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Supporting Information

for

Concentration-dependent photothermal conversion efficiency of gold nanoparticles under near-infrared laser and broadband irradiation

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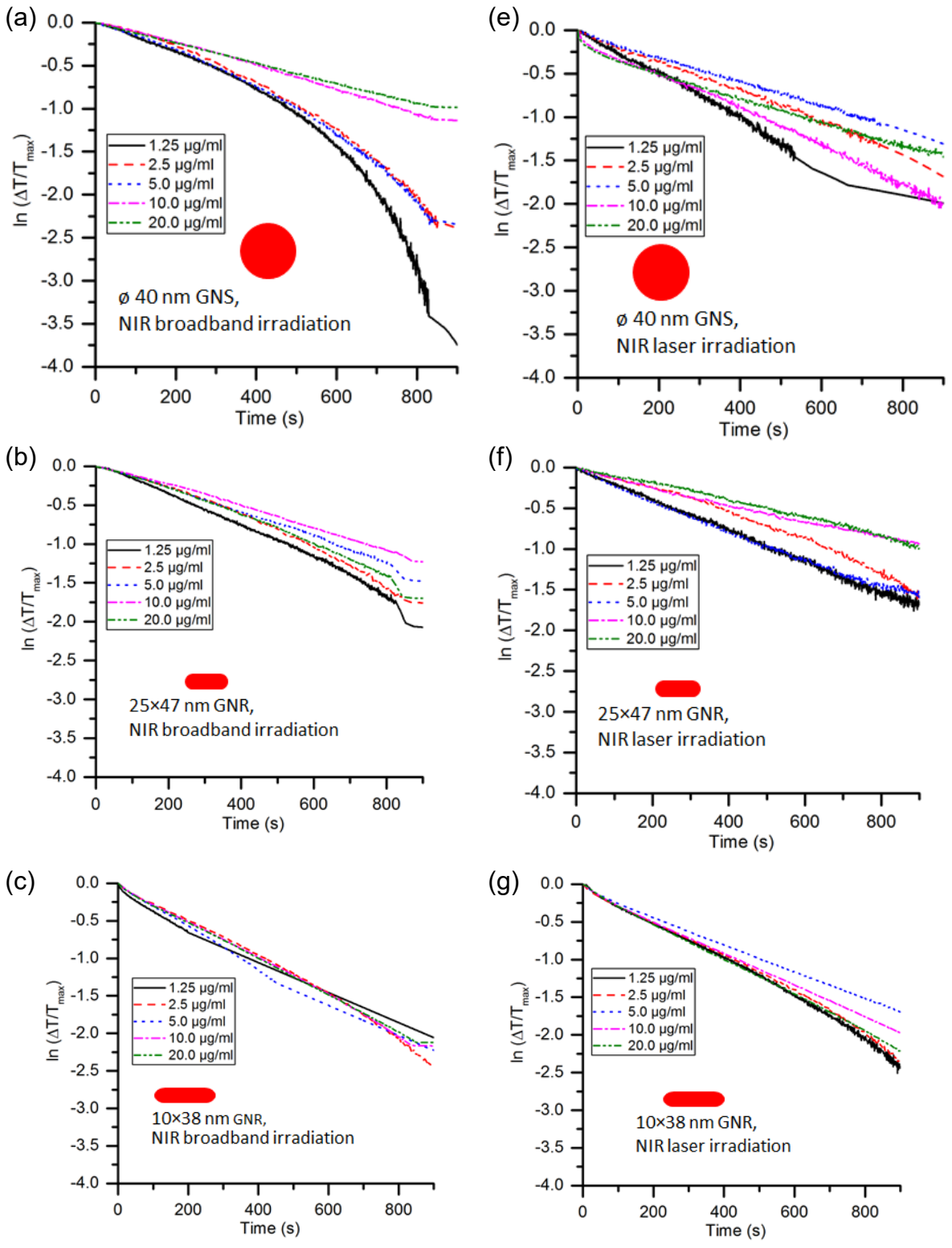
Additional experiemental data

Table S1: Different GNPs used in this study.

GNPs type	Size (nm)	Peak absorption wavelength (nm)	Standard Concentration (µg/ml)	Product no.	Procured from
Gold nanosphere (GNS)	40	529–533	45	741981	Sigma Aldrich, USA
Gold nanorods (GNR)	25×47	600	45	771651	Sigma Aldrich, USA
GNR	10×38	790	38.5	A12-10-780-CTAB-DIH-1-25	Nanopartz, USA
GNR	10×41	806	39	A12-10-808-CTAB-DIH-1-25	Nanopartz, USA


(a)
(e)
(b)
(f)
(c)
(g)
ln (ΔT/T_max)
Time (s)
1.25 μg/ml
2.5 μg/ml
5.0 μg/ml
10.0 μg/ml
20.0 μg/ml
ø 40 nm GNS,
NIR broadband irradiation
ø 40 nm GNS,
NIR laser irradiation
25×47 nm GNR,
NIR broadband irradiation
25×47 nm GNR,
NIR laser irradiation
10×38 nm GNR,
NIR broadband irradiation
10×38 nm GNR,
NIR laser irradiation

