**ABSTRACT**

An attempt was made in this study to formulate and evaluate the polymeric nanoparticles of anti-cancer drug using biodegradable and biocompatible polymerssuch as chitosan and PLGA. In this formulation Gefitinib was used as model drug because of its wide range of use in treatment of cancer such as non-small cell lung cancer, breast cancer, pancreatic cancer etc., in the form of tablet. FTIR and DSC confirmed that there is no interaction between the drug and polymers and excipients

used in the formulations. Gefitinib loaded chitosan nanoparticles were prepared using ionic gelation technique and use of different concentrations of chitosan and STPP was used as cross linker. Gefitinib loaded PLGA nanoparticles were prepared by means ofnanoprecipitation method and emulsification followed by homogenization technique using different concentrations of PLGA and stabilized by PVA. The prepared nanoparticles were characterized in case of %entrapment efficiency, particle size, poly dispersity index, zeta potential, %release upto 72 h. After response optimization

study, GCN1 and A5 were selected as optimized formulations. Morphological characterization by SEM, stability studies, in-vitro cytotoxicity studies on A549 cell lines by MTT assay and in-vivo anti-cancer effect on non-small cell lung cancer induced nude mice were done for optimized formulations. Effect of the prepared nanoparticles were evaluated for body weight change, blood haematological parameters, mean survival time and %increase in life span and compared with Gefitinib. A5 and GCN1 showed 29.16% and 20.83% increase in life span as compared with Gefitinib which showed 16.66%. Thus the study revealed that the developed nanopaticulate system has a great appeal for the conventional treatment for non-small cell lung cancer.

Key words: Gefitinib, Nanoparticles, Chitosan, PLGA, Ionic gelation,

Nanoprecipitation, Homogenization