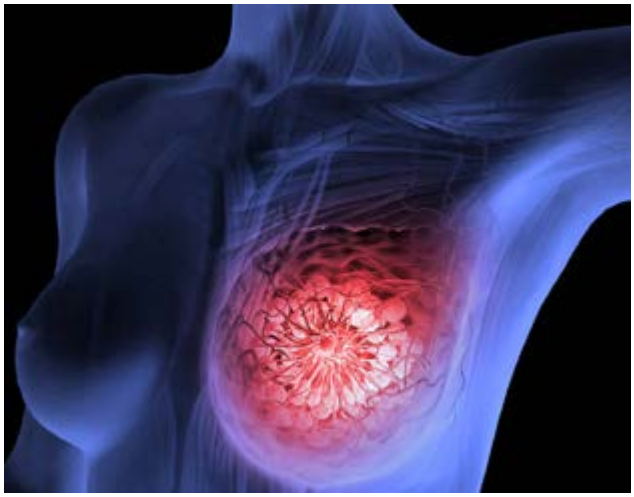
Meetings International SciTechnol

Pankaj Singla et al., J Addict Behav Ther Rehabil 2018, Volume: 7
DOI: 10.4172/2324-9005-C3-014

Co-delivery of quercetin and paclitaxel drug via tri-block (PEO-PPO-PEO), PVP57-PVA30-PEG13 and di-block (PVP-PVA) copolymeric mixed micelles for drug resistant Breast Cancer

Pankaj Singla[1, 2], **Rakesh Kumar Mahajan**[2, 3], and **Marloes Peeters**[1]
[1]Manchester Metropolitan University, UK
[2]Guru Nanak Dev University, India
[3]DAV University, Jalandhar

Breast cancer is the second most common cancer worldwide after lung cancer and the fifth most common cause of cancer death in women. The worldwide weight of breast cancer surpasses every single other cancer and the frequency rates of cancer are expanding. In light of these grim statistics, we have developed novel PEO_{13}-PPO_{45}-PEO_{13} and PVP_{111}-PVA_{86}, PEO_{13}-PPO_{45}-PEO_{13} and PVP57-PVA30-PEG13 mixed micelles for the co-delivery of Quercetin (QCT) and Paclitaxel (PTX) for the treatment of Drug-resistant breast cancer. Pure and mixed nano-micelles were prepared using the direct dissolution method and characterized by fluorescence spectroscopy, dynamic light scattering (DLS) and scanning electron microscopy (SEM). UV-visible spectroscopy as well as the High performance liquid chromatography (HPLC) has been employed to screen the loading of anticancer drugs in different ratio of mixed micelles. We observed that loading of anticancer drugs in mixed micelles is higher than that of the pure polymeric micelles. The locus of solubilization of the anticancer drugs (QCT and PTX) in these polymeric micelles has been adjudged by ^{1}H NMR spectroscopy. In-vitro drug release of the prepared formulations was performed using dialysis release methods. Cytotoxicity assay of prepared formulations was also performed on MCF-7 and triple negative breast cancer cell line MDAMB-231 to find out the anticancer activity. Furthermore, mixed micelles showed a significant increase on QCT and PTX cellular uptake in comparison with pure pluronic micelles and free drug in all cell lines assayed.



Biography

Pankaj Singla is pursuing PhD under the supervision of Prof. R. K. Mahajan from GNDU, Amritsar India and currently he is working as Visiting PhD scholar under the supervision of Dr. Marloes Peeters in Manchester Metropolitan University, Manchester UK. His area of interest is studying of delivery of hydrophobic drugs vs. anticancer drugs, and antiepileptic drugs via polymeric based nanoparticles.

pankee22@gmail.com

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