

ABSTRACT

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A review of recent advances in magnetic nanoparticle-based theranostics of glioblastoma.

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Rapid vascular growth, infiltrative cells and high tumor heterogeneity are some glioblastoma multiforme (GBM) characteristics, making it the most lethal form of brain cancer. Low efficacy of the conventional treatment modalities leads to rampant disease progression and a median survival of 15 months. Magnetic nanoparticles (MNPs), due to their unique physical features/inherent abilities, have emerged as a suitable theranostic platform for targeted GBM treatment. Thus, new strategies are being designed to enhance the efficiency of existing therapeutic techniques such as chemotherapy, radiotherapy, and so on, using MNPs. Herein, the limitations of the current therapeutic strategies, the role of MNPs in mitigating those inadequacies, recent advances in the MNP-based theranostics of GBM and possible future directions are discussed.

Plain Language Summary: Lay abstract Glioblastoma multiforme is the most aggressive and deadly form of brain cancer. Currently available treatment methods such as chemotherapy, surgery and radiotherapy are not often successful. This leads to fast disease progression and a maximum survival of 15 months. Magnetic nanoparticles, due to their unique features, could be a suitable tool for treating and diagnosing glioblastoma. This review article discusses their potential in this field.

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