TARGETING ORTHOTOPIC GLIOMA IN MICE WITH GENETICALLY ENGINEERED SALMONELLA TYPHIMURIUM

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OBJECTIVE: With the growing interests of bacteria as a targeting vector for cancer treatment, diverse genetically engineered Salmonella has been reported to be capable of targeting primary or metastatic tumor regions after intravenous injection into mouse tumor model. The purpose of this study was to investigate the capability of the genetically engineered Salmonella typhimurium to access the glioma xenograft, which was monitored in mouse brain tumor models using optical bioluminescence imaging technique.

METHODS: U87-MG malignant glioma cells (U87-MG) stably transfected with firefly luciferase (Fluc) were implanted into BALB/cAnN nude mice by stereotactic injection into the striatum. After tumor formation, attenuated Salmonella typhimurium expressing bacterial luciferase (Lux) was injected into the tail vein. Bioluminescence signals from transfected cells or bacteria were monitored using a cooled charge-coupled device (CCD) camera to identify the tumor location or to trace the bacterial migration. Immunofluorescence staining was also performed in frozen sections of mouse glioma xenograft.

RESULTS: The injected S. typhimurium exclusively localized in the glioma xenograft region of U87-MG-bearing mouse. Immunofluorescence staining also demonstrated the accumulation of Salmonella typhimurium in the brain tumors.

CONCLUSION: The present study demonstrated that Salmonella typhimurium can target glioma xenograft, and may provide a potentially therapeutic probe for glioma.