Erlotinib is actively expressed in tumor cells by blocking EGFR signaling and thereby control the growth of tumor cells. Block copolymeric micelles are used to enhance the delivery of hydrophobic drugs and improve the pharmacokinetics of the loaded drug. Covalent drug entrapping in cross-linked polymeric micelles prevents premature release. In this study, the synthesized block co-polymeric micelles of erlotinib for the target drug delivery were characterized by FTIR and NMR Spectroscopy for the structural conformation.

Different surfactants and polymers were used to prepare micelles and evaluated for different characteristics. With an optimum ratio of screened polymers that impact micelle size and zeta potential, cross-linking of Pluronic F-68, polycaprolactone was performed via chemical reaction and confirmed by FTIR. The resulting crosslinked polymer was used to develop a formulation with a statistical approach via Factorial Design and evaluated. Optimization with Minitab software which revealed a Design matrix and graphical presentation via contour plot revealed science-based development of formulation and resulted in requisite entrapment efficiency of 94 % in ratio 1:5. The issue of low drug entrapment into the micellar core would be overcome by using fabricated co-block polymer in optimized concentration with 0.9% NaCl and 37ºC temperature. The micellar size of the optimized formulation was found to be 115.1 nm. Critical micelles concentration was found to be 3× 10 -5 M equivalent to 1.08 mg Copolymer. Drug release of optimized block co-polymeric micelles was found 89.45% in 96 hrs. In nutshell, Co block polymeric micelles would be platform delivery for targeting anticancer agents.