SUPPLEMENTARY MATERIALS

Photoacoustic Ovarian Tumor Imaging using Copper Sulfide Nanodisk and Nanoprism

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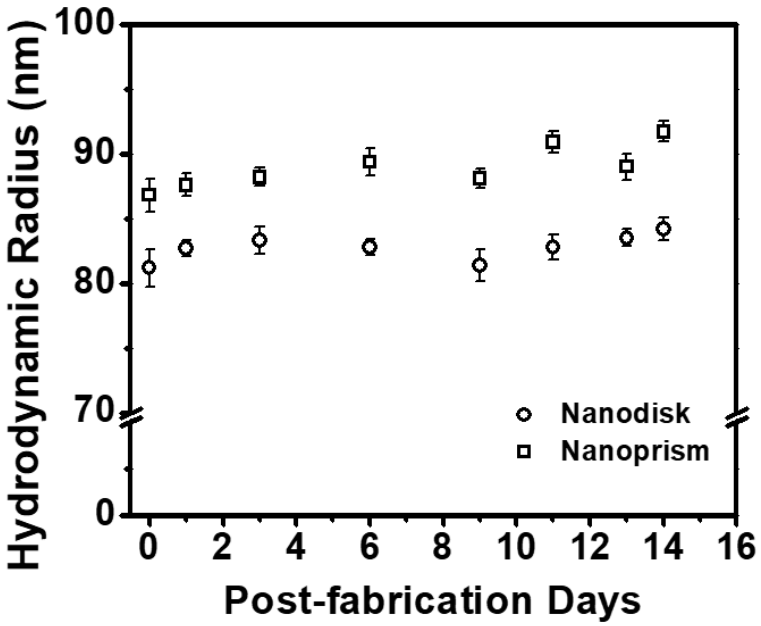
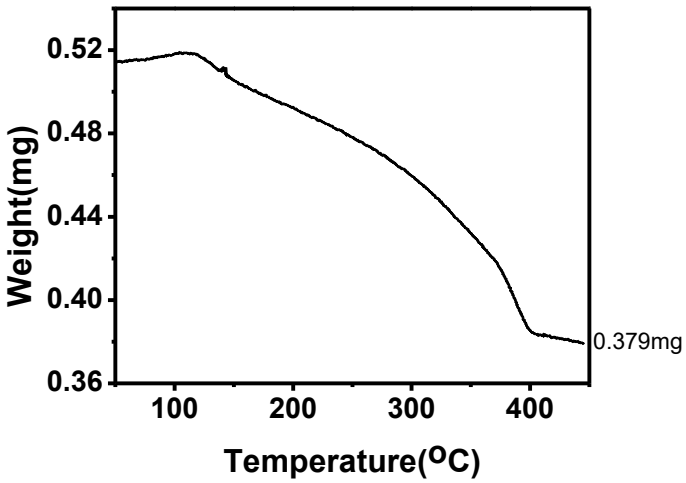
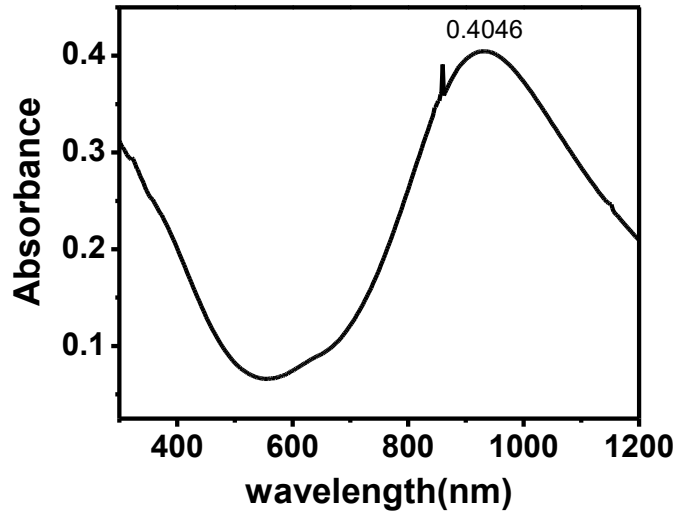


