

Ceramide-PLGA Nanoparticle Formation to Apply to Atopic Dermatitis

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Abstract : Ceramide, a component of stratum corneum at epidermis, helps to construct a rigid and dense skin barrier to prevent pathogens that cause atopic dermatitis. However, ceramide was too hydrophobic to be directly absorbed into stratum corneum and has risks of side effects by excessive treatment. To overcome the obstacles, ceramide was embedded into PLGA nanoparticles coated with chitosan. PLGA and chitosan have been known as biocompatible materials. PLGA was squeezed when faced with water and pumped ceramide out of PLGA nanoparticle. In addition, the chitosan coating layer helped initial adherence of nanoparticles to skin and regulate ceramide release until removed. This coating was degraded at weakly acid state like skin surface, finally ceramide release could be controlled. Finally, the nanoparticle was demonstrated to be non-cytotoxic and regenerate stratum corneum of atopic dermatitis model. Overall the nanoparticle is suggested as a novel and effective nanodrug to apply atopic dermatitis.

Keywords : nanoparticle, controlled release, atopic dermatitis, chitosan coating, ceramide

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