Nanoparticles Improved Drug Radio Protective Activity

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Abstract

Radio protective agents are synthetic compounds or natural products that are immediately administrated before irradiation to reduce injuries caused by ionizing radiation. Toxicity, short duration, and the unfavorable routes of administration, have prevented the widespread use of most radio protective agents in practice. This study aimed to evaluate the use of slowly release-long circulation biodegradable polymer Poly (lactide-co-glycolide) (PLGA) as carrier for certain water soluble radio protective agents. Penicillamine and Potassium lodide (KI) were selected as examples radio protectors which can be used to protect against both internal radionuclide (chronic radiation exposure) and external beam irradiation (acute radiation exposure). Emulsion-solvent evaporation method (ESE) was used to prepare hydrophilic-drug loaded PLGA Nanoparticles (PLGA-NPs) is an efficient and reproducible manner. Results revealed that single oral administration of Penicillamine-NPs or KI-NPs was effective as free drug (for 5 successive days) which indicate that PLGA-NPs could be used to modulate radio protective drug activity in biological system, and to improve drug efficacy in different body organs for longer duration than the equal dose of free drug.

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