

Self assembled nanoparticles for photodynamic therapy

전윤옥^{1,2}, 남윤식¹, 김종호¹, 김광명¹, 정서영², 권익찬^{1,*}

¹한국과학기술연구원; ²경희대학교 약학과

(ikwon@kist.re.kr*)

Photodynamic therapy (PDT) involves two individual non-toxic components to induce selective photochemical destruction of tumor tissue by administration of the light of a specific wavelength that activates photosensitizing drugs. Hydrophobicity is the most distinct characteristic of porphyrin derivatives including protoporphyrin IX. This hydrophobicity leads the compound to poor solubility in aqueous condition which causes difficulties in parenteral administration. In order to overcome this problem, we conjugates glycol chitosan (GC) nanoparticles to protoporphyrin IX to improve its hydrophobicity. The photodynamic activity (photocytotoxicity) of these protoporphyrin conjugated GC nanoparticles was evaluated on B16F10 melanoma cells in comparison with the free drug; photocytotoxic efficiency is being evaluated by TUNEL and MTT. In terms of characterization properties, size of nanoparticles were measured, transmission electron microscopy image is also provided. The antitumor effect of GC-PPIX nanoparticle is improved by specific targeting using EPR effect which is one of distinct characteristics of tumor tissue and enhancing solubility of photosensitizer. Therefore, HGC nanoparticles have excellent potential carrier of PPIX and other photosensitizers.