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Erlotinib nanosuspension: *In vitro* anti-cancer study using colon cancer cell line

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Erlotinib is used for the treatment of lung and pancreatic cancer. The clinical usage of erlotinib is limited due to its poor solubility and dissolution rate. The objective of the research work is to formulate erlotinib nanosuspension with improved solubility and dissolution rate and investigation of its anticancer activity against colon cancer cell line (HCT 116). Erlotinib nanosuspension (ENS) was prepared by high pressure homogenization method. Characterization of ENS was performed using zeta potential analysis and particle size termination by SEM analysis. ENS was subjected to solubility study as well as stability study. Further, ENS was subjected to *in vitro* anti-cancer activity against colon cancer cell line. The study results indicated that the prepared ENS by high pressure homogenization method include several advantages, such as suitable for poorly water soluble drugs/ herbal drugs and suitable for large scale production. Particle size of ENS showed range from ~5 to 26 nm. Zeta potential value of formulated nanosuspension was obtained as 3.16 mv. Solubility study indicated that formulated ENS enhanced the solubility of the erlotinib. Stability study showed ENS was stable in room temperature and cold temperature. ENS exhibited significant anti-cancer activity against HCT-116 Cell line at dose dependent manner. The study concluded that high pressure homogenization method could be suitable to improve the solubility of erlotinib and ENS exhibited effective anti-cancer activity against colon cancer cell line.

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