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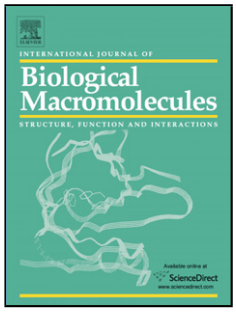

Title: Slow release of ciprofloxacin from β- cyclodextrin containing drug delivery system through network formation and supramolecular interactions

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Slow release of ciprofloxacin from β- cyclodextrin containing drug delivery system through network formation and supramolecular interactions

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Highlights:

- Swelling showed site specific nature of drug delivery systems
- β- cyclodextrin has improved release profile through network formation and supramolecular interactions
- Release of drugs occurred through non-Fickian diffusion mechanism
- Release profile best fitted in Korsmeyer-Peppas model
- The hydrogels were haemocompatible, mucoadhesive, and antioxidant in nature

Abstract

Supramolecular cyclodextrin (CD) hydrogels have occupied an important position in developing the materials for biomedical application. In the present work an attempt has been made to improve the release profile of ciprofloxacin by designing the β- cyclodextrin containing drug delivery system through network formation and supramolecular interactions. The polymer network has been formed by sterculia gum comprising of glucuronic acid and galacturonic acid and carbopol. The polymers have been characterization by cryo-SEMs, FTIR and ^{13}C solid state (NMR) and swelling studies. This article also discusses drug release, blood compatibility, mucoadhesion, gel strength and antioxidant properties of the polymers. The release of drug from β-CD containing hydrogels was slower and less as compared to the hydrogels without β-CD. Release of drugs from drug loaded hydrogels occurred through non-Fickian diffusion mechanism and release profile best fitted in Korsmeyer-Peppas model. These hydrogels have been found as haemocompatible, mucoadhesive, and antioxidant in nature. Mucoadhesive nature can further provide the site specific nature to drug delivery system in GIT.

Key words: β- cyclodextrin; drug release; ciprofloxacin; network formation; and supramolecular interactions.