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TARGETING STRATEGIES OF RADIOPHARMACEUTICALS BY USING DRUG DELIVERY SYSTEMS FOR CANCER IMAGING

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Cancer is one of the leading causes of mortality worldwide. Usually, the diagnosis of cancer at an early stage is important to facilitate proper treatment and survival. Nuclear medicine has been successfully and widely used in the diagnosis, staging, therapy and monitoring of cancers by allowing scientists and physicians to see what is happening in the body at a cellular level. Radiopharmaceuticals are radioactive drugs which consist of a pharmaceutical compound and a radionuclide part. After administration, the pharmaceutical compound moves to the target tissue and the emitted radiation is detected by using gamma cameras. Since high target/non-target uptake ratio is critical in nuclear imaging studies, likewise conventional drugs radiopharmaceuticals are necessitating alternative and safer treatment drug delivery strategies. Nanomedicine has developed to resolve issues with poor drug solubility, nonspecific cytotoxicity, suboptimal pharmacokinetics and pharmacodynamics, as well as poor bioavailability. In last decays, drug delivery systems likewise include liposomes, polymeric nanoparticles, dendrimers, micelles, mesoporous silica nanoparticles and gold nanoparticles, among others are being evaluated as potential radionuclide carriers in radiopharmacy. Scientists have designed radiopharmaceuticals to accumulate both active and passive targeting. Passive targeting is a means by which drug can enter tumors due to enhanced fenestrations in tumor vasculature and take advantage of the enhanced permeability and retention (EPR) observed in solid tumor. The enhanced permeability and retention (EPR) effect allows for some selective tumor uptake and retention of nanoparticles due to the leaky tumor vasculature and poor lymphatic drainage in tumors respectively. Also by surface modifications of nanoparticles using polyethylene glycol (PEG), the circulation time of nanoparticles in the blood can extend, while the mononuclear phagocytic system (MPS) recognition and removal reducing. A multidisciplinary approach with collaborations between theoretical and experimental scientists likewise radiopharmacist, pharmaceutical technologist, medical doctors, chemist, biotechnologist etc., is therefore required to improve new targeted radiopharmaceuticals in the clinic.

Biography

Derya ilem Ozdemir has completed her PhD from Ege University and postdoctoral studies from Stanford University School of Medicine. She is working as an Associate Professor in Ege University Faculty of Pharmacy. She has patent grants, more than 25 papers in reputed journals and has been serving as an Editorial Board Member of repute.

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