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Recent advancements and theranostics strategies in glioblastoma therapy

Sudhakar Baddam¹, Sudhakar Kalagara², Kuna Krishna³, Sreenivas Enaganti⁴

Affiliations PMID: 37582381 DOI: 10.1088/1748-605X/acf0ab

Abstract

Glioblastoma (GBM) is the most aggressive and lethal malignant brain tumour, and it is challenging to cure with surgery and treatment. The prevention of permanent brain damage and tumour invasion, which is the ultimate cause of recurrence, are major obstacles in GBM treatment. Besides, emerging treatment modalities and newer genetic findings are helping to understand and manage GBM in patients. Accordingly, researchers are focusing on advanced nanomaterials-based strategies for tackling the various problems associated with GBM. In this context, researchers explored novel strategies with various alternative treatment approaches such as early detection techniques and theranostics approaches. In this review, we have emphasized the recent advancement of GBM cellular models and their roles in designing GBM therapeutics. We have added a special emphasis on the novel genetic and drug target findings as well as strategies for early detection. Besides, we have discussed various theranostic approaches such as hyperthermia therapy, phototherapy and image-guided therapy. Approaches utilized for targeted drug delivery to the GBM were also discussed. This article also describes the recent in vivo, in vitro and ex vivo advances using innovative theranostic approaches.

Keywords: Cellular models; Glioblastoma; Phototherapy; Theranostics.

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