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Investigation of ethyl cellulose and eudragit L100-55 blended nanoparticles for oral controlled delivery of paclitaxel: *In vitro* and *in vivo* evaluation

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In this study, a series of pH sensitive polymeric nanoparticles using blend of ethyl cellulose and a commercially available poly (methacrylic acid-co-ethyl acrylate) derivative, Eudragit L 100-55, were synthesised to establish their potential use in oral delivery of Paclitaxel (BCS class IV drug). Prepared nanoparticles were characterized through various analytical techniques and *in vitro* dissolution studies were performed to confirm the pH dependent controlled release behavior. Optimised formulation was then subjected to single dose, non-compartment pharmacokinetic analysis in rabbits to further establish the potential of site specific and sustained drug release. FTIR confirmed the formation of co-polymeric network. DLS and SEM revealed round, smooth and somewhat uniformly distributed nanoparticles within the size range of 750 ± 1.81nm to 899 ± 1.25nm. Developed PTX- nanoparticles shown pH responsive drug release behavior with an ability to release drug in sustained fashion following non-Fickian diffusion mechanism. Pharmacokinetic profiling confirmed delayed release of drug with slow systemic absorption suggesting increased residance time of chemotherapeutic drug in lower part of GIT, which can be utilized for localized delivery of drug in colon to treat colorectal cancer.

References

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Biography

Mahvash Ansari is pharmacist by profession having post graduation research in novel drug delivery systems in MPhil and PhD. Having more than 10 year professional experience in area of teaching, research, regulation and quality control of medical products, currently leading NCL for Biologicals, Drug Regulatory authority of Pakistan, as Director and team lead for WHO-WLA. She is member of Federal Procurement Committee, Committee on availability of Essential medicine and audit team. Has national and international trainings on audit and quality of medical products and resource person for WHO and USP trainings. She is also guest lecturer at AKUH, NUMS and HSA.

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