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Nanocarriers for the treatment of glioblastoma multiforme: A succinct review of conventional and repositioned drugs in the last decade

Mahitab Bayoumi ¹, John Youshia ², Mona G Arafa ^{1 3 4}, Maha Nasr ², Omaima A Sammour ²

Affiliations

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Abstract

Glioblastoma multiforme is a very combative and threatening type of cancer. The standard course of treatment involves excising the tumor surgically, then administering chemotherapy and radiation therapy. Because of the presence of the blood-brain barrier and the unique characteristics of the tumor microenvironment, chemotherapy is extremely difficult and has a high incidence of relapse. With their capacity to precisely target and transport therapeutic medications to the tumor while overcoming the challenges provided by invasive and infiltrative gliomas, nanocarriers offer a potentially beneficial treatment option for gliomas. Drug repositioning or, in other words, finding novel therapeutic uses for medications that have received approval for previous uses has also recently emerged to provide alternative treatments for many diseases, with glioblastoma being among them. In this article, our goal is to shed light on the pathogenesis of glioma and summarize the proposed treatment approaches in the last decade, highlighting how combining repositioned drugs and nanocarriers technology can reduce drug resistance and improve therapeutic efficacy in primary glioma.

Keywords: brain targeting; drug repositioning; glioma; nanocarriers.

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