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The promise of immunotherapy for central nervous system tumours

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Abstract

The nervous and immune systems are intricately linked to one another through bi-directional crosstalk. Given the limited therapeutic options for aggressive and refractory central nervous system (CNS) tumours, immunotherapies are increasingly being explored as potential treatments for these malignancies. In this Review, we provide an overview of the nervous system-immune system connections that provide the basis for the use of immunotherapy to treat CNS tumours. We then summarize the outcomes from preclinical and clinical studies that have used immunotherapies, including chimeric antigen receptor T cell therapy, oncolytic viruses, cancer vaccines and immune-checkpoint inhibitors, for the treatment of primary CNS cancers such as high-grade gliomas, refractory embryonal brain tumours and primary CNS lymphomas. Finally, we review the neurological symptoms and syndromes that can arise with these immunotherapeutic approaches.

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