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Design of cellulose ether-based macromolecular prodrugs of ciprofloxacin for extended release and enhanced bioavailability

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ABSTRACT

The present study reveals the syntheses of hydroxypropylcellulose- (HPC) and hydroxyethylcellulose- (HEC) based macromolecular prodrugs (MPDs) of ciprofloxacin (CIP) using homogeneous reaction methodology. Covalently loaded drug content (DC) of each prodrug was quantified using UV-Vis spectrophotometry to determine degree of substitution (DS). HPC-ciprofloxacin (HPC-CIP) conjugates showed DS of CIP in the range 0.87-1.15 whereas HEC-ciprofloxacin (HEC-CIP) conjugates showed DS range 0.51-0.75. Transmission electron microscopy revealed that HPC-CIP conjugate **2** and HEC-CIP conjugate **6** self-assembled into nanoparticles of 150-300 and 180-250 nm, respectively. Size exclusion chromatography revealed HPC-CIP conjugate **2** and HEC-CIP conjugate **6** as monodisperse systems. *In vitro* drug release