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Dual targeting of 83-14 monoclonal antibody- and anti-epithelial growth factor receptor-grafted solid lipid nanoparticles for glioblastoma multiforme therapy

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Solid lipid nanoparticles (SLNs) with surface 83-14 monoclonal antibody (8314MAb) and anti-epithelial growth factor receptor (AEGFR) were synthesized to permeate the blood–brain barrier (BBB) and treat glioblastoma multiforme. 8314MAb and AEGFR were crosslinked on SLNs for delivering antitumor etoposide (ETP) across human brain-microvascular endothelial cells (HBMECs) and inhibiting the growth of U87MG cells. An increase in the 8314MAb concentration increased the permeability for propidium iodide (PI) and ETP across the BBB, however, decreased the 8314MAb grafting efficiency and transendothelial electrical resistance of HBMEC monolayer. In addition, an increase in the AEGFR concentration enhanced the viability of HBMECs and human astrocytes (HAs), however, reduced the AEGFR grafting efficiency and ETP release rate. An incorporation of both 8314MAb and AEGFR increased the particle size, however, decreased the zeta potential, ETP release rate, and viability of HBMECs and HAs. The conjugation of 8314MAb and AEGFR on ETP-loaded SLNs can be a promising strategy to deliver ETP across the BBB and restrain the propagation of malignant brain tumor.

Biography

Chia-Hao Lee is now pursuing his in Department of Chemical Engineering National Chung Cheng University since 2014. His subject is nanotechnology for drugs delivery and designing the carrier of drugs such as solid lipid nanoparticles.

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