

Abstract

In this project, a safe and efficient liposome-based delivery carrier was developed, carrying a CD47 knockout plasmid that can suppress the advancement of GBM *ex vivo*. Two of the cationic lipids, DPPC and DOPE, and the polymer DSPE/PEG2000 were used to construct the shell of a lipofection vehicle. PEI-cholesterol was supplemented in one formulation to investigate the stability and safety of the system. To characterize the vehicles, DLS was used to determine the average diameter and the surface charge of liposomes, while TEM imaging was used to reveal the morphology of an individual vesicle. The performance of the gene editing *ex vivo* was quantitatively revealed by an enhanced level of GFP expression from flow cytometry. The cytotoxicity of the transfecting system was revealed by the result of the MTT assay. The ability to disrupt gene expression *ex vivo* in GBM will open new horizons for cancer treatment and research, as well as potential applications for targeted gene editing of noncancerous tissues.