1. No.

   2022Y012

2. Title

   Potential Usage of Nano DDS Drugs for the Treatment of Lymphatic Metastatic Lung Cancer

3. Period

   2022-2024

4. Summary

   To elucidate the impact of tumor lymphatic system on the delivery of long-blood-circulating liposomal drugs to lung tumor and their therapeutic effects on the lymphatic metastatic lung tumor, we originally prepared VEGF-C-expressed LL/2 cells (LLC-VC) and investigated the accumulation of fluorescently-labeled PEG-Lip (DiR-PEG-Lip) to LLC-VC solid tumor and the therapeutic effect of DOX-encapsulated PEG-Lip (PEGLipDOX) on the solid tumor-bearing mice. When lymphatic vessel formation in the LLC-VC solid tumor was confirmed by an immunostaining, LYVE-1-positive lymphatic vessels were widely observed in the tumor section. The results of fluorescence imaging of liposome distribution showed that DiR-PEG-Lip highly accumulated and widely distributed in LLC-VC solid tumor compared with LL/2 solid tumor after intravenous injection to the tumor-bearing mice. Furthermore, the treatment of LLC-VC tumor-bearing mice with PEGLipDOX significantly suppressed the tumor growth and showed highest tumor-suppressive effect. In addition, prolongation of survival time of PEG-LipDOX-treated LLC-VC tumor-bearing mice was observed. These data suggest existence of tumor lymphatic vessels affect the accumulation of PEG-Lip after systemic injection and PEG-LipDOX showed potent therapeutic effect on the VEGF-C-expressed lung tumor. Our findings in the present study demonstrated that liposomal anti-tumor drugs would be applicable to treat lymphatic metastatic lung tumors.