Supporting Information

Photothermal Modulated Reversible Volume Transition of Wireless Hydrogel Embedded with Redox-responsive Carbon Dot

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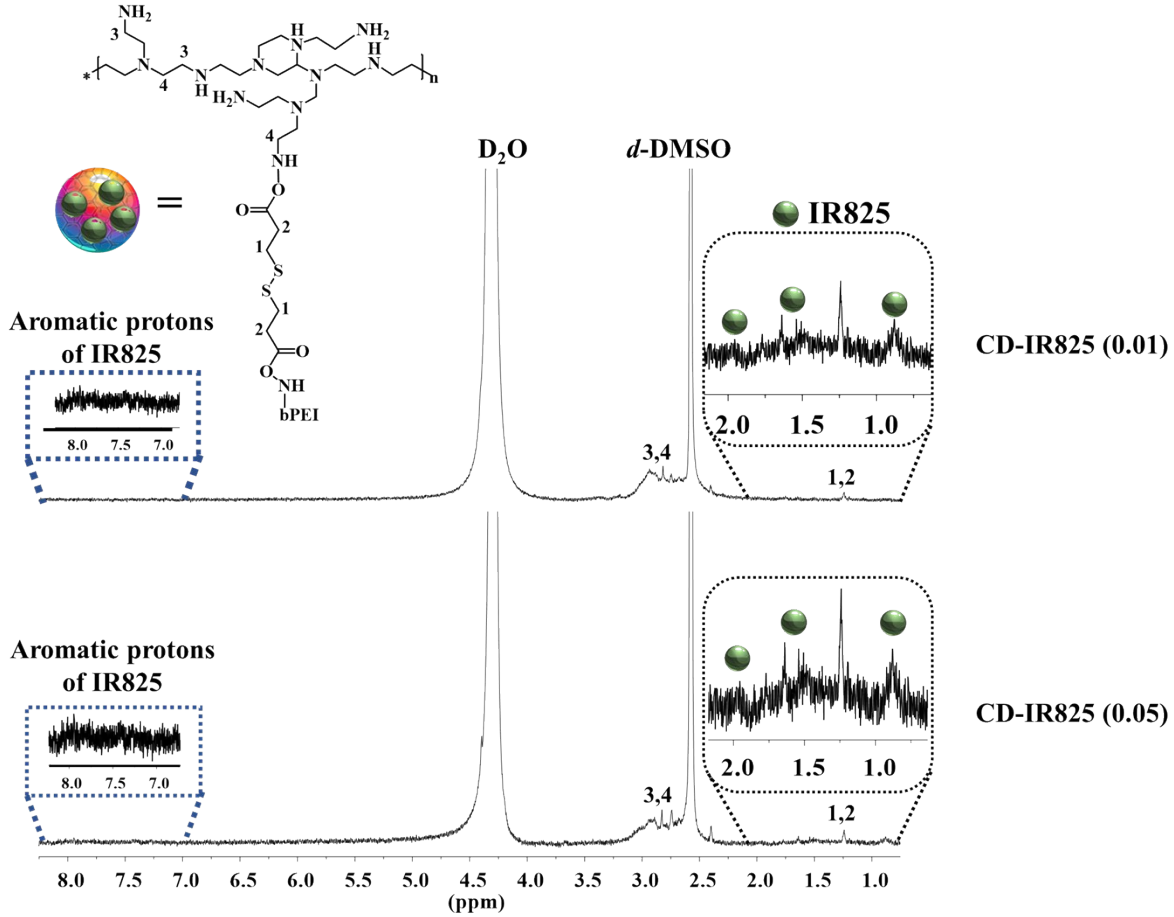

Figure S1 ^{1}H-NMR spectra of the CD-IR825 (0.01) and CD-IR825 (0.05) nanoparticles in co-solvents of D_2O: *d*-DMSO (3:7, v/v ratio).

