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Influence of the formulation factors of structured polymeric aggregates nanoparticles based on chitosan on the release characteristics of diclofenac

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The objective of the research is to understand the influence of formulation factors such ratio of and molecular weight of chitosan, amount and type of fatty acid used, type and concentration of chitosan on the diclofenac release from nanoparticle liquid formulation based on chitosan. The nanoparticle formulation is made of drug, chitosan, fatty acid and a surfactant. Chitosan is capable of forming complexes with anionic substances. Diclofenac is capable of forming complexes/salts with chitosan. Fatty acid was used to shield the drug as it also forms a complex with chitosan. Addition of suitable surfactant made the surface of the particle hydrophilic where it can be dispersed in water as nanoparticle liquid preparation. Different nanoparticles formulations were prepared by varying the concentration of the type of material used. Drug release was studied by placing the formulation inside a semipermeable dialysis tube capable of retaining the complex polymer and allowing the passage of the free drug. The bag was place inside 6.8 phosphate buffer in USP apparatus II at rotational speed of 100 rpm. Samples were withdrawn at suitable intervals and analyzed using validated HPLC method. Results demonstrated that formulas were capable of sustaining the release of the drug and the formulation factors studied influenced drug release characteristics. The change of the in release characteristics was correlated with physicochemical properties of the nanoparticle preparations. Control of the factor studied is essential for the development of sustained release nanoparticle formulation with optimum drug release.

Biography

Bashar M. Altaani has completed his Ph.D. from department of Industrial and Physical Pharmacy in Purdue University in 1999. Dr Altaani Joined the faculty of Pharmacy in Jordan University of Science and Technology in 1999. Dr Altaani currently serves as the chairman of pharmaceutical Technology department. He has published more than 10 papers in reputed Journals.

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Submicron silk particles by surfactant-assisted milling of silk fiber

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Among different fibrous materials for medical applications, silk has received huge attention in recent years. Particles from silk have been widely investigated in the areas of drug delivery, tissue engineering and cosmetic medicine. However, there are major challenges of controlling size and size distribution, safety of the process and products, and structural stability of particles. All most all attempts so far have used regeneration approach using harmful chemicals to generate particles from silk fibres via silk solution. They cannot achieve desired particle size and distribution for biomedical applications and, the fibroin is degraded during the process. In the current study, a new method is presented for production of silk submicron particles (~200 nm) using milling where we preserve the primary structure of the silk. Harmful chemicals are totally avoided. The only chemical used is Tween 80 which is proven by FDA and is used in about 60 per cent of injectable products containing emulsifying agents. We have achieved for the first time submicron particles which have a narrow size distribution, stable and free from harmful chemical residues. This process is expected to open exiting opportunities for application of silk in frontier areas.

Biography

Mehdi Kazemimostaghim is a Ph.D. student at Australian Future Fibers Research and Innovation Center, before joining the Deakin University he worked for about 10 years as R&D manager in chemical industries.

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