

## Facile Synthesis of Plasmonic Hybrid Nanogels for Light-Initiated Drug Delivery

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Light has intuitive, easy-controllable, and good spatiotemporal specificity that is advantageous in controlled molecular delivery system. Gold nanoparticles (GNP) are well known as optically active plasmonic materials and also generate the local heating by photothermal conversion effects under resonance conditions. Taken this trait, recently hybrid structures have been broadly introduced for developing advanced delivery carriers integrated with hydrogel network. Here, we present a simple single-step integration method to synthesize plasmonic hybrid nanogels (PHN) composed of thermo-responsive polymers with GNP. The polymer networks integrated with GNP subsequently change their structures for releasing loaded molecules by light illumination. We systemically tune morphological and light-responsive properties by changing the building blocks. Then, we evaluate their capability to control the molecular release kinetics via light-illumination. We envision that the proposed light responsive PHN would be beneficial nanocarriers to improve and understand the controlled drug delivery system more precisely.