

Supplementary information

Berberine mediated fluorescent gold nanoclusters in biomimetic erythrocyte ghosts as a nanocarrier for enhanced photodynamic treatment

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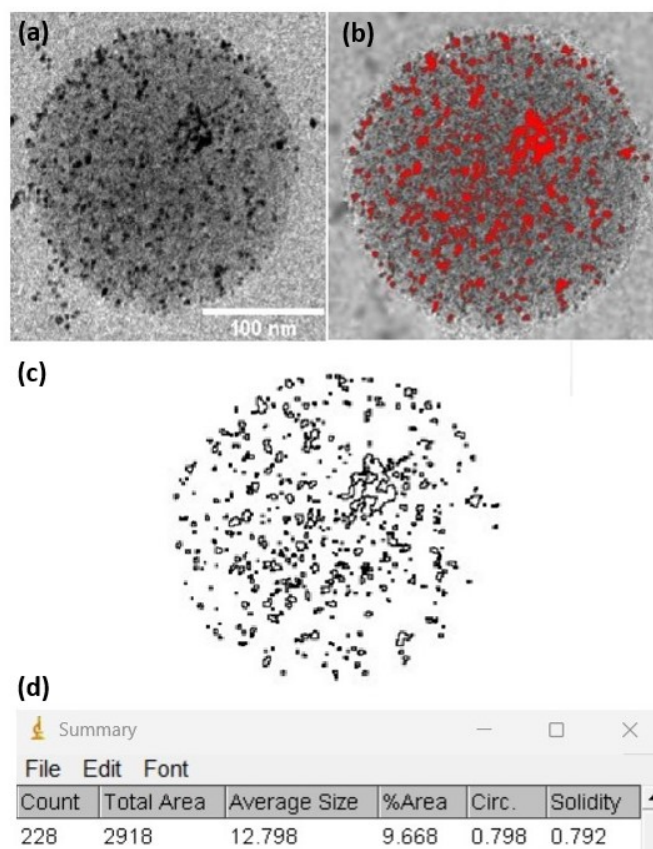


Figure S1 Characterization of AuNC@BBR nanocomposite: (a) HR-TEM image of AuNC@BBR complex. Scale bar represents 100 nm; Quantification with ImageJ (b) thresholding, (c) edge detection, and (d) summary of the quantification.

Table S1 A quantification summary for multiple AuNC@BBR complex using ImageJ Software

| Slice of AuNC@BBR TEM image | Average Size | %Area | Mean | Circ. | Solidity |
|-----------------------------|--------------|--------|--------|-------|----------|
| 1 | 17.574 | 15.116 | 65.194 | 0.726 | 0.753 |
| 2 | 16.752 | 16.371 | 36.346 | 0.711 | 0.746 |
| 3 | 19.222 | 14.074 | 52.772 | 0.725 | 0.756 |
| 4 | 10.762 | 10.098 | 47.723 | 0.846 | 0.798 |
| 5 | 16.875 | 17.352 | 52.96 | 0.849 | 0.845 |
| 6 | 18.946 | 18.523 | 76.592 | 0.867 | 0.883 |
| 7 | 15.527 | 10.651 | 79.338 | 0.891 | 0.911 |

