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Enhancement of the ocular bioavailability of cyclosporine A by cationic polymeric nanoparticles

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Abstract

Cyclosporine A (CsA) is a powerful immunosuppressive active agent which is widely used for the prevention of graft rejections after organ transplantations and for certain autoimmune disorders. Due to its cyclic structure and lipophilic character, it is practically insoluble in aqueous media and has very poor ocular penetration which limits the use of CsA after corneal transplantations. Researchers mostly focused on two major routes in ocular applications for the enhancement of ocular bioavailability; enhancement of the corneal contact time and enhancement of the corneal penetration with penetration enhancers. In this study, we focused on the first attempt and incorporation of CsA into cationic nanoparticles was planned with an attempt to enhance the ocular bioavailability of CsA with increased corneal contact time of the nanoparticles with the help of cationic character of the polymeric structure. Due to the excellent biocompatibility, non-toxic and self cationic character, Chitosan (molecular weight with 20-200cps) was selected as a carrier system in this study. Spray drying method was used to prepare nanoparticles and the physicochemical properties of the particles were analyzed in detail. *In vitro* release studies were carried out in simulated tear fluid at 32°C }1°C (pH: 7.4). Toxicity of the formulations prepared were also analyzed with colorimetric MTT method using healty mammalian fibroblast cells (3T3 rat fibroblast cells).

Biography

Ebru Basaran has completed her Ph.D. about “Ocular Application of Cyclosporine A Using Solid Lipid Nanoparticles” at 2007. She is working as an Asst. Prof. at the Anadolu University Faculty of Pharmacy Department of Pharmaceutical Technology since 2007. She has attended over 11 international meetings as an oral presenter about “Ocular applications of nano-microparticles”. She was awarded by NAGAI Foundation as the “Best Research Work” of FAPA meeting at 2008. She has 6 scientific publications.