

Hybrid Polymer-Lipid Nano-Engineered Particles Designed for Dual Targeted Synergistic Drug Delivery for Solid Tumor Targeting

Madhu Gupta

Delhi Pharmaceutical Science and Research University, India

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.

Keywords: kNGR peptide, CD13 receptor, targeted therapy, polymer lipid hybrid nanoparticles, intracellular delivery.

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 that is carried out at Department of Pharmaceutical Sciences, Dr. H.S. Gour Central University, Sagar. Dr. Gupta has done her B. Pharm (Gold Medalist), M. Pharm., Ph.D. in Pharmaceutics with experience of more than 10 years in academics, administrative functions and research in areas of Pharmaceutical nanotechnology and targeted drug delivery related to cancer, fungal infection, and psoriasis.

Presently she is working as an officer on Special duty to Vice-Chancellor, in Delhi Pharmaceutical Sciences and Research University. Along with teaching and research, she is member secretary of World Class skill Centre courses, PRO, Web site In-charge, IQAC incharge as well as hostel warden. Dr. Gupta is the course co-ordinator for Cosmeceutics in the university. She has worked as Associate Professor and Departmental head (2013-2016), Research and Academic Coordinator Coordinator (2013-2016), Training and placement officer (2013-2016), Library incharge (2013-2016), Coordinator, Industrial training, Industrial visits and expert lectures (2013-2016), Coordinator for organizing conferences, seminars in Shri rawatPura Sarkar Institute of Pharmacy, Datia M.P.

She is pioneer scientist in the field of nanotechnology and drug delivery field. She has judiciously exploited bioligands for targeting of bioactives and drug moiety. 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 11, i10-index of 11 and more than 500 citations. She has the awardees of various national and International conference in the form of best oral and poster presentation award. She has supervised 13 M.Pharm students. Dr. Gupta has availed several prestigious fellowships and awards SRF AICTE (NDF), JRF (AICTE), Travel grant awards (DST, ICMR, INSA, and DBT, MPCST), Prof. G.P. Nait Award (2004), Prof. C.S. Chauhan Award (2004). She has her research work at BioAsia Innovation Award – 2012. She is successfully complete one project that is funded by MPCST Bhopal.

She is the nominee of CPCSEA and also active member of various Pharmaceutical body such as APTI and other. She is reviewer of various journals of repute. She has attended various conferences/seminars/workshops/FDPs as organizer/co-ordinator/resource person/participant. Dr. Gupta and her team has been selected for funding of 1 start-up.