OMICS International
conferenceseries.com

Abhay Asthana, Clin Pharmacol Biopharm 2015, 4:4
http://dx.doi.org/10.4172/2167-065X.C1.013

Pharma Middle East

November 02-04, 2015 Dubai, UAE

Citric acid-PEG-citric acid (CPEGC) triblock dendritic nanocomposites gel based transmucosal drug delivery of antihypertensives

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The present research was aimed to develop and evaluate a CPEGC triblock dendritic nanocomposites for delivery of Amlodepine Besylate (AB). Dendrimer bearing citric acid and PEG spacer linkages were prepared using carbodiimide reactions. Drug was loaded to the 3rd generation dendritic constructs by equilibrium dialysis method to form an inclusion complex within interior channels of Citric acid and PEG. The association/interaction of AB with functional ends of dendrimers was attempted along side with drug inclusion systems in the designed formulations. All synthesized entities/interactions were confirmed by spectroscopic methods and thermal analysis. The drug-delivery units were engineered with composition of (CPEGC) triblock dendritic system, chitosan and poly(N-isopropylacrylamide) formulation of AB to estabilish suitable Lower Critical Solution Temperature (LCST). The preformulation assessments were also conducted with critical formulation ingredients at 25^0C/60% RH and 30^0C/75% RH. The stability of the carrier under different pH, thermal and humidity states was accessed to establish the feasibility of the carrier. The dendritic formulations were characterized *in vitro* for hematological biocompatibility, solubilization, drug release, permeability and stability study to establish drug release and delivery potential. Drug loading increased as molar feed ratio of drug to dendrimer was increased from 0.3:1 to 1.5:1. AB dendritic formulation showed much stringent controlled release of drug (65% in 4^{th} h) compared to reduced MP/Dendrimer ratio in formulation (65% drug release in 2^{nd} h). The formulations displayed acceptable drug content, drug release, permeability, stability. The studies were correlated with release of the drug in presence of buffer medium. The present drug delivery technology can be useful to overcome subtherapeutic doses of the drug due to its extensive metabolism in case of enteral route.

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