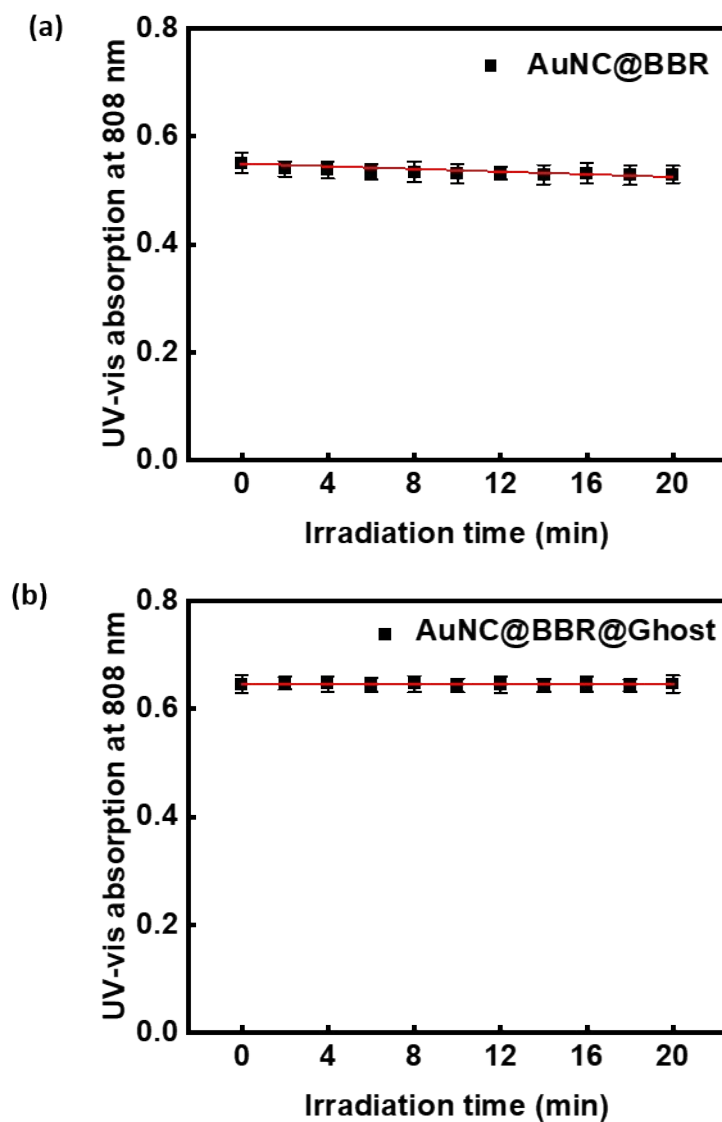


Figure S2 Photostability of (a) AuNC@BBR; and (b) AuNC@BBR@Ghost under 808 nm laser (0.75 W/cm²) irradiation within 20 min by UV-visible absorbance spectra

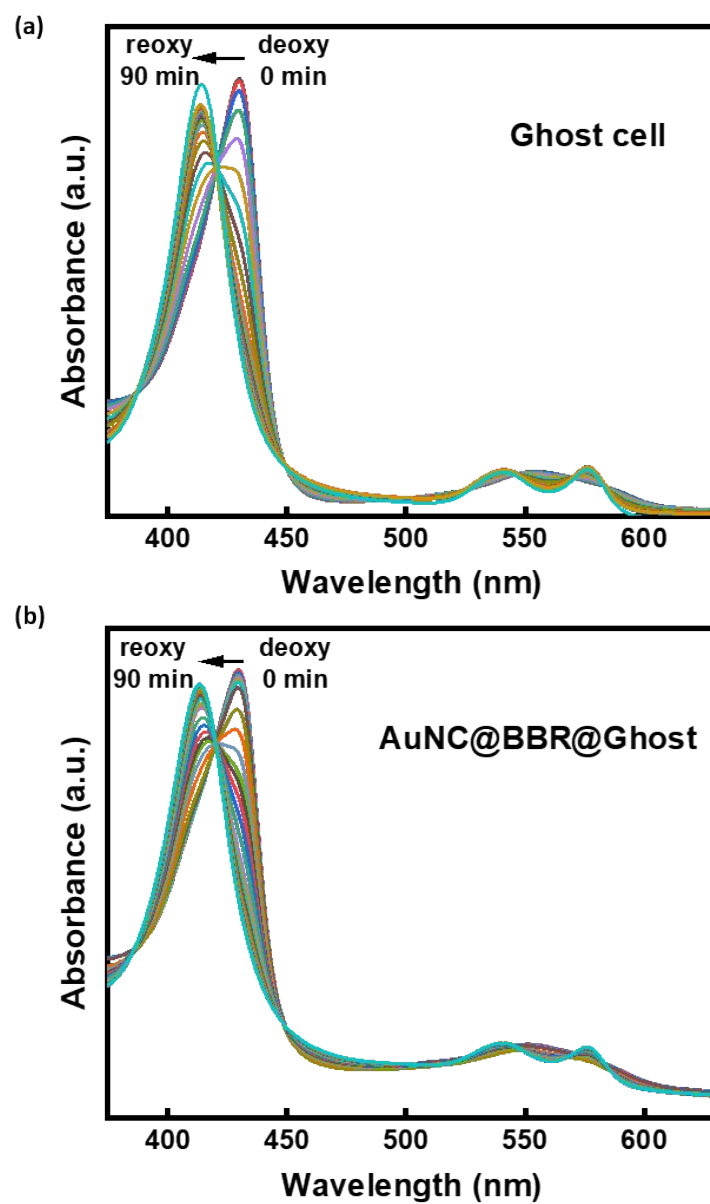


Figure S3 Time-dependent UV-Vis absorbance spectra of (a) Ghost; and (b) AuNC@BBR@Ghost in the deoxygenated and reoxygenated conditions.

