

**Institute of Pharmaceutical Technology and
Regulatory Affairs
Faculty of Pharmacy
University of Szeged**

I. Symposium of Young Researchers on Pharmaceutical Technology, Biotechnology and Regulatory Science

Szeged, Hungary



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Design and characterization of Chitosan/citrate films as suitable multifunctional coating for oral-macromolecule delivery

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Nowadays, biopharmaceuticals are usually used parenterally since their oral delivery may require protection from degradation in the GI tract and enhancement of permeation and absorption [1,2]. Chitosan may isolate macromolecules from the degradation and form a matrix with the glycoproteins of mucus [3]. In addition to its mucoadhesive property, chitosan can control the drug release [4]. Citric acid (CA) can be used as protease inhibitor and as permeation enhancer [5]. The aim of this work was to formulate and to characterize chitosan citrate films.

Chitosan was used as film forming polymer, CA as solubilizing agent and glycerol, propylene glycol or polyethylene glycol were serve as plasticizers. Mucin was used as reagent for mucoadhesivity tests. Films were prepared by dissolving chitosan (2% w/v) with CA (2.5-7 w/v %) by solvent casting method. A screw micrometer (Mitutoyo, Japan) was used to measure the thickness of films, while, hardness and mucoadhesive properties were measured with a laboratory constructed texture analyzer. FT-IR spectra were obtained by an Avatar 330 (ThermoScientific, USA) apparatus and surface free energy was measured indirectly by an optical contact angle-measuring apparatus (OCA20, DataPhysics, Germany).

The results revealed that beside other effects CA also exerts a considerable plasticizing effect, which makes possible to simplify the applied formulations.

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