

## Supporting Information

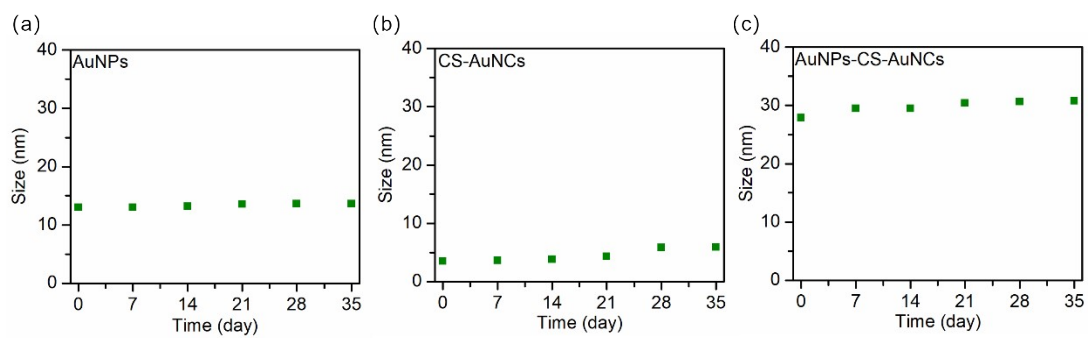
# Design of Nanocomposite with Gold Nanoparticle as Core and Casein Templated Gold Nanocluster as Shell with Ultra-low Protein Corona for Enhanced Photodynamic Therapy

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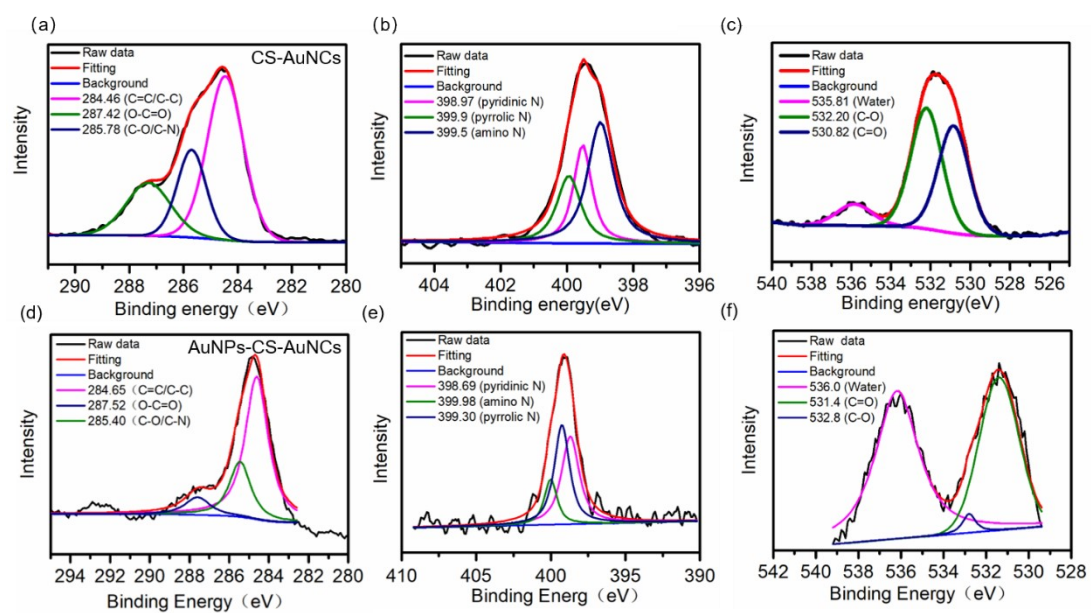
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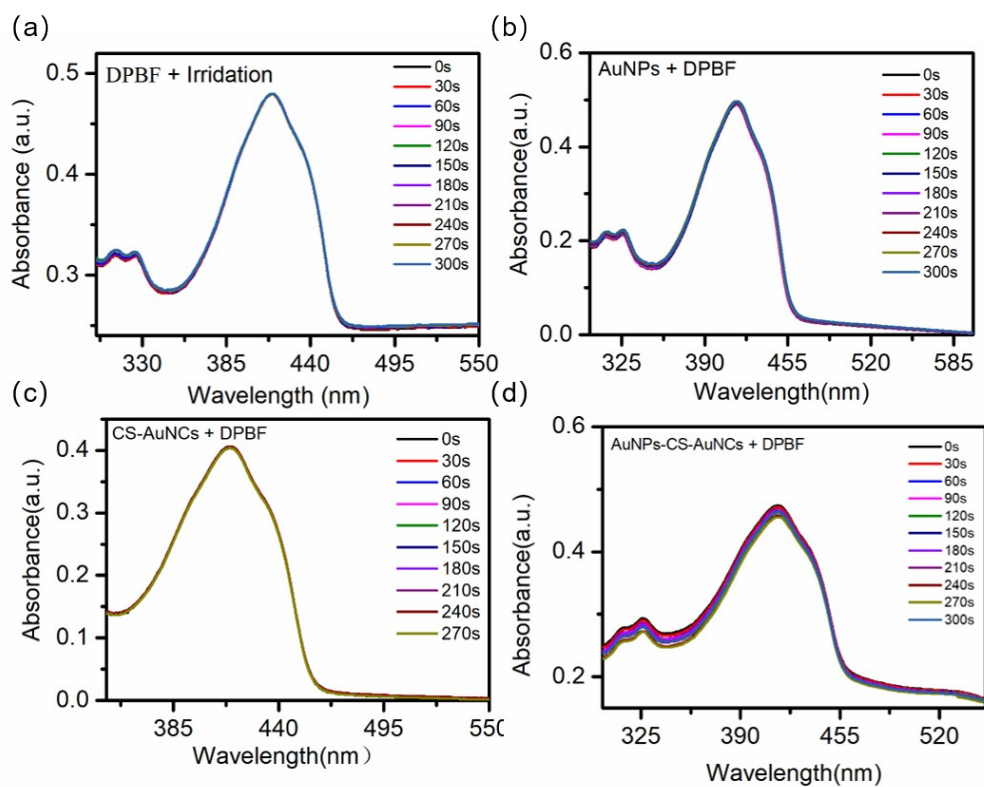
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**Fig. S1** Colloidal stability of three types of gold nanocomposite in DI water.



**Fig. S2** (a) C 1s XPS spectrum, (b) N 1s XPS spectrum and (c) O 1s XPS spectrum of CS-AuNCs. (d) C 1s XPS spectrum, (e) N 1s XPS spectrum and (f) O 1s XPS spectrum of AuNPs-CS-AuNCs.



**Fig. S3** (a) Absorption spectra of DPBF under 390 nm irradiation at different times. Absorption spectra of (b) AuNPs / DPBF mixture, (c) CS-AuNCs / DPBF mixture and (d) AuNPs-CS-AuNCs / DPBF mixture without irradiation.

