

Inhalable particulate drug delivery systems for lung cancer therapy: Nanoparticles, microparticles, nanocomposites and nanoaggregates

Abdelaziz, H.M.^{a,b}, Gaber, M.^a, Abd-Elwakil, M.M.^a, Mabrouk, M.T.^{a,b}, Elgohary, M.M.^{a,b}, Kamel, N.M.^{a,b}, Kabary, D.M.^{a,b,c}, Freag, M.S.^{a,d}, Samaha, M.W.^{a,b}, Mortada, S.M.^{a,b}, Elkhodairy, K.A.^{a,b}, Fang, J.-Y.^{e,f,g}, Elzoghby, A.O.^{a,b}

^a Cancer Nanotechnology Research Laboratory (CNRL), Faculty of Pharmacy, Alexandria University, Alexandria, 21521, Egypt

^b Department of Industrial Pharmacy, Faculty of Pharmacy, Alexandria University, Alexandria, 21521, Egypt

^c Department of Pharmaceutics, Faculty of Pharmacy, Pharos University at Alexandria (PUA), Alexandria, Egypt

^d Department of Pharmaceutics, Faculty of Pharmacy, Alexandria University, Alexandria, 21521, Egypt

^e Pharmaceutics Laboratory, Graduate Institute of Natural Products, Chang Gung University, Taoyuan, 333, Taiwan

^f Research Center for Industry of Human Ecology and Research Center for Chinese Herbal Medicine, Chang Gung University of Science and Technology, Kweishan, Taoyuan, 333, Taiwan

^g Department of Anesthesiology, Chang Gung Memorial Hospital, Kweishan, Taoyuan, 333, Taiwan

Abstract:

There is progressive evolution in the use of inhalable drug delivery systems (DDSs) for lung cancer therapy. The inhalation route offers many advantages, being non-invasive method of drug administration as well as localized delivery of anti-cancer drugs to tumor tissue. This article reviews various inhalable colloidal systems studied for tumor-targeted drug delivery including polymeric, lipid, hybrid and inorganic nanocarriers. The active targeting approaches for enhanced delivery of nanocarriers to lung cancer cells were illustrated. This article also reviews the recent advances of inhalable microparticle-based drug delivery systems for lung cancer therapy including bioresponsive, large porous, solid lipid and drug-complex microparticles. The possible strategies to improve the aerosolization behavior and maintain the critical physicochemical parameters for efficient delivery of drugs deep into lungs were also discussed. Therefore, a strong emphasis is placed on the approaches which combine the merits of both nanocarriers and microparticles including inhalable nanocomposites

and nanoaggregates and on the optimization of such formulations using the proper techniques and carriers. Finally, the toxicological behavior and market potential of the inhalable anti-cancer drug delivery systems are discussed. © 2017 Elsevier B.V.

Reference:

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