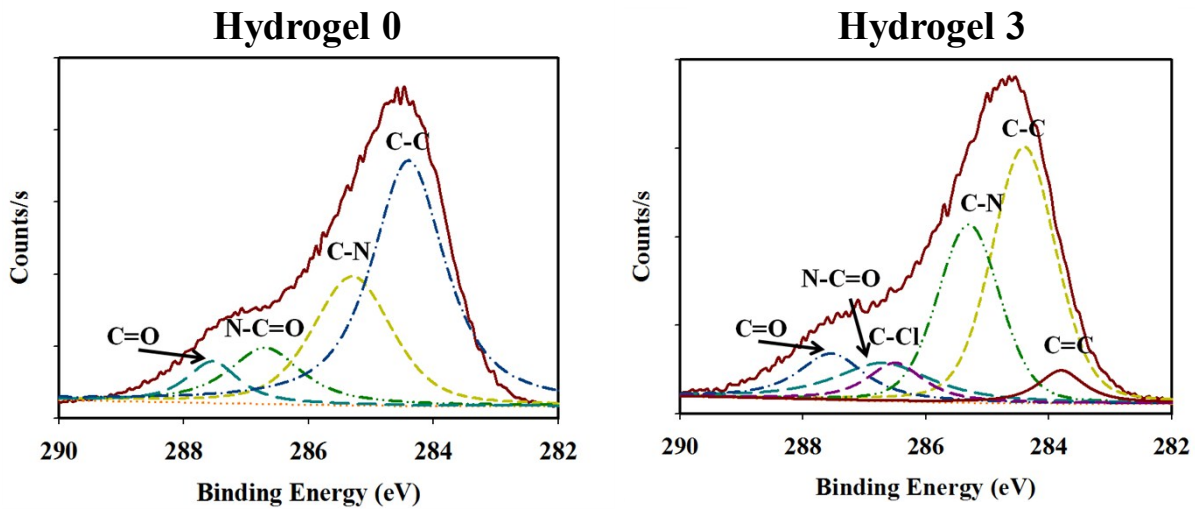

Figure S2 XPS spectra of the composite hydrogel before (Hydrogel 0) and after (Hydrogel 3) loading of the CD-IR825 (0.25) nanoparticles.

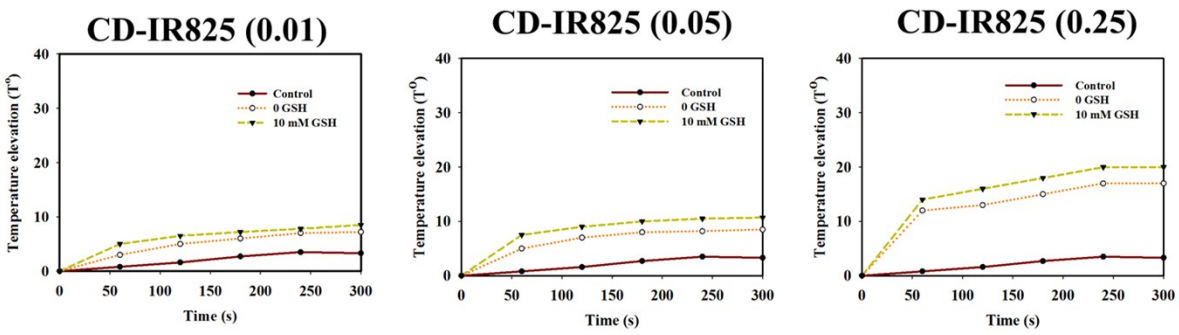

Figure S3 Temperature elevation curve of the CD-IR825 nanoparticles (0.01, 0.05, and 0.25, respectively) with and without GSH treatment (concentration: 1 mg/mL).

