World Academy of Science, Engineering and Technology
International Journal of Biomedical and Biological Engineering
Vol:10, No:03, 2016

pH and Thermo-Sensitive Nanogels for Anti-Cancer Therapy

Authors : V. Naga Sravan Kumar Varma, H. G. Shivakumar

Abstract : The aim of the study was to develop dual sensitive poly (N-isopropylacrylamide-co-acrylic acid) (PNA) nanogels(NGs) and studying its applications for Anti-Cancer therapy. NGs were fabricated by free radical polymerization using different amount of N-isopropylacrylamide and acrylic acid. A study for polymer composition over the effect on LCST in different pH was evaluated by measuring the absorbance at 500nm using UV spectrophotometer. Further selected NG's were evaluated for change in hydrodynamic diameters in response to pH and temperature. NGs which could sharply respond to low pH value of cancer cells at body temperature were loaded with Fluorouracil (5-FU) using equilibrium swelling method and studied for drug release behaviour in different pH. A significant influence of NGs polymer composition over pH dependent LCST was observed. NGs which were spherical with an average particle size of 268nm at room temperature, shrinked forming an irregular shape when heated above to their respective LCST. 5FU loaded NGs did not intervene any difference in pH depended LCST behaviour of NGs. The in vitro drug release of NGs exhibited a pH and thermo-dependent control release. The cytoxicity study of blank carrier to MCF7 cell line showed no cytotoxicity. The results indicated that PNA NGs could be used as a potential drug carrier for anti-cancer therapy.

Keywords : pH and thermo-sensitive, nanogels, P(NIPAM-co-AAc), anti-cancer, 5-FU
Conference Title : ICBPS 2016 : International Conference on Biomedical and Pharmaceutical Sciences
Conference Location : Miami, United States
Conference Dates : March 24-25, 2016

Open Science Index, Biomedical and Biological Engineering Vol:10, No:03, 2016 publications.waset.org/abstracts/43882/pdf