Curr Med Chem. 2024 Nov 4. doi: 10.2174/0109298673344390241017065119.
Online ahead of print.

The Mechanism of Action of Exosomes Derived from Glioblastoma Cells

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PMID: 39501957 DOI: 10.2174/0109298673344390241017065119

Abstract

Glioblastoma (GBM) is a highly aggressive and lethal brain tumor characterized by rapid growth, invasive behavior, and resistance to conventional therapies, such as surgery, radiotherapy, and chemotherapy. Despite these interventions, patient survival remains poor due to the tumor's ability to recur and adapt to treatments. The function of GBM-derived exosomes (GBM-exosomes) as essential mediators in tumor growth has drawn attention in recent years. These small extracellular vesicles are involved in the transfer of a variety of molecules, including cytokines, miRNAs, proteins, and DNA, facilitating intercellular communication that promotes GBM cell proliferation, angiogenesis, immune evasion, and resistance to therapies. This review aims to provide an in- -depth examination of the mechanisms through which GBM-exosomes contribute to these pathological processes, as well as to discuss the current methodologies for isolating and characterizing GBM exosomes. Additionally, we explore the potential of exosomes as biomarkers for diagnosis and prognosis and as novel therapeutic targets in the fight against GBM. By improving our understanding of GBM-exosomes, we can pave the way for the development of more effective, personalized treatment strategies that may improve patient outcomes and quality of life.

Keywords: Glioblastoma; angiogenesis; cell proliferation; drug resistance; exosomes; immune evasion.