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TITLE

Nanoliposomes for Ocular Delivery of Ciprofloxacin: in-vitro and in-vivo Evaluations

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Nanoliposomes were formulated aiming to enhance ocular bioavailability of ciprofloxacin (CPX). Nanoliposomes were successfully prepared using REV technique. Effects of liposomal phospholipid, cholesterol (CH) and charge on particle size, entrapment efficiency (EE%), stability and in vitro CPX release were investigated. DPPC liposomes gave the smallest particles while, DMPC was the largest. A correlation between EE% and chain length of phospholipid was observed. CH improved liposomal physical stability, increased the particle size and decreased EE%. Positive chargers including Stearylamine (SA) and dimethyldioctadecylammonium bromide (DODAB) produced larger particles with lower EE% compared with neutral liposomes. Stability were studied at 4oC, 25oC, 37oC and 34oC (eye-surface temperature) for up to 3 weeks. CPX liposomal were less stable at higher temperature due to the effect on gel to liquid transition of lipid bilayers together with degradation of phospholipids. PC form the most stable liposomes compared with DMPC and DPPC. Stability was observed with increasing CH content. The in-vitro CPX release in simulated tears at 34oC was dependent on type of phospholipoid and CH contents. Slowest release was observed for PC and DPPC liposomes with high CH content. The presence of charging agent showed to increase rate of CPX release. Liposomal of formulae PC:CH:DODAB and DPPC:CH:DODAB (7:1:2) and PC:CH(1:0) were selected for in-vivo study in rabbit eyes aqueous humor. The studies showed statistical significant differences between values of Cmax, T 1/2 and AUC0-∞, rate of absorption and MRT for liposomal formulations compared with a commercial CPX eye drops in favor of nanoliposomes.

Biography

Professor Bayomi received his Ph.D from the University of Connecticut, USA. He is now a professor of pharmaceutics at King Saud University, Saudi Arabia. He published many articles in reputed journals concerning microparticles, nanoparticles, liposomal formulations, drug targeting, and in-vivo evaluation of dosage forms. Dr. Bayomi was involved in different research projects funded by the college of pharmacy research center and King Abdul Aziz City of Science and Technology. He is currently involved in projects supported by the Center of Excellence in Biotechnology Research at King Saud University and serving as an advisory board member of Saudi Pharmaceutical Journal.