pH and/or Temperature Responsive Micelles and Hydrogels for Biomedical Applications

이두성*
성균관대학교
(dslee@skku.edu*)

Stimuli-responsive polymeric systems, including micelles and hydrogels, have attracted extensive attention as "smart" materials for biomedical applications, because the polymer structure and property can change responding to external environments such as pH and temperature. In this presentation, we would like to introduce some of our recent works on the pH and/or temperature responsive micelles and hydrogels for drug and cell delivery and molecular imaging applications.

In our system, the pH-responsive polymeric micelles were composed of hydrophilic methoxypoly(ethylene glycol) (MPEG) and pH-responsive degradable poly(β-amino ester) (PAE) segments. Antitumor efficacy was evaluated from in vitro and in vivo experiment. Besides, pH-responsive micelles were used for MRI (magnetic resonance imaging) agent carrier. On the other hand, we have also investigated an injectable carrier of pH/ temperature sensitive hydrogel, penta-block copolymer PAE-PCL-PEG-PCL-PAE, for controlled drug/protein delivery. The cationic nature of PAE is used as the second function to make the ionic complexes with anionic biomolecule loaded into the hydrogel such as insulin.