Neisseria Meningitidis Opca Protein

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 H2 O2 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.