Ciprofloxacin-Ibuprofen codrug: Synthesis, solubility, lipophilicity and antibacterial activity

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Abstract :

Ciprofloxacin is a second generation and broad spectrum floroquinolone antibiotic that acts by inhibition of topoisomerase type II (DNA gyrase). It is a class four biopharmaceutics classification system; it has solid-state limited solubility and low intestinal permeability. Improving the pharmacokinetic properties and synthesizing a co-drug have dual and synergistic action were the goals of this project through the synthesis of ciprofloxacin with Ibuprofen through simple esterification reactions. The molecular structures were confirmed by nuclear magnetic resonance (NMR) spectra. Shake-flask method was used to measure the aqueous solubility in a slightly alkaline phosphate buffer. Also antibacterial activity was studied against Staphylococcus aureus, Escherichia coli and Pseudomonas aerogenosa using Muller Hinton broth medium. Solubility and permeability were increased for the product compared to ciprofloxacin.