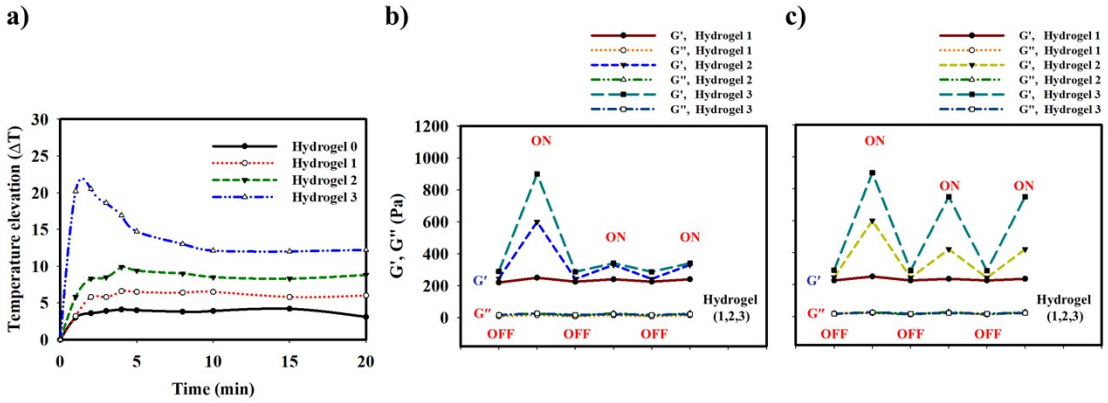

Figure S4 (a) Photothermal temperature elevation curve of Hydrogel 1, Hydrogel 2, and Hydrogel 3 during 20 min NIR irradiation. Reversibility of modulus of hydrogels under on-off-on NIR irradiation (b) before and c) after spraying.

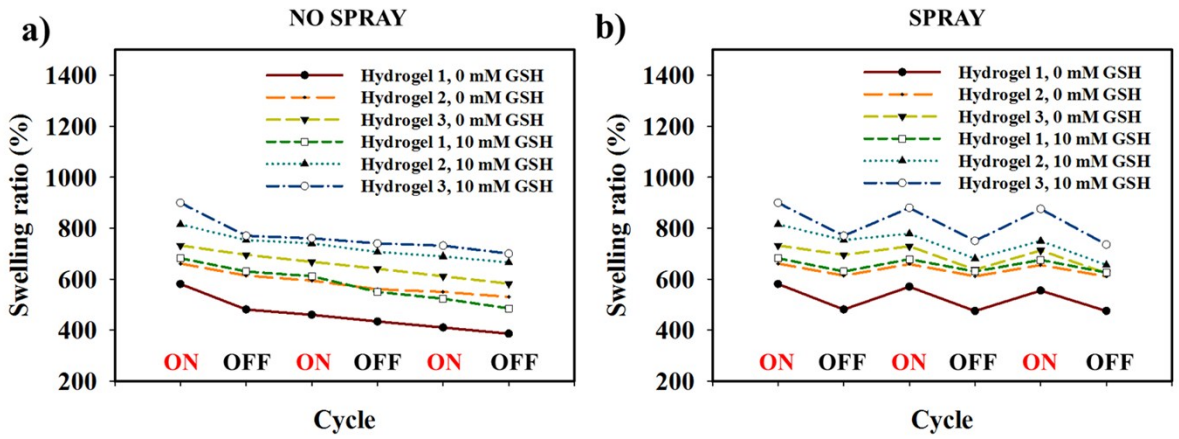

Figure S5 Swelling ratios of the composite hydrogels depending on redox treatment (0 and 10 mM GSH) after on-off-on NIR irradiation (a) without water spray and (b) with water spray.