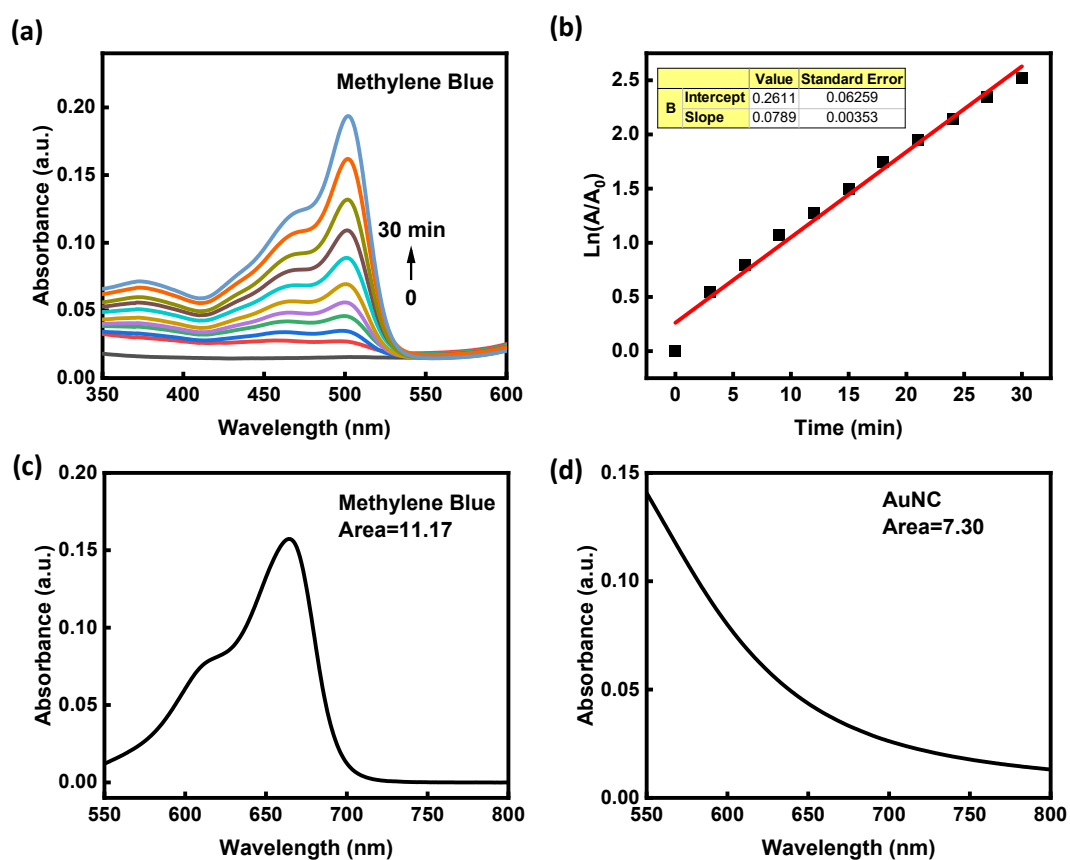


Figure S4 (a) Time-dependent absorbance of DCF at 502 nm caused by methylene blue (MB) under 808 nm laser irradiation; (b) The rate constants for DCF absorbance in the presence of MB; (c & d) The absorption peak area of MB and AuNC respectively.

