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Targeted therapies for glioblastoma treatment

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Abstract

Glioblastoma, the most common and aggressive type of brain tumor in adults, poses significant challenges in terms of treatment. Conventional approaches including surgery, chemotherapy, and radiotherapy have yielded limited success, with a median survival of approximately 15 months. However, extensive research into the biology of glioblastoma has identified molecular targets that can be exploited by newly developed drugs, leading to the emergence of precise personalized therapies. Several innovative treatment strategies are currently under development, aiming to enhance effectiveness while minimizing side effects. Clinical trials are underway to evaluate the efficacy of monoclonal antibodies that target glioblastoma cells, either by blocking specific receptors or by modifying molecular interactions that impede cell proliferation. Another promising avenue involves the use of oncolytic viruses designed to selectively infect glioblastoma cells. Additionally, the review explores the utilization of nanocarriers capable of surmounting the formidable obstacle of the blood-brain barrier, enabling efficient drug delivery. Cell therapies represent another promising approach, with dendritic cells, chimeric antigen receptor-T cells, and macrophages emerging as potential treatment modalities. By summarizing recent advances in targeted therapies against glioblastoma, this review aims to provide a comprehensive overview of ongoing efforts to discover effective and safe methods for treating glioblastoma patients. The ultimate goal is to improve patient outcomes and transform the landscape of glioblastoma treatment.