

pH and/or Temperature Responsive Micelles and Hydrogels for Drug Delivery and Molecular Imaging

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In this presentation, we would like to introduce some recent works on the pH and/or temperature responsive micelles and hydrogels for controlled drug delivery and molecular imaging applications.

Micelles

In our system, the pH-responsive polymeric micelles were composed of hydrophilic methyl ether poly(ethylene glycol) (MPEG) and pH-responsive degradable poly(β -amino ester) segments. This diblock copolymer, which could self-assemble nano-sized micelles with core-shell structures under aqueous conditions, showed noticeable the pH-dependent micellization-demicellization behavior.

Hydrogels

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. As a result, the release of drug/protein from this hydrogel device can be controlled by the degradation of copolymer.