Current Understanding of the Exosomes and Their Associated Biomolecules in the Glioblastoma Biology, Clinical Treatment, and Diagnosis

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Abstract

Glioblastoma is the most common and aggressive brain tumor with a low survival rate. Due to its heterogeneous composition, high invasiveness, and frequent recurrence after surgery, treatment success has been limited. In addition, due to the brain's unique immune status and the suppressor tumor microenvironment (TME), glioblastoma treatment has faced more challenges. Exosomes play a critical role in cancer metastasis by regulating cell-cell interactions that promote tumor growth, angiogenesis, metastasis, treatment resistance, and immunological regulation in the tumor microenvironment. This review explores the pivotal role of exosomes in the development of glioblastoma, with a focus on their potential as non-invasive biomarkers for prognosis, early detection and real-time monitoring of disease progression. Notably, exosome-based drug delivery methods hold promise for overcoming the blood-brain barrier (BBB) and developing targeted therapies for glioblastoma. Despite challenges in clinical translation, the potential for personalized exosome = -054321`therapies and the capacity to enhance therapeutic responses in glioblastoma, present intriguing opportunities for improving patient outcomes. It seems that getting a good and current grasp of the role of exosomes in the fight against glioblastoma would properly serve the scientific community to further their understanding of the related potentials of these biological moieties.

Keywords: Diagnosis; Exosome; Glioblastoma; Glioma; MiRNA; Prognosis.

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