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Mesenchymal stem cells: a trojan horse to treat glioblastoma

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Abstract

Glioblastoma multiforme (GBM) is the most common and lethal primary tumor of the central nervous system. What makes it so dreadful is the very low survival rate, despite the existence of a standard treatment plan. An innovative and more effective way to treat glioblastoma based on Mesenchymal Stem Cells (MSCs) has been explored recently. MSCs are a group of endogenous multipotent stem cells that could mainly be harvested from adipose tissue, bone marrow, and umbilical cord. Having the ability to migrate toward the tumor using multiple types of binding receptors, they could be used either as a direct treatment (whether they are enhanced or not) or as a delivery vehicle carrying various anti-tumoral agents. Some of these agents are: chemotherapy drugs, prodrug activating therapy, oncolytic viruses, nanoparticles, human artificial chromosome... Promising results have started to surface; however, more evidence is needed to perfect their use as a glioblastoma multiforme treatment option. Alternative treatment, using unloaded or loaded MSCs, leading to a better outcome.

Keywords: Cancer treatment; Drug delivery vehicle; Glioblastoma multiforme; Mesenchymal stem cells; Migration.

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