

## ABSTRACT

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Clinical utility of CAR T cell therapy in brain tumors: Lessons learned from the past, current evidence and the future stakes.

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The unprecedented clinical success of Chimeric Antigen Receptor (CAR) T cell therapy in hematological malignancies has led researchers to study its role in solid tumors. Although, its utility in solid tumors especially in neuroblastoma has begun to emerge, preclinical studies of its efficacy in other solid tumors like osteosarcomas or gliomas has caught the attention of oncologist to be tried in clinical trials. Malignant high-grade brain tumors like glioblastomas or midline gliomas in children represent some of the most difficult malignancies to be managed with conventionally available therapeutics, while relapsed gliomas continue to have the most dismal prognosis due to limited therapeutic options. Innovative therapies such as CAR T cells could give an additional leverage to the treating oncologists by potentially improving outcomes and ameliorating the toxicity of the currently available therapies. Moreover, CAR T cell therapy has the potential to be integrated into the therapeutic paradigm for aggressive gliomas in the near future. In this review we discuss the challenges in using CAR T cell therapy in brain tumors, enumerate the completed and ongoing clinical trials of different types of CAR T cell therapy for different brain tumors with special emphasis on glioblastoma and also discuss the future role of CAR T cells in Brain tumors.

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