogalactan macromolecules, that can pass through the blood-brain barrier.

Thus, the resulting nanocomposite is a promising tool for multichannel theranostics (contrast-enhanced magnetic resonance imaging, neutron-stimulated gamma-tomography, magnetic hyperthermia, dual boron, gadolinium neutron capture therapy), including brain tumors.

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