Review AAPS PharmSciTech. 2023 Apr 11;24(4):102. doi: 10.1208/s12249-023-02555-2.

# Lipid-Based Nanocarriers in the Treatment of Glioblastoma Multiforme (GBM): Challenges and Opportunities

Tanisha Gupta [1], Rakesh K Sahoo [1], Himani Singh [1], Sumeet Katke [2], Akash Chaurasiya [2], Umesh Gupta [3]

PMID: 37041350 DOI: 10.1208/s12249-023-02555-2

## Abstract

Glioblastoma multiforme (also known as glioblastoma; GBM) is one of the most malignant types of brain tumors that occurs in the CNS. Treatment strategies for glioblastoma are majorly comprised of surgical resection, radiotherapy, and chemotherapy along with combination therapy. Treatment of GBM is itself a tedious task but the involved barriers in GBM are one of the main impediments to move one step closer to the treatment of GBM. Basically, two of the barriers are of utmost importance in this regard, namely blood brain barrier (BBB) and blood brain tumor barrier (BBTB). This review will address different challenges and barriers in the treatment of GBM along with their etiology. The role and recent progress of lipid-based nanocarriers like liposomes, solid lipid nanocarriers (SLNs), nanostructured lipid carriers (NLCs), lipoplexes, and lipid hybrid carriers in the effective management of GBM will be discussed in detail.

**Keywords:** BBB; GBM; challenges; drug delivery; lipid nanocarriers; solid lipid nanoparticles.