[PE3-1] [10/18/2002 (Fri) 13:30 - 16:30 / Hall C]

Effect of Polyethylenimine Type in Polylactic acid Nanoparticles/DNA Complex on the Transfection Efficiency

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Nanoparticles of polylactic acid (PLA) and polyethylenimine (PEI) as an effective gene delivery agent were prepared and characterized. As a model plamid DNA, PME185/β-gal, a mammalian expression vector, and fluorescence enhancing protein (pEGHP) were used. The effects of PEI type on the physical properties of nanoparticles and transfection efficiency were examined.
Nanoparticles prepared by a solvent evaporation method were shown as a discrete and spherical shape having an average diameter of about 250 nm. The PLA/PEI-25000 and PLA/PEI-750000 nanoparticles showed the positive zeta-potential value, while PLA and PLA/PEI-800 nanoparticles showed the negative value. Complex formation between nanoparticles and plasmid DNA was analyzed by gel electrophoresis. Transfaction efficiency was measured by the detection of β-gal activity and fluorescence image. Complex of PLA/PEI-25000 with DNA showed greater transfection efficiency than PLA/PEI-800 or PLA/PEI-75000 complex.

[PE3-2] [10/18/2002 (Fri) 13:30 - 16:30 / Hall C]

Thermo-sensitive lipid nanoparticles as a novel topical delivery system of retinol

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The purpose of this study was to prepare thermo-sensitive solid-lipid nanoparticles (SLNs) with a lipid melted at human body temperature and to evaluate physicochemical properties of SLNs containing retinol, anti-wrinkle agent, as a model drug. SLNs were prepared using a high pressure homogenizing method. The SLNs were composed of retinol as a model drug, thermo-sensitive lipid (DS-CBS) as a lipid core, and egg phosphatidylcholine and Tween 80 as surfactants. Manufacturing variables such as homogenization pressure, homogenization cycles and cooling temperature were optimized. The thermo-sensitivity of SLNs was evaluated by using a VP-DSC Micro Calorimeter. Drug encapsulation efficacy, particle size distribution and zeta potential were determined after preparation. The chemical stability of retinol incorporated in SLNs was evaluated by HPLC determination. The physical stability was evaluated by monitoring the changes in the mean size and zeta potential of SLNs. To confirm the thermo-sensitivity, the release of retinol from SLNs was compared at 4℃ and 37℃, respectively. By optimizing the manufacturing variables, retinol could be incorporated in SLNs at the concenration of 10 mg/ml. The mean particle size was 229 nm and zeta potential was -14.56 mV. The chemical stability of retinol could be significantly improved by SLNs formulation. The transition melting peak of retinol-loaded SLNs appeared at 33.6℃, close to human body temperature. The release of retinol from SLNs was minimal at 4℃, but greatly enhanced at 37℃, suggesting the thermo-sensitivity of SLNs. These results suggest that the use of thermo-sensitive SLNs could be potential for the topical delivery of retinol.

PE3-3] [10/18/2002 (Fri) 13:30 - 16:30 / Hall C]

In vitro and in vivo transfection efficiency of a cationic lipid containing sodium cholate

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Cationic lipids have been used as one of the major components for making most promising non-viral gene delivery systems, whereas sodium cholate, an edge activator has been used as a surfactant in making ultradeformable and ultraflexible liposomes called Transfersomes. Using both a cationic lipid, DOTAP and sodium