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Nanotechnology advances in brain tumors: the state of the art.

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Abstract

Primary malignant central nervous system (CNS) tumors only represent about 2% of all cancers. However, they are very often associated with high morbidity and mortality. Despite current standard-of-care therapy, such as surgery, irradiation, and chemotherapy, neither cure nor any toxic therapy against malignant CNS tumors has been developed so far. Nanotechnology may alter this situation. It offers a new promise for cancer diagnosis and treatment. This emerging technology, by developing and manufacturing materials using atomic and molecular elements, can provide a platform for the combination of diagnostics, therapeutics and delivery to the tumor, with subsequent monitoring of the response. This review focuses on recent developments in cancer nanotechnology with particular attention to nanoparticle systems, important tools for the improvement of drug delivery in brain tumor. The latest advances in both the research sector and in recent patents for cancer imaging and therapy are discussed.

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