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TITLE

Delivery of Oligopeptide Drug into Bone Marrow Macrophages (BMMs) using Nanoparticels Carriers

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Bone marrow macrophages (BMMs) derived from bone marrow cells are differentiated into osteoclasts by stimulation with macrophage-colony stimulating factor (M-CSF) and receptor activator of NF-κB ligand (RANKL). Osteoclasts are capable to resorb bone and essential for bone homeostasis. The inhibition of osteoclasts formation was suggested to be a potential therapeutic treatment for bone diseases such as osteoporosis and arthritis. Previously, we have developed a cell-permeable oligopeptides that inhibit osteoclast maturation. In this study, we designed a series of dendritic amine modified (SF-A4) and guanidinium modified (SF-G4) nanoparticles. The oligopeptide drug was encapsulated into the nanoparticle by dropping the drug/carrier dissolved in imethylsulfoxide/methylene chloride co-solvent into water containing poly (vinyl alcohol) as a stabilizer. The cellular uptake of nanoparticles containing the oligopeptides was investigated for carriers (SF-G4 and SF-A4) as a function of time. In particular, SF-G4 was taken up more efficiently than amine group-modified ones. Flow cytometry and spectrofluorimetry analysis indicated that the model drug itself was not taken up by the BMMs; however, nanoparticle systems underwent significant cellular uptake. Cell viability studies showed that both amine and guanidinium group-modified nanoparticles exhibited no significant cytotoxicity up to 100 μg/mL against the cells.

Biography

So Jeong Park has completed her master's degree at the age of 24 years from Ewha Womans University. After she worked in Korea Research Institute of Bioscience and Biotechnology, she is currently doing her Ph.D at Ewha Womans University under the supervision of Dr. Soo Young Lee. Her research is focused on cell signaling, specifically in bone cells including osteoclasts and osteoblasts. She has 3 scientific publications.