

## ABSTRACT

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The impediments of cancer stem cells and an exploration into the nanomedical solutions for glioblastoma.

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Glioblastoma is an aggressive and recurrent tumour that affects our brain and spinal cord with an extensively poor prognosis and death of the patient within 14-15 months of diagnosis. The tumour originates from astrocytes and therefore comes under the glioma known as astrocytoma. These tumours exhibit miscellaneous properties and contain cancer stem cells (CSCs). The stem cells exhibit diverse mechanisms through which these cells indulge in the proliferation and renewal of their systems. CSCs pose a significant obstacle as far as cancer therapy is concerned, which incorporates blocking important signalling pathways involved in CSCs' self-renewal and survival which may also include inhibition of the ATP-binding cassette transporters. Nanomedicine, biomarkers and drug delivery technology-based approaches using nanoparticles have tremendous ability to tackle the restrictions impending clinical applications, such as diagnosis and targeting of CSC-specific agents. Nanocarrier-based therapeutic agents have shown a potential of penetrating CSCs and increasing drug accumulation in CSCs. Nanomedicine can overcome ATP-driven pump-mediated multidrug resistance while also reducing the harmful effects on non-cancerous cells. The objective of this review is to examine advantages of nanomedicine and the innovative approaches that have been explored to address the challenges presented by CSCs in order to control the progression of glioblastomas by developing novel nanotherapeutic interventions which target CSCs.

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