

## **Characterization of magnesium orotate-loaded chitosan polymer nanoparticle for drug delivery system**

### **ABSTRACT**

The drug release properties of magnesium orotate (MgOr) encapsulated in the chitosan (CS) cavity and the complexation behavior between MgOr and CS were investigated. The MgOr-loaded CS nanoparticles (MgOrCSNPs) were characterized by differential scanning calorimetry, Fourier transform infrared spectroscopy, X-ray diffraction, transmission electron microscopy, and scanning electron microscopy with energy-dispersive X-ray spectroscopy. MgOr was successfully encapsulated into the CS cavity. Results with 3-(4,5-dimethylthiazol-2-yl)2,5-diphenyl tetrazolium bromide indicated that MgOrCSNPs retained their cytotoxic activity against the liver cancer cell line (HepG2) and breast cancer cell line (MCF-7), and low toxicity against the human cell line (3T3) and human retinal epithelial cell line (ARPE-19).

**Keyword:** Chitosan; Drug delivery; Encapsulation; Magnesium orotate; Nanoparticles