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## Design and Characterization of Thermo and pH Dual Responsive Polymeric Nanoparticles for Cancer Therapy

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The principle objective of this research was to develop and characterize a biodegradable, thermo and pH dual responsive oxaliplatinloaded chitosan-graft-poly (N-isopropylacrylamide) (CS-g-PNIPAAm) copolymeric nanoparticles as a tumor-targeting drug delivery system. CS-g-PNIPAAm copolymers were synthesized via soapless dispersion co-polymerization and characterized by FT-IR, 1H NMR (chemical structure) and DSC (LCST -Lower critical solution temperature). These copolymers could be efficiently loaded with oxaliplatin and Nanoparticles were evaluated for their morphology (SEM), particle size (TEM), zeta potential, loading efficiency and drug content. *In vitro* drug release study was carried out at different pH values (5.5, 6.5 and 6.8) & 400 C temperature as well as at physiological pH & temperature conditions. *In vitro* cytotoxicity study was performed on Human colon carcinoma cells HT-29. Nanoparticles exhibited porous inner structures with a particle size of 120-150 nm and zeta potential of about -61 ±12 mV. Loading efficiency and drug content were found to be 82.8% and 53.7% respectively. The drug release was slow at physiological pH and temperature i.e., only about 25% while the release rate was drastically increased to above 70% at acidic pH and temperature above LCST (400C). Based on MTT assay the anti-tumor activity of drug loaded nanoparticles shows very less cytotoxicity as compaired to pure drug at pH 7.4 and 370 C and shows higher cytotoxicity than that of pure drug at 400C and 6.5 pH on HT-29 cell lines. In conclusion, the obtained nanoparticles appeared to be of great promise in tumor targeted drug delivery of oxaliplatin.

## Biography

Archana Patil has completed her M.Pharma in 2010 (Age-28) from Rajiv Gandhi University of Health Sciences, Banglore and registered for postdoctoral studies in 2012 as a full time research scholar under the faculty of pharmacy, K.L.E.University, Karnataka. Presently, she is a full time research scholar under the faculty of pharmacy, K.L.E.University, Karnataka.

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