621/E2

Microparticles for the treatment of inflammation of the bowel

W.R.M.de Silva*, K.M.N.de Silva, U. Godakanda and I.S. Wickramasinghe

Department of Chemistry, University of Colombo, Sri Lanka

Inflammation in the digestive tract is a common disease found among most people. Inflammatory bowel disease (IBD) is a condition that causes the digestive system to become inflamed (red, swollen, and sometimes painful). Two types of IBD are ulcerative colitis and Crohn's disease, which cause similar symptoms including diarrhea, abdominal pain, and fever. However, some drugs, which have anti-inflammatory properties, generate severe adverse effects and toxicity. Diclofenac sodium (DS) is a well-known anti-inflammatory drug in the pharmaceutical industry that shows these side effects. However, employing drug-loaded nano/microparticles in drug delivery systems show the potential reduction of such drawbacks. The main objective of our study was to prepare DS-loaded microparticles for the treatment of IBD. At the beginning, we constructed the layout of the particles. Two polymer coatings were necessary to cover the drug inside the particle. The inner coating was prepared by mixing two copolymers, chitosan and polyvinylpyrrolidone, which are often use in drug-delivery systems. A modified ionic gelation method was used in this step. The purpose of creating an inner coating was to slow down the release of the drug in the colon. The outer coat was prepared with a special polymer called Eudragit L100-55 using polyelectrolyte complexation technique. Eudragit polymers dissolve at slightly basic medium similar to the colonic environment. The pH of the gastrointestinal tract (GIT) varies in different locations, and it is essential to avoid the release of drugs inside the GIT. Eudragit polymer coating ensures the transport of the drug until the colon. Prepared microspheres were tested for surface morphology, functional groups, crystal structures, drug loading efficiency, and *in-vitro* drug release by maintaining different pH environments similar to the GIT. The drug-loaded particles have shown considerable drug loading and encapsulation efficiencies. *In-vitro* dissolution tests verified that Eudragit-coated microspheres having a pH-dependent drug release profile. The results indicated that Eudragit-coated chitosan microparticles be employed successfully as potential careers of diclofenac sodium.

*rohini@chem.cmb.ac.lk