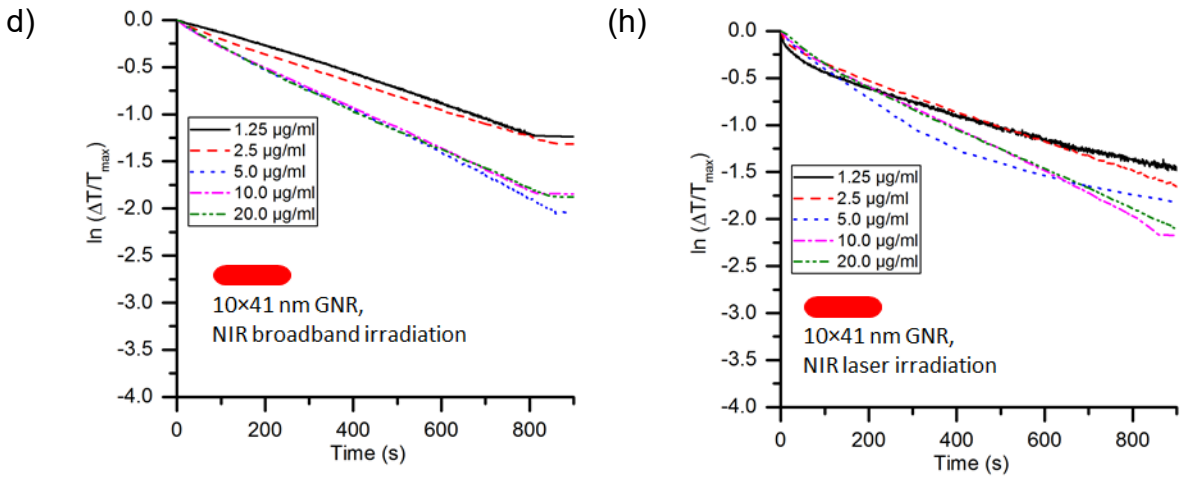


Figure S1: Temporal variation of $\ln(\Delta T/T_{max})$ for calculating the rate constant of heat loss of different nanoparticle concentrations for (a) 40 nm GNSs, (b) 25 × 47 nm GNRs, (c) 10 × 38 nm GNRs, and (d) 10 × 41 nm GNRs under NIR broadband irradiation (754–816 nm), and (e) 40 nm GNSs, (f) 25 × 47 nm GNRs, (g) 10 × 38 nm GNRs, and (h) 10 × 41 nm GNRs under NIR laser irradiation (808 nm).

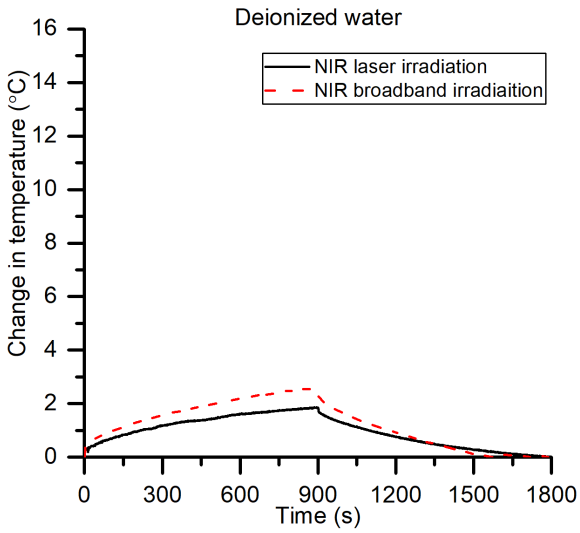


Figure S2: Heating and cooling profiles of deionized water under NIR broadband and NIR laser irradiation.

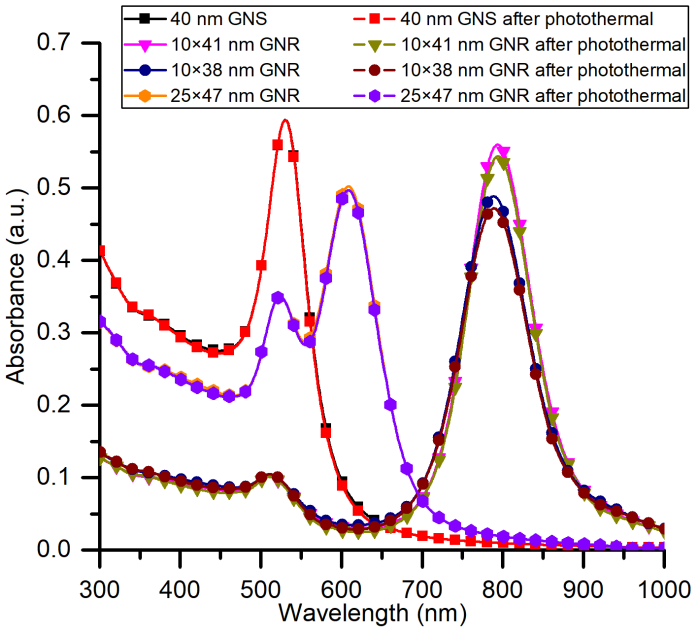


Figure S3: Spectral absorbance, measured using a spectrophotometer, of (a) 40 nm GNSs, (b) 25 × 47 nm GNRs, (c) 10 × 38 nm GNRs, and (d) 10 × 41 nm GNRs before and after irradiation.