Drug delivery and release using AuNR-photosensitizer based on disulfide cleavage trigger

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Improving the efficacy of drug delivery and release using gold nanocarriers has been a main issue of cancer therapy. In this study, we developed AuNR-photosensitizer (PS) conjugates with disulfide bond. The release activity is triggered by intracellular glutathione (GSH) concentration. Also photodynamic and photothermal therapy were investigated by using free PS and AuNR-PS conjugates, respectively. A series of AuNRs with different aspect ratio were prepared by seeded growth method. Then, block copolymers with tumor targeting linkage were employed to modify the AuNRs surface. The physicochemical properties, singlet oxygen generation, drug release and photothermal activities of the AuNRs-based system were evaluated. In vitro cellular uptake and phototoxicity of AuNR-photosensitizer conjugates were also investigated using MCF7 and A549 cell lines.