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Glioblastoma therapy: State of the field and future prospects

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Abstract

Glioblastoma (GB) is a cancerous brain tumor that originates from glial cells and leads to thousands of deaths each year and a five-year survival of only 6.8 %. Treatments for GB include surgery, chemotherapy, radiation, and immunotherapy. GB is an incurable fatal disease, necessitating the development of innovative strategies to find a developing effective therapy. Genetic therapies may be crucial in treating GB by identifying the mutations and amplifications of multiple genes, which drive its proliferation and spread. Use of small interfering RNAs (siRNAs) provides a novel technology used to suppress the genes associated with disease, which forms a basis for targeted therapy in GB and its stem cell population, which are recognized for their ability to develop resistance to chemotherapy and tumorigenic capabilities. This review examines the use of siRNAs in GB, emphasizing their effectiveness in suppressing key oncogenes and signaling pathways associated with tumor development, invasion, stemness, and resistance to standard treatments. siRNA-based gene silencing is a promising approach for developing targeted therapeutics against GB and associated stem cell populations, potentially enhancing patient outcomes and survival rates in this devastating disease.

Keywords: Cancer stem cells; Glioblastoma; Small interfering RNA (siRNA).

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