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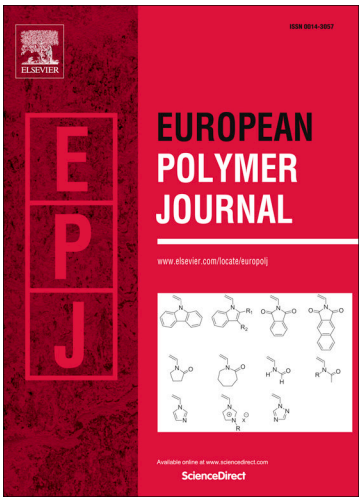

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Preparation and characterization of electrospun alginate nanofibers loaded with ciprofloxacin hydrochloride

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ABSTRACT

Alginate nanofibers were prepared in the presence of poly(ethylene oxide) (PEO), a surfactant Pluronic F-127, and a model drug (ciprofloxacin hydrochloride, CpHCl), all mixed prior to electrospinning. It was demonstrated that addition of a carrier polymer (PEO) and a small amount of surfactant are necessary to obtain uniform alginate fibers with cylindrical shape and regular morphology. Importantly, PEO was completely removed from the resulting nanofibers during crosslinking and stabilization post-treatment. The stable alginate fibers loaded with CpHCl were examined by scanning electron microscopy and the average diameter of the fibers ranged from 109 nm (unloaded fibers) to 161 nm (loaded fibers). The release of a studied antibiotic from the nanofibers, characterized by a final loading efficiency of 51%, was tested in physiological conditions. It was revealed that *ca.* 24% of CpHCl is released during first 20h with combined transport mechanism, however with the predominant contribution of Fickian diffusion.

Keywords: nanofibers; alginate; ciprofloxacin hydrochloride; drug release