

## **Cellular Uptake and Endocytosis of Doxorubicin Loaded Methoxy Poly (Ethylene Glycol)-Block-Poly (Glutamic Acid) [DOX/mPEG-b-PLG] Nanoparticles against Human Breast Cancer Cell Lines**

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**Abstract :** pH responsive block copolymers consist of mPEG and glutamic acid units were synthesized in different formulations. The synthesized polymers were structurally investigated. Doxorubicin Hydrochloride (DOX-HCl) as a chemotherapy medication for the treatment of cancer was selected. DOX-HCl was loaded and their drug loading content and drug loading efficiency were determined. The nanocarriers were obtained in small size, well shaped and slightly negative surface charge. The release study was carried out both at pH 7.4 and 5.5 and it was revealed that the release was sustained and in controlled manner and there was no initial burst release. The in vitro release study was further carried out for different formulations with different glutamic acid moieties. Time dependent cell proliferation inhibition of the free drug and drug loaded nanoparticles against human breast cancer cell lines MCF-7 and Zr-75-30 was observed. Cellular uptakes and endocytosis were investigated by confocal laser scanning microscopy (CLSM) and flow cytometry. The biocompatibility, optimum size, shape and surface charge of the developed nanoparticles make the nanoparticles an efficient drug delivery carrier.

**Keywords :** doxorubicin, glutamic acid, cell proliferation inhibition, breast cancer cell

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