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Immunomodulatory signalling networks in glioblastoma multiforme: a comprehensive review of therapeutic approaches

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Abstract

Glioblastoma multiforme is a very aggressive type of cancer with high mortality and poor prognosis worldwide. Advanced treatment options with an understanding of the molecules and signalling mechanisms involved in this type of cancer have the potential to increase targeted therapy and decrease off-target effects, resistance, and recurrence. Glioblastoma multiforme (GBM) presents a complex tumour microenvironment with numerous cellular components and an extracellular matrix comprising multiple components. A deeper understanding of these components and corresponding signalling pathways can increase the success of immune checkpoint inhibitors in the treatment of GBM. The discovery of specific molecular changes and biomarkers has led to the investigation of tailored treatments for individual patients. Combination therapies targeting multiple pathways or utilizing different modalities are emerging as a promising strategy albeit with challenges in drug delivery to the brain. The review presents a comprehensive update of the various immunomodulatory signalling networks in GBM and highlights the corresponding therapeutic approaches by targeting them.

Keywords: Brain tumour; Cancer; Glioblastoma; Signalling; Therapy.

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