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Hunting glioblastoma recurrence: glioma stem cells as retrospective targets

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Abstract

Glioblastoma (GBM) remains one of the most aggressive and treatment-resistant brain malignancies in adults. Standard approaches, including surgical resection followed by adjuvant radio- and chemotherapy with temozolomide, provide only transient control, as GBM frequently recurs due to its infiltrative nature and the presence of therapy-resistant subpopulations such as glioma stem cells (GSCs). GSCs, with their quiescent state and robust resistance mechanisms, evade conventional therapies, contributing significantly to relapse. Consequently, current treatment methods for GBM face significant limitations in effectively targeting GSCs. In this review, we emphasize the relationship between GBM recurrence and GSCs, discuss the current limitations; and provide future perspectives to overwhelm the challenges associated with targeting GSCs. Eliminating GSCs may suppress recurrence, achieve durable responses, and improve therapeutic outcomes for GBM patients.

Keywords: Glioblastoma; Glioma stem cells; Recurrence; Resistance; glioma cancer stem cells.

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