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Controlling the characteristics of polymeric nanoparticles as carriers for the model peptide Capreomycin

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Peptides are short polymers of amino acids linked by peptide bonds. They are unstable in drastic conditions including strongly acidic or alkaline media and high temperature. Polymeric nanoparticles are most popular and more desirable in pharmaceutical field than other colloidal systems because of their stability in biological environment. Two biodegradable polymers of different properties were chosen for this study. Chitosan was chosen as a water soluble polymer while, poly(lactic-co-glycolic) acid (PLGA) as an organic solvent soluble polymer. The polymeric nanoparticles were used as carriers for capreomycin. Capreomycin was chosen as a model therapeutic peptide. Double emulsion ($w_1/o/w_2$) solvent evaporation technique was used in the study. Many formulation factors for nanoparticles optimization were tested including: method of agitation, probe sonication intensity and time, high-shear homogenization speed, pH of dispersion media, in addition to concentration of polymer, drug polymer ratio, type and concentration of crosslinking agents (if needed) and concentration of polyvinyl alcohol (PVA). Controlling these factors allowed for optimizing polymeric nanoparticles as carrier for peptides with smallest possible particle sizes and highest possible entrapment efficiencies. The produced polymeric nanoparticles dispersion were lyophilized and allowed for drug release in phosphate buffer pH 7.4. Different slow release profiles were observed for chitosan and PLGA nanoparticles.

Biography

Mohsen A Bayomi received his Ph.D. from the University of Connecticut, USA. He is now a professor of pharmaceutics at King Saud University, Saudi Arabia. He is interested in pharmaceutical technology and biotechnology. He published many articles in reputed journals concerning microparticles, nanoparticles, liposomal formulations, drug targeting, and *in-vivo* evaluation of dosage forms. He was involved in different research projects funded by the college of pharmacy research center and King Abdul Aziz City of Science and Technology. He is serving as an advisory board member of local and international Journals.

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