Review Adv Drug Deliv Rev. 2023 May 4;114853. doi: 10.1016/j.addr.2023.114853.

Online ahead of print.

Long-Acting Therapeutic Delivery Systems for the Treatment of Gliomas

Smrithi Padmakumar [1], Mansoor M Amiji [2]

Affiliations

PMID: 37149040 DOI: 10.1016/j.addr.2023.114853

Abstract

Despite the emergence of cutting-edge therapeutic strategies and tremendous progress in research, a complete cure of glioma remains elusive. The heterogenous nature of tumor, immunosuppressive state and presence of blood brain barrier are few of the major obstacles in this regard. Long-acting depot formulations such as injectables and implantables are gaining attention for drug delivery to brain owing to their ease in administration and ability to elute drug locally for extended durations in a controlled manner with minimal toxicity. Hybrid matrices fabricated by incorporating nanoparticulates within such systems help to enhance pharmaceutical advantages. Utilization of long-acting depots as monotherapy or in conjunction with existing strategies rendered significant survival benefits in many preclinical studies and some clinical trials. The discovery of novel targets, immunotherapeutic strategies and alternative drug administration routes are now coupled with several long-acting systems with an ultimate aim to enhance patient survival and prevent glioma recurrences.

Keywords: CNS administration; Glioma; brain delivery; controlled drug delivery; implant; injectable; local chemotherapy; sustained release.