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Bisphosphonates-loaded nanoparticles: Comparison between different nano-formulations

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Incorporation of charged water soluble drug molecules into polymeric nanoparticles (NPs) suffers generally from low incorporation efficiency and prompt release. The aim of this work is to encapsulate such drugs into different types of polymeric nanoparticles and compare between them in terms of drug loading and release kinetics. Risedronate sodium, a third generation bisphosphonate (BP), was used as a model drug. BPs are non-hormonal agents used for the treatment of osteoporosis, Paget's disease and tumor-induced hypercalcemia. A number of biodegradable and biocompatible polymers were used for NP formulations such as PLGA, Eudrgit® and alginate polymers. To the extent of our knowledge, no prior reports showed the encapsulation of BPs into alginate NPs. The resulting drug-loaded nanoparticles were characterized in terms of particle size, zeta potential using Dynamic Light Scattering (DLS) and morphology using Transmission Electron Microscope (TEM). The effect of varying formulation parameters (i.e. drug concentration, polymer concentration and processing parameters) on drug encapsulation efficiency and drug release properties were investigated.

Biography

Samer R Abulateefeh graduated with a BSc degree in Pharmacy from the University of Jordan in 2005. He then spent two years in the local pharmaceutical industry working as a Pharmacist Formulator in Research and Development (R&D) laboratories. Subsequently, he joined the School of Pharmacy at the University of Nottingham, UK and earned his PhD degree in 2011 following a research conducted on developing novel thermo-responsive polymeric nanoparticles for cancer therapy. In 2011, he was appointed as an Assistant at the Faculty of Pharmacy, The University of Jordan. His research interests focus on the preparation of nano-medicines and polymer colloids for drug delivery and biomedical applications.

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