



2nd International Conference on Pharma & Nutrition, Health and Aging

August 1-2, 2019 Valencia, Spain

Polymer -Lipid Hybrid Nanovehicles Designed for Synergistic Drug Delivery for Solid Tumor Management

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Efficient dual targeted chemotherapy is an attractive approach for killing the tumor cells and tumor endothelial cells, while sparing the normal tissue. Herein, we investigated whether encapsulation of paclitaxel (PTX) within polymer–lipid hybrid nanoparticles conjugated with kNGR (PLNs-kNGR) achieved this goal in a subcutaneous tumor induced Balb/c mice bearing HT-1080 tumor model with nanocarrier-modified biodistribution and toxicity. The dual targeted PLNs-kNGR was prepared by modified nano-precipitation technique combined with self-assembly and evaluated for different parameters. Compared with other tested NPs, PLNs-kNGR-NPs revealed more cytotoxicity by inducing more apoptosis, higher intracellular uptake and % tumor volume inhibition rate that was 59.7%. These findings substantiate the importance of rational design of nanoparticles for dual targeting synergistic therapy. As a consequence, the PLNs-kNGR-NPs play a key role in enhancing tumor therapeutic efficiency for treatment of CD13 receptor specific solid tumor.

Biography:

Dr. Madhu Gupta has research experience pertaining to drug delivery to nanoformulations for magical molecule delivery, bioligands for targeting of bioactives and drug moiety, biopolymers, cancer nanomedicine as well as topical delivery. She is pioneer scientist in the field of nanotechnology and drug delivery field. She has over 35 research publications to her credit published in journals of high scientific impact and contributed 14 chapters in various renowned books and to several international and national books. Dr. Gupta has H-index of 15, i14-index of 11 and more than 500 citations.