

12th Nanotechnology Products and Summit

November 24-25, 2016 Melbourne, Australia

Development and characterization of lecithin stabilized micellar drug delivery system for improving efficacy and safety of chemotherapy

Chia-Yu Su

Taipei Medical University, Taiwan (ROC)

Traditional micelles composed of amphiphilic molecules caused low drug loading and less drug stability. To improve the limitation, additionally lipid shell as stabilized to encapsulate micelle can improve high drug leakage and instability resulted from the drug only entrapped in the matrix of amphiphilic polymer. In this study, it was attempted to develop a Lecithin Stabilized Micellar drug delivery system (LSM) for enhancing therapeutic efficacy and minimizing systemic toxicity of Docetaxel (DTX). A novel Lecithin Stabilized Micellar Docetaxel (LSMD) was prepared by firstly forming a thin film of self assembling micelles containing DTX and subsequently hydrated with lecithin nanosuspension. The physical characteristics of optimized LSMD were mean size <200 nm; encapsulation efficiency >90%; drug loading >5%; stability after reconstitution at RT and 4oC was >8 hrs and >48 hrs, respectively. The drug release profiles shows that DTX released from LSMD was slower than that of Tynen (DTX solvent-based formulation) in PBS buffer containing 0.5% Tween 80. LSMD further shows better cytotoxicity than Tynen for CT26 in cell viability assay. The immunofluorescence staining assay indicated that the alpha-tubulin in DU145 treated with LSMD obviously was polymerized and the nucleus was fragmented. The *in vivo* antitumor efficacy demonstrated LSMD are more efficacious than Tynen. *In vivo* study, treatment with LSMD leads to high drug accumulation in tumor and maximal tolerance dose was two folds higher than Tynen. In conclusion, Lecithin Stabilized Micellar (LSM) drug delivery systems could be a potential carrier for delivering hydrophobic chemotherapeutic agent that could enhance the efficacy of cancer chemotherapy and reduced toxicity.

Biography

Chia-Yu Su received MS degree in Pharmacy from Taipei Medical University in 2012. Currently, she is a PhD student of Taipei Medical University of Pharmacy. She has published three papers in Nanomedicine related journals.

alice5230419@hotmail.com

Notes: