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Formulation and evaluation of anticancer activity of etoposide loaded freeze dried PLGA nanoparticles (Nanocarrier)

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toposide is a anticancer drug used in various types of cancer like prostate tumor carcinoma, lung, ovarian cancer. The objective of present investigation is to formulate the lyophilized poly(lactide-co-glycolide) PLGA based nanoparticles of poorly water soluble anticancer drug Etoposide to improve its therapeutic efficiency, reduced side effects and to sustained its release. The Etoposide loaded PLGA based polymeric nanoparticles were prepared by modified spontaneous emulsification solvent evaporation (SESD) and modified nanoprecipitation method using various solvent systems .The resultant nanoparticles were lyophilized to achieve long term stability. In lyophilisation, parameters like cryoprotectant ratio, cooling rate were optimized. Various evaluation parameters like in vitro drug release, SEM, DSC, FTIR, were carried out. The cytotoxicity of resultant freeze dried formulation was evaluated using LNCaP Prostate tumor cell line study using XTT assays. The modified -SESD method provided a good yield of PLGA nanoparticles over a wide range of composition ratios in the binary mixtures of organic solvents. The mean particle size was found around 300 nm. The etoposide loaded nanoparticles showed a cumulative drug release over 72 hrs. The in vitro anticancer activity of etoposide loaded PLGA nanoparticles were evaluated using LNCaP prostate tumor cell line. Blank nanopaticles and control (plain etoposide solution) showed lower cytotoxicity compared to Etoposide loaded nanoparticles. The Etoposide loaded PLGA based nanoparticles showed a more sustained release, a long circulation time, increased the delivery to tissue, and an enhanced anticancer effect. Therefore, etoposide loaded nanoparticles may be considered effective drug delivery system for chemotherapy.

Biography

Priyal Patel, has completed his B.Pharm and M.Pharm from The M S University of Baroda, Vadodara in year 2000 and 2002. He has teaching and research experience of 10 years. He finished his PhD from Ganpat University, India. He has many around 20 publication in national and international journals.

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