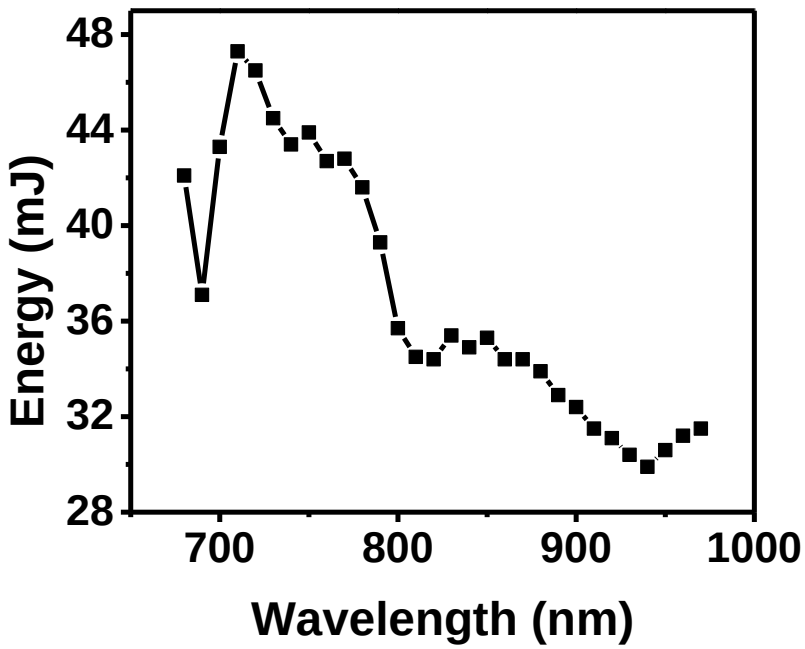
Supplementary Figure S1: Colloidal stability of CuS nanodisk and nanoprism in PBS. PEGylated nanodisks and nanoprisms were stable in phosphate buffered saline (PBS) for at least 2 weeks.



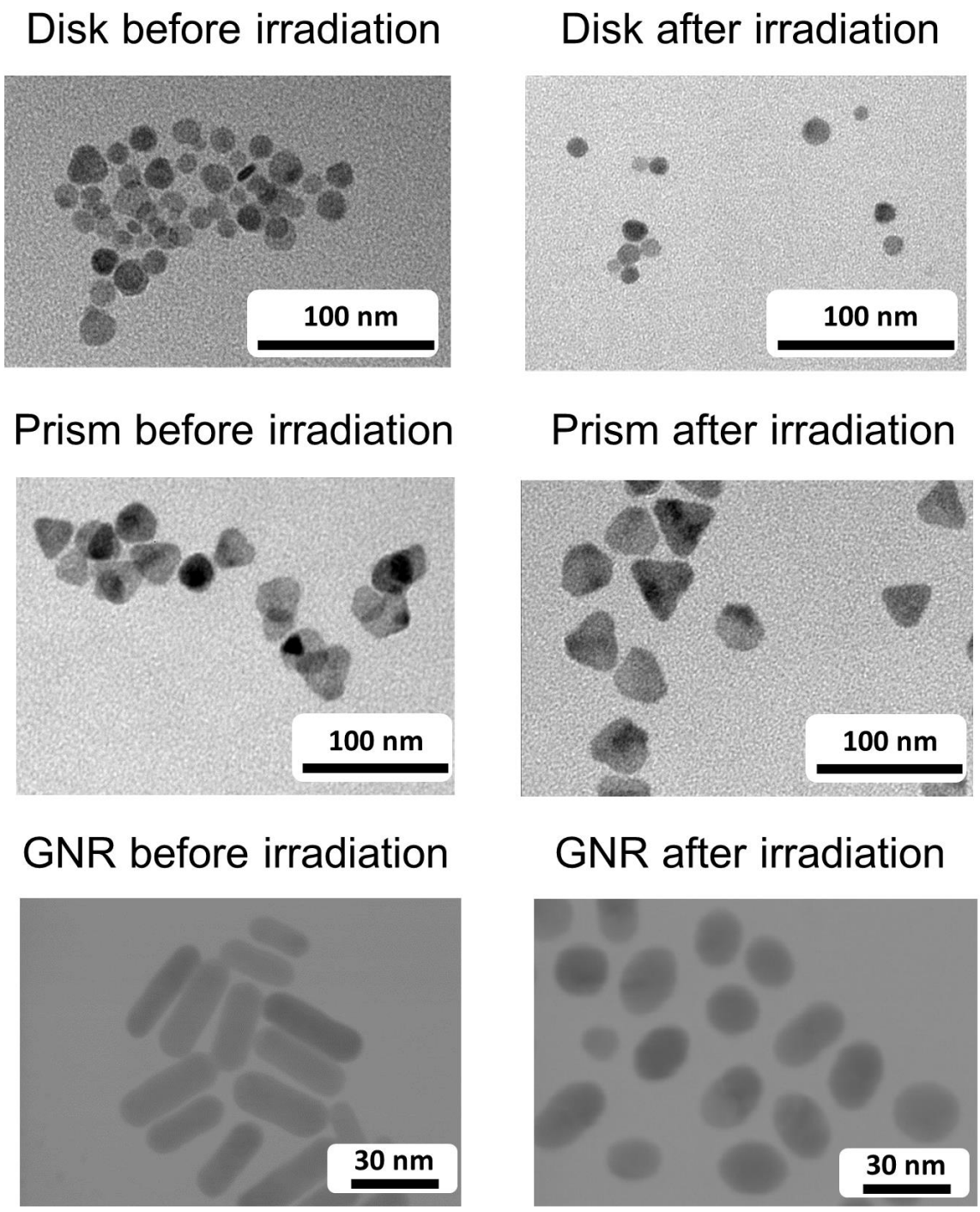
Supplementary Figure S2: Thermal gravimetric analysis (TGA) measurement of CuS nanodisk. The TGA estimated the weight of solid material in the colloidal solution after removal of the ligand and the solvent. The weight of the CuS nanoparticle sample decreased from 0.513 to 0.379 mg when the evaporation temperature increased to 400^{o}C.



