

[Neisseria meningitidis](#) is known to specifically enrich the central nervous system through the guidance of an outer membrane invasion protein named [Opca](#). By loading chemotherapeutic drug [methotrexate](#) (MTX) in the hollow [manganese dioxide](#) (MnO₂) nanoparticles with surface modification of Opca protein of *Neisseria meningitidis*, a bionic nanotherapeutic system (MTX@MnO₂-Opca) is demonstrated to effectively overcome the BBB. The presence of Opca protein enables the drug to cross the BBB and penetrate into tumor tissues. After accumulating in [glioblastoma](#), the nanotherapeutic system catalyzes the decomposition of excess H₂O₂ in the tumor tissue and thereby generates O₂, which alleviates tumor hypoxia and enhances the effect of chemotherapy in the treatment of glioblastoma. This bionic nanotherapeutic system may exhibit great potential in the treatment of glioblastoma ¹⁾.

¹⁾

Dong CY, Huang QX, Cheng H, Zheng DW, Hong S, Yan Y, Niu MT, Xu JG, Zhang XZ. [Neisseria Meningitidis Opca Protein/MnO₂ Hybrid Nanoparticles for Overcoming Blood Brain Barrier to Treat Glioblastoma](#). Adv Mater. 2022 Jan 7:e2109213. doi: 10.1002/adma.202109213. Epub ahead of print. PMID: 34995395.

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