The outstanding efficacy of chimeric antigen receptor (CAR)-modified T cells against hematological malignancies brings hope that they can be programmed to target solid tumors like malignant glioma (MG), the most common type of brain tumor. Preclinical models and early phase clinical studies demonstrate the feasibility of this approach for patients with MG. There are challenges such as the limited persistence of T cells, immunosuppressive tumor environment, antigen escape, and inefficiency of T cell trafficking to tumors after systemic delivery that need to be overcome for the successful translation of CAR T cell therapy into the clinic.