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Fructose-assisted structure retention of boronic acid conjugated chitosan nanoparticles

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Boronic acid was functionalised onto chitosan and was successfully formulated into insulin containing nanoparticles via ionotropic gelation and polyelectrolyte complexation. The nanoparticles produced by PEC method were smaller in size and showed higher insulin encapsulation efficiency. The individual steps in the formulation process parameters have significant effect on the encapsulation efficiency of the system. The release of insulin from the nanoparticles depended on a complex interplay between the buffer effects and the sugar effects and hence choice of buffer for such studies must be carefully selected and its effects must also be rightly assessed. Though there was glucose and fructose dependent insulin release, the release is affected by the concentration of the sugar. High concentrations of sugars favour the retention of the nanoparticle integrity through interactions with the boronic acid moiety. This is particularly pronounced with fructose, where bidentate association with boronic acid ensures that the particle remain intact by a seemingly knitted matrix. This results in a diminished permeation of insulin into the media.

Biography

Nashiru Billa has completed his PhD in 2000 at the University of Science, Malaysia. He worked at the International Medical University from 2000-2005 as Lecturer and Cheif Scientist of Bioequivalence lab. He joined the University of Nottingham, Malaysia Campus since 2005. He is currrently a Professor and Associate Dean of Research (Faculty of Science). He has published more than 30 papers in reputed journals and has been serving as an Editorial Board Member of reputable journals.

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