

Preparation of pH-sensitive freeze-dried glycol chitosan based superporous hydrogels for controlled release system

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The aim of this study was to develop swelling properties of glycol chitosan based hydrogels by forming porous structure. Open channel structure was formed by interconnected pores, so that water was absorbed into the dried hydrogel by capillary phenomenon as well as diffusion. Increased swelling of hydrogels, under acidic conditions, was due to the protonation of a primary amino group on glycol chitosan, and then the hydrogels were put in freeze-dryer during drying process, rendering the hydrogel to be porous. After loading amoxicillin as antibiotics, the drug-gels were prepared by freeze-drying.

The hydrogels were characterized for swelling properties, morphology and mechanical strengths, and swelling studies were performed in different pH solution at 37°C. and antibiotic release from hydrogels was studied in solutions with pH values 1.2. Morphology and pore size of hydrogels were confirmed by scanning electron microscopy(SEM). Mechanical strengths were determined by universal testing machine(UTM). The amoxicillin release of the drug-gels in vitro was examined by UV analysis.