

4th International Conference on **Nanotek & Expo**

December 01-03, 2014 DoubleTree by Hilton Hotel San Francisco Airport, USA

Biodegradable core-shell polymeric nanostructures as oral delivery carrier for cromolyn sodium

Ravi R Patel, Sundeeep Chaurasia, Gayasuddin Khan, Nagendra Kumar and Brahmeshwar Mishra
Indian Institute of Technology, India

Cromolyn sodium (CS) is a safe and widely used drug for the prevention and treatment of allergic conditions such as allergic rhinitis, mastocytosis and food allergy. Despite its high therapeutic potential, high hydrophilicity and poor permeation across the gastrointestinal tract restricts its entry in systemic circulation. Further, poor encapsulation of hydrophilic drug inside nano-carriers also limits use of colloidal carrier for bioavailability enhancement. In response to defeat these constrains in therapy, polycaprolactone and chitosan based core-shell nanostructures (PCCSNs) have been formulated with an aim to improve drug encapsulation and oral bioavailability thereby, therapeutic efficacy. The PCCSNs were engineered by nanocoprecipitation method. The Box-Behnken experimental design was employed for optimization and investigating the influence of formulation variables on particle size and % encapsulation efficiency. The physical state characterization using DSC, XRD and FTIR of optimized PCCSNs revealed the conversion of crystalline CS to amorphous form without any physical and chemical interactions with carrier. The TEM and CLSM study revealed the smooth spherical shaped core-shell nanostructure and electron diffraction pattern further confirmed the encapsulation of CS in amorphous form. The *in-vitro* release study showed the sustained release of CS up to 48 hr. The marked increase in the permeability of CS was observed in *ex-vivo* and Caco-2 cell line study. Further, *in-vivo* pharmacokinetic study demonstrated the enhancement of oral bioavailability of CS by forming the PCCSNs, proving importance of PCCSNs as potential oral delivery system for CS.

Biography

Ravi R Patel is a PhD Research Fellow in Department of Pharmaceutics, Indian Institute of Technology (Banaras Hindu University), Varanasi, India. He has an excellent academic record to his credit and was awarded gold medal for standing first in post-graduation degree examination. He has been awarded INSPIRE Fellowship from Department of Science and Technology, New Delhi, India for his doctoral research. He has published 04 international papers in peer reviewed journals with cumulative impact factor of 7.8 and filed 01 Indian patent. Presently, he is working on oral delivery of various natural and synthetic drug molecules by using nano-carrier systems.

ravipatel1307@gmail.com