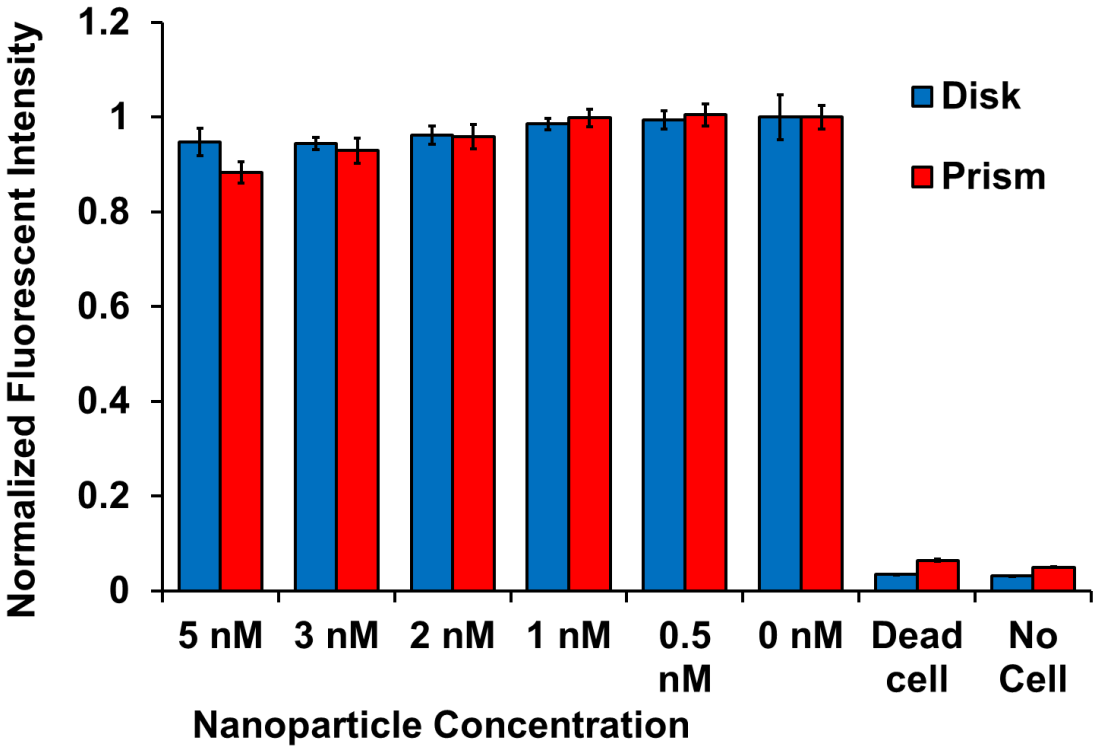
Supplementary Figure S3. Extinction spectrum of CuS nanodisk colloidal solution. The peak absorbance intensity of the 200 times diluted TGA sample occurred was 0.4046.



