

Efficient self-assembled microRNA delivery system consisting of cholesterol-conjugated microRNA and pegylated polycationic polymer

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MicroRNA (miR), a key molecule of endogenous RNA interference (RNAi), is promising as a therapeutic agent to diseases. In vivo delivery of miR, however, is a major obstacle as its polyanionic nature and vulnerability to serum render it difficult to reach targeted lesion. To overcome these hurdles, we present a self-assembled miR delivery system consisting of cholesterol-conjugated miR (chol-miR) and pegylated polycationic polymer, poly ethylene glycol grafted poly ethylene imine (PEG-g-PEI). In our study, nanosized complexation of miR with PEI, suitable to effective protection and delivery of miR in vivo, was stably achieved by PEG grafting. Hydrophobicity of cholesterol conjugated to miR assisted structural solidity in PEG-g-PEI/chol-miR, avoiding undesirable loss of miR. Here we report preparation and analysis of PEG-g-PEI and self-assembled PEG-g-PEI/chol-miR complex with a model cell line, Hs746T (human metastatic gastric cell line). In conclusion, our miR delivery system with PEG-g-PEI/chol-miR showed considerable potential for the effective in vivo delivery of miR.