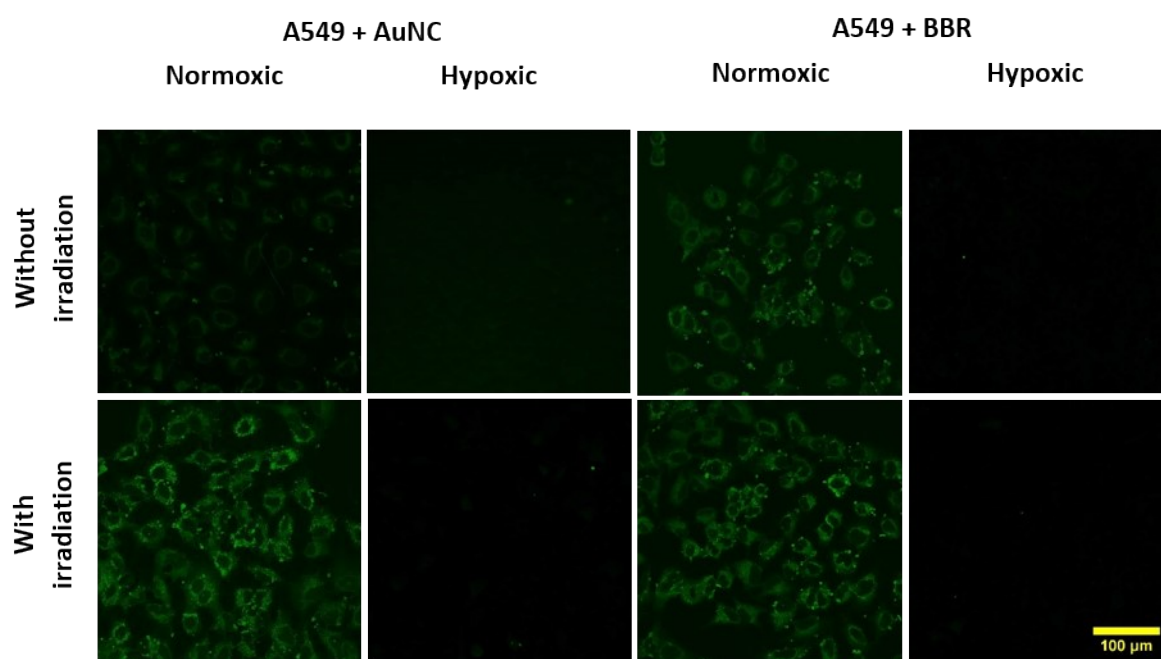


Figure S5 Identification of reactive oxygen species generation in A549 cell line using oxidized DCFDA, observed by fluorescence microscopy (Excitation: 488 nm; Emission: 520-550 nm; Objective: 20x) Scale bar represents 50 μm .

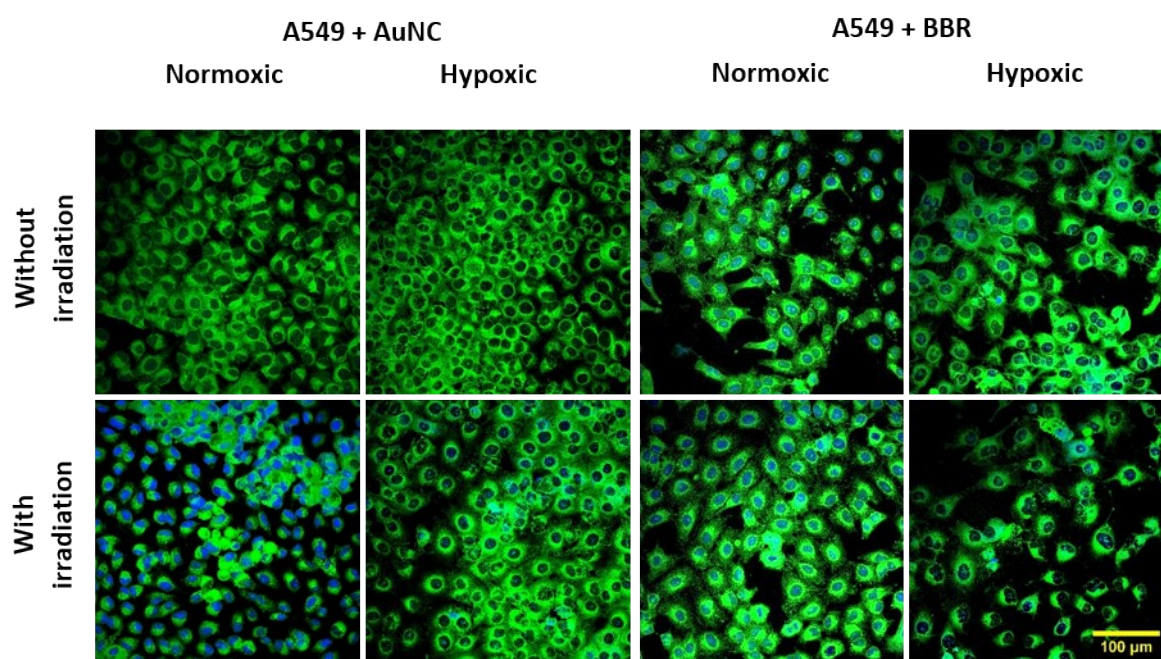


Figure S6 Discrimination of live and dead A549 normoxia and hypoxia cell line using violet fluorescent and DiOC5 staining, observed by confocal fluorescence microscopy (Objective: 20x) Scale bar represents 100 μm .