

ABSTRACT

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Research Progress on Nanoplatfoms and Nanotherapeutic Strategies in Treating Glioma.

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Glioma is the most common and aggressive primary intracranial tumor within the central nervous system. The blood-brain barrier (BBB) has been a great hurdle for an effective glioma treatment. To effectively treat glioma, various strategies have been applied to deliver drugs to the brain by crossing the BBB. Nanocarrier-mediated drug delivery is emerging as an effective and noninvasive system to treat glioma, showing great potential in glioma therapy. In this review, we will provide a comprehensive overview on nanocarrier-mediated drug delivery and related glioma therapy. Following an initial overview of the BBB and blood-brain-tumor barrier (BBTB) structure and characteristics, nanocarrier-mediated drug delivery strategies (liposomes, micelles, inorganic systems, polymeric nanoparticles, nanogel system, biomimetic nanoparticles, and exosomes) for crossing the BBB are discussed. Finally, nanotherapeutic techniques (imaging-mediated chemotherapy, photothermal therapy, photodynamic therapy, gene therapy, immunotherapy, ferroptosis therapy, sonodynamic therapy, chemodynamic therapy, and combination therapy) in treating glioma are summarized. In addition, this review provides some perspectives on the clinical applications of nanomedicines.

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