Mona Kabiri et al., J Nanomed Nanotechnol 2017, 8:4(Suppl)
DOI: 10.4172/2157-7439-C1-050

PLGA based nanoparticles as protein carriers: Radiolabeled protein delivery system

Mona Kabiri[1-3], Mohsen Tafaghodi[2], Mojtaba Sankian[4], Kayvan Sadri[5] and Johannes Oldenburg[3]
[1]Student Research Committee, Mashhad University of Medical Science, Iran
[2]Nanotechnology Research Center, School of Pharmacy, Mashhad University of Medical Science, Islamic Republic of Iran
[3]Institute of Experimental Hematology and Transfusion Medicine, University of Bonn, Germany
[4]Immunology Research Center, School of Medicine, Mashhad University of Medical Sciences, Iran
[5]Nuclear Medicine Research Center, Mashhad University of Medical Sciences, Iran

Among the novel delivery systems, polymeric nanoparticles have been considered as promising carriers for therapeutic applications. The use of biocompatible and biodegradable polymers such as Polylactic-Co-Glycolic Acid (PLGA) as protein and drug carriers has long been of interest in controlled-release technology. PLGA nanoparticles act as potential carriers for several classes of lipophilic and hydrophilic drugs such as anticancer agents, immunomodulators and hormones, as well as macromolecules including nucleic acids, proteins, peptides, and antibodies. The PLGA nanoparticles were prepared by water-in-oil-in-water (w/o/w) (double emulsion) method. In this method, the aqueous protein solution (BSA) was added to the PLGA organic solution. The mentioned method is best suited to encapsulate water-soluble drugs like peptides, proteins and vaccines. The nanoparticles were characterized in terms of particle size, poly dispersity index (PDI) and zeta potential, as well as entrapment efficiency of I-125 labeled BSA. Furthermore, particle morphology and size are determined with scanning electron microscopy (SEM). As estimated by dynamic light scattering (DLS), the mean size of the PLGA nanoparticles were about 150 nm and 185 nm (n=5) for blank PLGA and PLGA-BSA after lyophilization, respectively. Also, The DLS analysis indicated a unimodal particle size distribution, with PDI of 0.2 and zeta potential of -38 mV. PLGA polymers were non porous, smooth surfaced and spherical in structure under SEM with a mean particle size ranging from 70 to 100 nm. The loading efficiency of the radiolabeled protein in PLGA nanoparticles was 91.2%. Radiolabeled protein encapsulated in PLGA nanoparticles can be useful for therapeutic projects.

Biography

Mona Kabiri is a PhD Candidate of Pharmaceutical Nanotechnogy at School of Pharmacy, Mashhad University of Medical Sciences, Mashhad, Iran. She is a Guest Researcher at Institute of Experimental Hematology and Transfusion Medicine, University of Bonn, Bonn, Germany. She finished her PhD thesis about protein vaccine delivery system based on PLGA polymeric nanoparticles and nano-adjuvants. She has published three articles in ISI journals and has three national and US-patents.

mona.kabiri@gmail.com

Notes: