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Pharmaceutical Significance and Biomedical Application of Cellulose

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The amalgamation of polymer and pharmaceutical sciences led to the introduction of polymer in the design and development of drug delivery systems. Polymeric delivery systems are mainly intended to achieve controlled or sustained drug delivery. Polysaccharides fabricated into hydrophilic matrices remain popular biomaterials for controlled-release dosage forms and the most abundant naturally occurring biopolymer is cellulose; so hydroxypropylmethyl cellulose, hydroxypropylcellulose, microcrystalline cellulose and hydroxyethyl cellulose can be used for production of time controlled delivery systems. Additionally microcrystalline cellulose, sodium carboxymethyl cellulose, hydroxypropylmethyl cellulose, hydroxyethyl cellulose as well as hydroxypropyl cellulose are used to coat tablets. Cellulose acetate phthalate and hydroxymethyl cellulose phthalate are also used for enteric coating of tablets. Targeting of drugs to the colon following oral administration has also been accomplished by using polysaccharides such as hydroxypropylmethyl cellulose and hydroxypropylcellulose in hydrated form; also they act as binders that swell when hydrated by gastric media and delay absorption. This review paper assembles the current knowledge on the structure and chemistry of cellulose, and in the development of innovative cellulose esters and ethers for pharmaceuticals.