

Title: Formulation, characterization and evaluation of biodegradable nanogel for the treatment of melanoma

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Abstract:

Background Melanoma is a cancer that grows from melanocytes and the most lethal form of skin cancer with 70-75% of mortality. Targeted drug delivery is blooming stream in the field of medicine and disease treatment especially cancer. Methods Chitosan and Pluronic solvent system was used to prepare nanogel. TEM, SEM & DLS were employed for morphological analysis of nanogel. Haemolysis & PT-APTT and MTT & Apoptosis assays were employed for biocompatibility and cytocompatibility assessment. HaCaT cell line was used for cell uptake studies and DMBA-Croton oil animal model was employed for in-vivo assessment. Results The nanogel was synthesized by chitosan, TPP and Pluronic 127. The nanogel exhibits particle size 170nm screened by TEM, SEM & DLS analysis. Nanogel exhibit cationic nature with acidic pH with fine gelling property and viscosity. The In vitro cell lines results exhibits hemo- compatible and cyto- compatible potentials with prominent permeation strength. In vivo pharmacokinetic and histo-pathological profile reveals perceptible anti-melanoma potential with negligible effect on normal melanin cells compare to the marketed standard 5-Flurouracil gel at very low dose and frequency. Conclusion The biodegradable nanogel offers biocompatible characteristics with sustained release onsite delivery with pH responsive and ionic attraction mechanism proving as boon for effacious treatment of melanoma and discovering novel potent topical treatment in the management of skin cancer