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Exploiting potential of intranasal delivery of lipid nanoformulation for targeting glioblastoma

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Malignant gliomas are most devastating and deadly forms of tumors. Prolonged exposure of gliomas with high concentration of anti-cancer drugs is pre-requisite for therapeutic efficacy. But there are several limitations depending upon physiochemical characterization of the compound and impermeable nature of blood brain barrier (BBB) often results in sub-therapeutic drug concentration. Blood brain barrier is the major problem in drug delivery to the brain. In gliomas microvasculature exhibits physiological characteristics quite distinct from the intact cerebral structure. Second part of the review consist the use of non-invasive strategies to circumvent the BBB and deliver drug into the brain. Intranasal delivery route is the most suitable non-invasive route and it has the advantage of by passing the BBB and large number of compounds can reach the brain directly through various passages. Lipid-nanoformulations like liposomes and solid lipid nanoparticles have been largely exploited for brain targeting can be the most suitable carrier for gliomas. This review summarizes the introduction of glioblastoma, barriers to brain delivery, best carrier system for intranasal delivery and mechanism in drug transport to the brain for targeting glioblastoma.

Reference

Gendelman HE, Anantharam V, Bronich T, Ghaisas S, Jin H, Kanthasamy AG, et al.. Nanomedicine: Nanotechnology, Biology and Medicine. 2015;11(3):751-67.