Supporting Information

S-nitrosothiols loaded mini-sized Au@silica nanorod elicits collagen depletion and mitochondrial damage in solid tumor treatment

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Figure S1. Standard curve of NaNO₂ standard samples (0-100 μM).
Figure S2. FTIR spectra of GSN (black), GSP (red), GSNP (blue) and GSNP-TPP (green).
**Figure S3.** EDS spectra of GSNP-TPP.
Figure S4. Elemental mapping analysis of S and N in GSNP-TPP.
**Figure S5.** Confocal microscopy images of HeLa cells treated with saline, GSNPs and GSNP-TPPs. GSNPs and GSNP-TPPs were labeled with ZnPc and emitted red fluorescence. Mitochondria were stained by 50 nM Mito-Tracker Green and emitted green fluorescence. Scale bar indicated 25 µm.
Figure S6. Statistical assay of JC-1 monomer/aggregate ratio shown in Figure 4G. I, II, III were indicated saline, GSP-TPPs+laser and GSNP-TPPs+laser, respectively. (n=3, *p < 0.05)
Figure S7. A) Cell viability of HeLa, 4T-1 and MCF-7 cells after treatment with various concentrations (0, 25, 50, 100 and 200 μg/mL). B) Cell viability of H9c2 cells after treatment with various concentrations (0, 5, 12.5, 25, 50, 100 and 200 μg/mL). C) Cell viability of HeLa cells after treatment with various
concentrations (0, 25, 50, 100 and 200 μg/mL). (n=3, **p < 0.01)
**Figure S8.** In vitro hemolysis assay of GSNP-TPPs. Inset: hemolysis photos after centrifugation.
**Figure S9.** A-D, F) Statistical assay of p53, Bax, Bcl-2, Cleaved Caspase-3 and HSP90 contents according to their result of western blot. (n=3, **p < 0.01)

E) Western blot of HSP90 with different treatment: I Control, II GSPs+laser, III GSNP-TPPs+laser.
Figure S10. Quantitative comparison of the green fluorescence intensity shown in Figure 4H. (n=3, *p < 0.05)
Figure S11. In vivo CT images of HeLa tumor-bearing mice after i.v. injection of iopromide solution at different times (0, 1, 2, 6, 12, 24 h).
Figure S12. Represents the tumor weights in control (saline) and treatment (GSNP-TPPs+laser) groups after removal of the tumor from animals. Each point represents the weight of each tumor and the lines represent the mean value. “*” denotes statistical difference (**p < 0.01).
Figure S13. TUNEL assay, immunohistochemical and immunofluorescent staining of tumor sections from GSP-TPPs+laser and GSNP-TPPs+uric acid+laser groups. Immunohistochemical staining for MMP-1, MMP-2 and 3-NT proteins. Immunofluorescent staining for Collagen I and 3-NT.
Figure S14. Quantification of the percentage of apoptotic cells in the TUNEL assay in Figure 7 and S13. I Control, II GSP-TPPs+laser, III GSNP-TPPs+laser, IV GSNP-TPPs+uric acid+laser. (n=5, **p < 0.01)
**Figure S15.** Immunohistochemical staining of tumor tissues for HSP90 and Ki67 proteins.
**Table S1.** The brand, catalog number and the dilution for each antibody used in western blotting

| Antibody            | Brand   | Catalog number | Dilution |
|---------------------|---------|----------------|----------|
| p53                 | Solarbio| K101293P       | 1: 500   |
| Bcl-2               | Solarbio| K003505P       | 1: 1000  |
| Bax                 | Solarbio| K001593P       | 1: 1200  |
| Cleaved Caspase-3   | SAB     | 29034          | 1: 1200  |
| HSP90               | Solarbio| K106929P       | 1: 500   |
| MMP-1               | Solarbio| K000342P       | 1: 500   |
| MMP-2               | Solarbio| K101302P       | 1: 500   |
| GAPDH               | Solarbio| K200057M       | 1: 1000  |