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Ciprofloxacin loaded nano-spanlastics for ototopical non-invasive delivery to the middle ear

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Ciprofloxacin is a broad spectrum fluoroquinolone antibiotic that has been used for systemic treatment of otitis media in adults. In addition, ciprofloxacin was approved for topical treatment of otorrhea in children with tympanostomy tubes. The aim of this work was to enhance the local non-invasive delivery of ciprolfolxacin across an intact tympanic membrane (TM) to the middle ear in an attempt to treat otitis media ototopically. In order to achieve this goal, ciprofloxacin nanovesicles, spanlastics, were prepared by thin film hydration technique (TFH) using several edge activators (EAs) at Span 60: EA weight ratio of 8:2. A full factorial design (3^2) was employed to optimize formulation variables including; type of EA and Span 60: EA weight ratio using Design-Expert® software. The optimal formulation was then subjected to physical stability studies and *ex-vivo* permeation studies (through ear skin and TM of rabbits). Results revealed that the optimal formulation (composed of Span 60 and Brij 35 as an EA at a weight ratio of 8:2) exhibited enhanced *ex-vivo* drug flux through ear skin and TM when compared with the commercial product (Ciprocin® drops). It also exhibited good physical stability after storage in refrigerator (4-8°C) for 6 months, as the physical properties of this formulation (appearance, drug content, entrapment efficiency, particle size, polydispersity index, and zeta potential) did not significantly change after storage in the specified conditions. Consequently, spanlastics could be promising nano-carriers for the non-invasive trans-tympanic delivery of ciprofloxacin.

Biography

Abdulaziz Mohsen Al-mahallawi has completed his Master's in 2012 from Faculty of Pharmacy, Cairo University, Egypt. He is working with pharmaceutics and industrial pharmacy as a Faculty of Pharmacy, Cairo University. He is a member in the drug manufacture unit (DMU) in the Faculty of Pharmacy, Cairo University. He has published 7 papers in reputed journals.

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