

23<sup>rd</sup> International Conference on  
**Nanomaterials and Nanotechnology**  
March 15-16, 2018 | London, UK

**Folate receptor-targeted Copolymeric nanoparticle to enhance the chemotherapeutic efficacy in lung cancer.**

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Cancer is an ever-increasing menace that needs to be curbed soon. Though chemotherapy is successful to some extent, but main drawbacks is the limited accessibility of drugs to the tumor tissues requiring high doses, intolerable toxicity, development of multiple drug resistance and their non-specific targeting. Among various cancers lung cancer was commonly seen in many peoples, mainly due to the habit of smoking. Inhalation of anticancer drugs directly into the lungs could result in high localization of therapeutic moiety and can greatly improve the chemotherapy against sensitive and resistant lung cancers. This approach was further improved by conjugating an active targeting ligand to the delivery vehicle which was specific only to the cancer cells in a receptor-mediated pathway. Such system is expected to release its therapeutic load in the lungs either within the tumor microenvironment or within the cancer cells. In the present study investigated the efficacy of folate receptor- (FRA)- targeted PLGA nanoparticles against human lung cancer cells. The study describes the development of polylactide glycolic acid-polyethylene glycol 1000 succinate (PLGA-PEG) based nanosystem as a carrier of Silibinin to achieve superior anticancer efficacy in lung cancer therapy. Formulations were optimized by QbD Approach. Copolymer structure was confirmed by NMR Spectroscopy and is capable of self-assembling into a very stable nanocarrier. Drug release study showed a sustained release pattern as a result of entrapment in the hydrophobic core of micelles. SB loaded NP showed a noticeable effect in A549 lung cancer cells in a dose-dependent manner. Rat treated with prepared copolymeric Nanoparticle remarkably suppressed the tumor growth (~90% tumor inhibition) with 100% survival rate. Tissue distribution study shows the major amount of drug distribute to the targeted tissue such as lung. The small size of the nanoparticle resulted in an enhanced cellular entry and greater bioavailability. This delivery platform opens up a wide range of treatment application of lung cancer by nanoparticulate drug delivery system.

**Key words:** Silibinin, Nanoparticles, QbD, Active targeting, Lung cancer.

**Biography**

Ms. Priya V. Patel. currently working as an Assistant Professor in Saurashtra University. Her Area of Interest is Nanoparticulate Drug Delivery System, Pulmonary targeted and Novel drug delivery system.

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