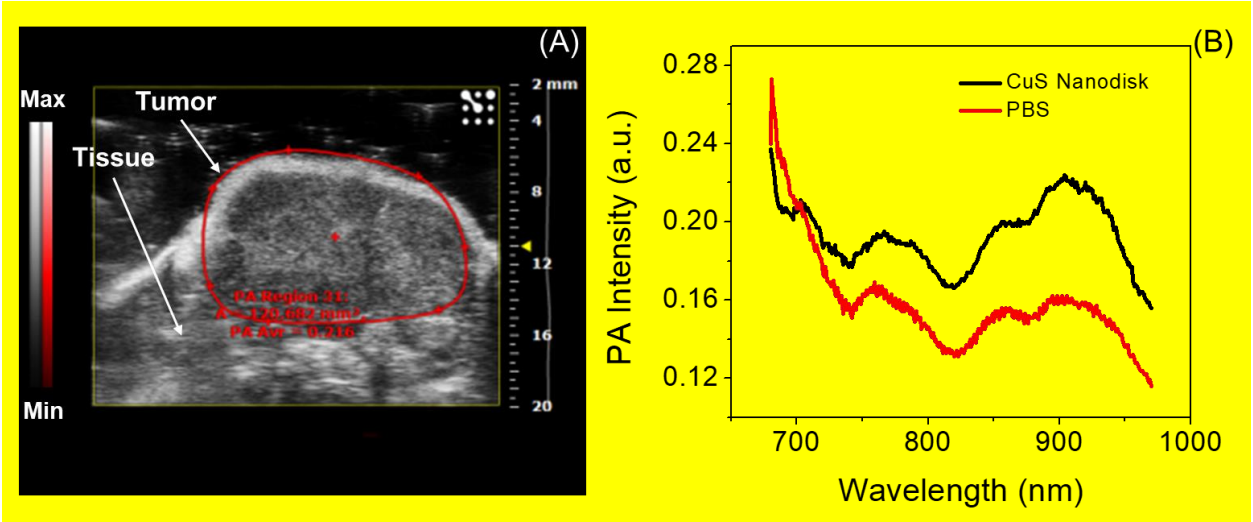
Supplementary Figure S4. Laser output energy as a function of wavelength. The energy of the laser decreases from 47.3 mJ at 710 nm to 31.5 mJ at 970 nm.



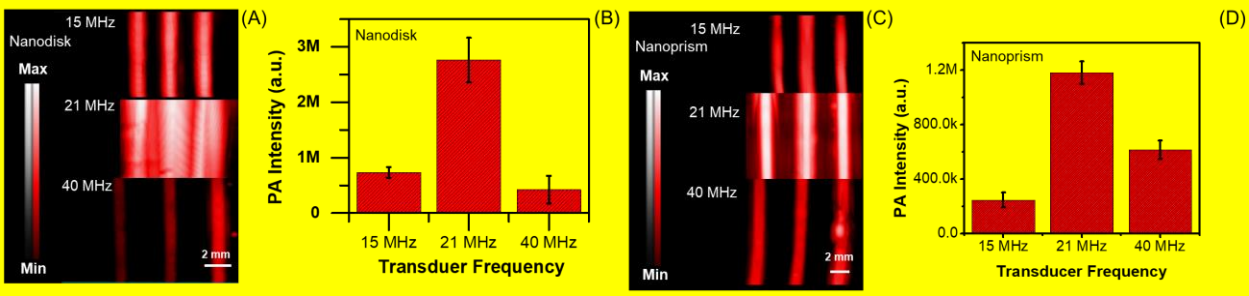
Supplementary Figure S5: Structural stability characterization of gold nanorod, CuS nanodisk, and CuS nanoprism after laser irradiation. The structure of CuS nanodisk and nanoprism remained intact after being irradiated at 940 nm for 14 minutes, while the laser irradiation at 710 nm caused structural deformation on gold nanorod (GNR).



Supplementary Figure S6. Cytotoxicity test of CuS nanodisk and nanoprism. The fluorescent intensity indicated that the viability of the OV2008 cancer cell was higher than 95% and 88% after incubating with 5 nM nanodisk and nanoprism for 24 hours, respectively. “Dead cell” and “No cell” indicate cells treated with 10% CTAB and an empty well, respectively.



Supplementary Figure S7: *in vivo* photoacoustic characterization of a subcutaneous ovarian tumor from a mouse that was intravenously treated with CuS and PBS. Panel A is the ultrasound image of an ovarian tumor in mouse showing the tumor and surrounding tissue based on differences in acoustic impedance. This same animal was intravenously injected with 200 µL of 50 nM CuS. The photoacoustic spectrum of the region of interest shows a characteristic peak at 920 nm, which is not present in the spectrum of the control tumor from the mouse treated with PBS.



Supplementary Figure S8: Photoacoustic intensity of CuS nanodisks and nanoprisms with transducers of different center frequencies. Panel A is the photoacoustic images of three replicate CuS nanodisk samples acquired by LZ201 (center frequency=15 MHz), LZ250 (center frequency=21 MHz), and LZ550 (center frequency=40 MHz). The quantitative analysis of the photoacoustic intensity is shown in panel B. The photoacoustic image and data analysis of CuS nanpoprism acquired under the same experimental conditions are shown in panel C and panel D, respectively.