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Core/Shell nanoparticles for targeted cancer therapy

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The formation of nanoparticles (NPs) with a core/shell structure was demonstrated through temperature-induced phase transitions in the melt state of a Pluronic/poly ethylene oxide (PEG)/paclitaxel (PTX) mixture. Liquid PEG (molecular weight: 400) was used as a PTX solubilizer, and the polymer that encapsulated the PTX was composed of Pluronic F-68. For the preparation of Pluronic NPs for docetaxel (DTX), a liquid soybean oil/Tween 80 mixture was used as the solubilizer instead of PEG in a temperature-induced phase transition. The Pluronic NPs delivering PTX or DTX showed an improved antitumor efficacy compared with a Cremophor EL-based PTX formulation and a Tween 80/ethanol-based DTX formulation (Taxotere®). NPs with multi-core structure has been designed based on the incorporation of NPs through the lipid bilayer membrane during the fusion process of vesicles and characterized as delivery vehicles for chemotherapy. The improvement on DTX-loaded Pluronic NPs was made using the fusion process of vesicles and the new type of DTX formulation was prepared in the aqueous media. We then evaluated the nanoparticle drug release, therapeutic efficacy, and *in vivo* biodistribution for tumor targeting using a non-invasive live animal imaging technology. Finally, the antitumor efficacy of NPs with various core/shell structure was evaluated by measuring changes of tumor volumes in tumor-bearing mice.

Biography

Soon Hong Yuk has completed his PhD at the age of 26 years from Korea Advanced Institute of Science and Technology (KAIST) in 1987 and Postdoctoral studies from University of Utah Department of Pharmaceutics and Pharmaceutical Chemistry in 1989. He is currently a Professor in College of Pharmacy at Korea University. He has published more than 110 papers in reputed journals. His current research interests are nanotechnology-based drug delivery system for cheomotherapeutic drugs and protein drugs.

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