

Preparation and evaluation of electrospun indomethacin loaded Eudragit® S100 and Eudragit® RS100 nanofibers for colon-targeted drug delivery

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Background and Aims: Electrospinning is an interesting technique for making ultrafine fibers, which could be used as drug delivery vehicles. Since electrospun fibers normally have diameters ranging from sub-micrometers down to nanometers, their surface area to volume or mass ratio is very large. controlled release of drugs from electrospun fibers has been of increasing interests in recent years and the release characteristics should depend on interactions between polymer and drug pairs as much as on the sizes of the fibers.

The purpose of this study was to survey the influence of two factor (ratio of Eudragit S100 (ES): Eudragit RS100 (ERS)) and (ratio of drug:polymer) on the fiber formation and drug release from nanofibers for colon delivery. this study was to evaluate the combination of pH –dependent and time- dependent polymers as a single coating for design of colon delivery system of indomethacin electrospun .ES were used as pH-dependent polymer and ERS was used as time-dependent polymer.

A 32 full factorial design was used for optimization procedure. ES and ERS nanofibers loaded with indomethacin (with ethanol as solvent) were prepared using an electrospinning process and investigated for structural and release properties. Dissolution tests were carried out in phosphate buffer media with pH 1.2 (similar stomach PH), 6.4, 6.8 (similar small intestine PH) and 7.4 (simillar colon PH). SEM, DSC and FTIR analysis were achieved on nanofibers.

Burst drug release was occurred with formulation containing ES:ERS (1:4) while increase in ratio of ERS lowered this effect. Formulations with the lower drug content formed minor beads and exhibited slow release. Drug-loaded ES and ERS nanofibers had pH and time-dependent drug release profile, with limited release at pH=1.2, but sustained and complete release at pH=7.4.

The results indicated that drug-loaded ES and ERS nanofibers have the potential to be developed as oral-targeted drug delivery systems.

Keywords: Electrospinning; Nanofiber; Eudragit; Colon delivery