Anjala Bulathge, Pharm Anal Acta 2015, 6:1
http://dx.doi.org/10.4172/2153-2435.S1.025

OMICS International
Pharmaceuticalconferences.com

5th International Conference and Exhibition on
Pharmaceutics & Novel Drug Delivery Systems
March 16-18, 2015 Crowne Plaza, Dubai, UAE

pH sensitive Calcium Carbonate-encapsulated Copper bis-(8-hydroxyquinoline) drug delivery system for cancer therapy

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pH sensitive drug delivery systems are very important in targeted drug delivery and systemic control release. The studies in this area have been increased in recent years and more attention has been devoted on development of novel and low-cost methods for the preparation of new drug delivery systems especially in cancer therapy.Among the metal based anti-cancer drugs, copper complexes have great potential.Therefore, the aim of this study is to synthesize a pH sensitive calcium carbonate-encapsulated copper bis-(8-hydroxyquinoline) anti-cancer drug delivery system starting fromnaturally occurring dolomite. In this novel preparation method, first, copper bis-(8-hydroxyquinoline) is synthesized using copper(II) chloride dihydrate and 8-hydroxyquinoline as the reactants. Aqueous solutions ofsodium carbonate andcalcium sucrate prepared by adding calcined dolomite into sucrose are added simultaneously to a template ofmicelles formed by cetyltrimethyl ammonium chloridE (CTAC) on copper bis-(8-hydroxyquinoline) in order to produce the drug delivery system. The release of drug is monitored *in vitro* under the pH values ranging from 2 to 8. According to results, within first four hours, the cumulative release shows 100% in pH 2 and pH4. However, no release is observed in pH 8 for 120 hours. Therefore, it is a good indication that the encapsulated drug releases at the pH trigger point.pH differences can be found at the subcellular level, late endosomes and lysosomes have much lower pH, in the range 4.5-5.5 .Due to high rate of glycolysis, tumors have exhibit pH value 5.7 while the pH value of normal tissue is 7.4. This pH gradient is very important in internalization of drugs. Therefore this has potential applications in effective cancer therapy.

Biography

Anjala Bulathge has recently completed B.Sc. special degree in Chemistry from University of Peradeniya, Sri Lanka. Her final year research project is on preparation of drug delivery system for can therapy under supervision of Prof. R.M.G. Rajapakse. (Department of chemistry, University of Peradeniya, Sri Lanka). Her current area of research is nanotechnology based drug delivery systems.

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