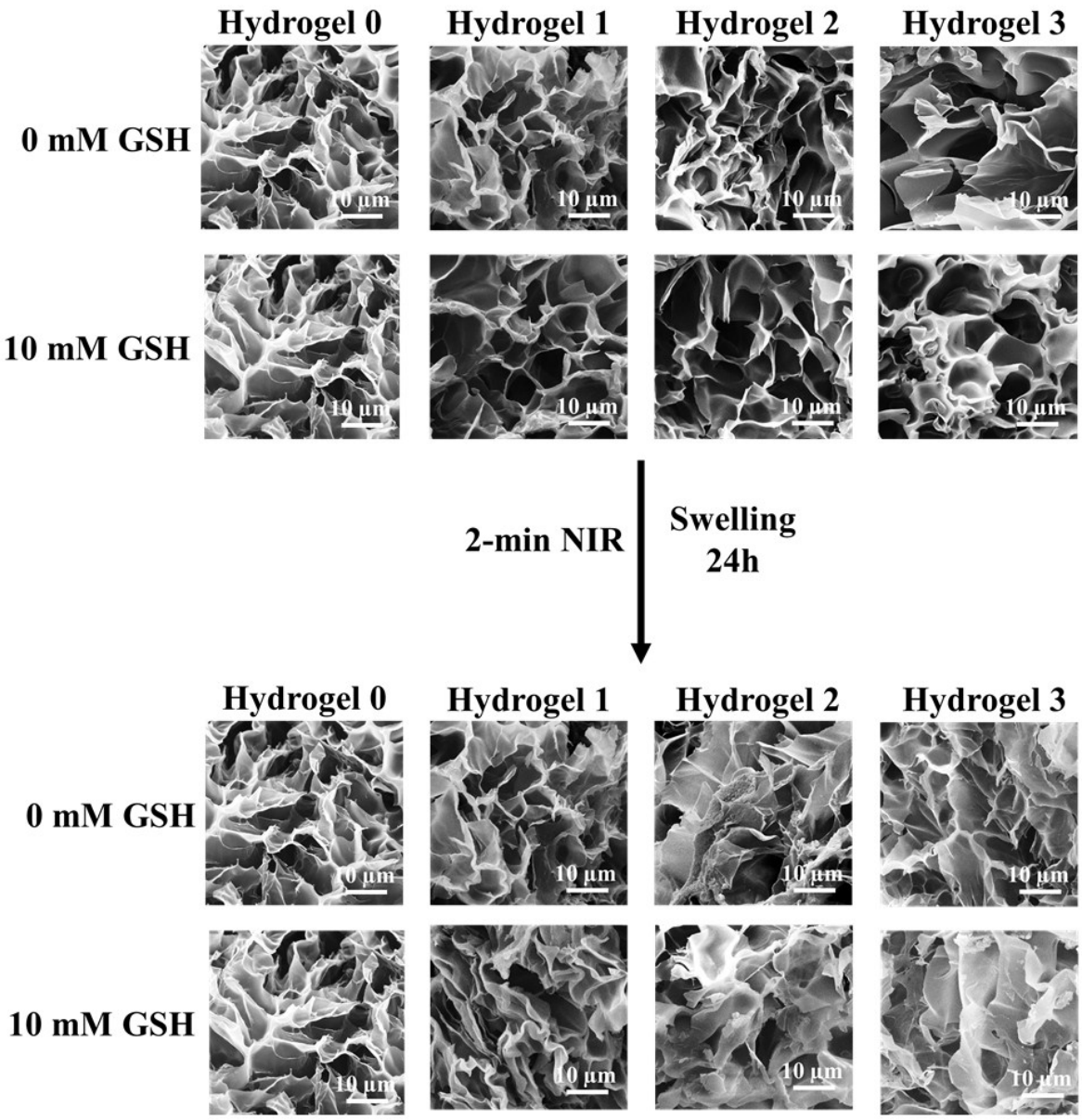

Figure S6 SEM images of the composite hydrogels (Hydrogel 0, 1, 2, and 3) continuing swelling in PBS (0 and 10 mM GSH solutions) before and after NIR irradiation (2 min, 808 nm laser, 2 W/cm^{-1})

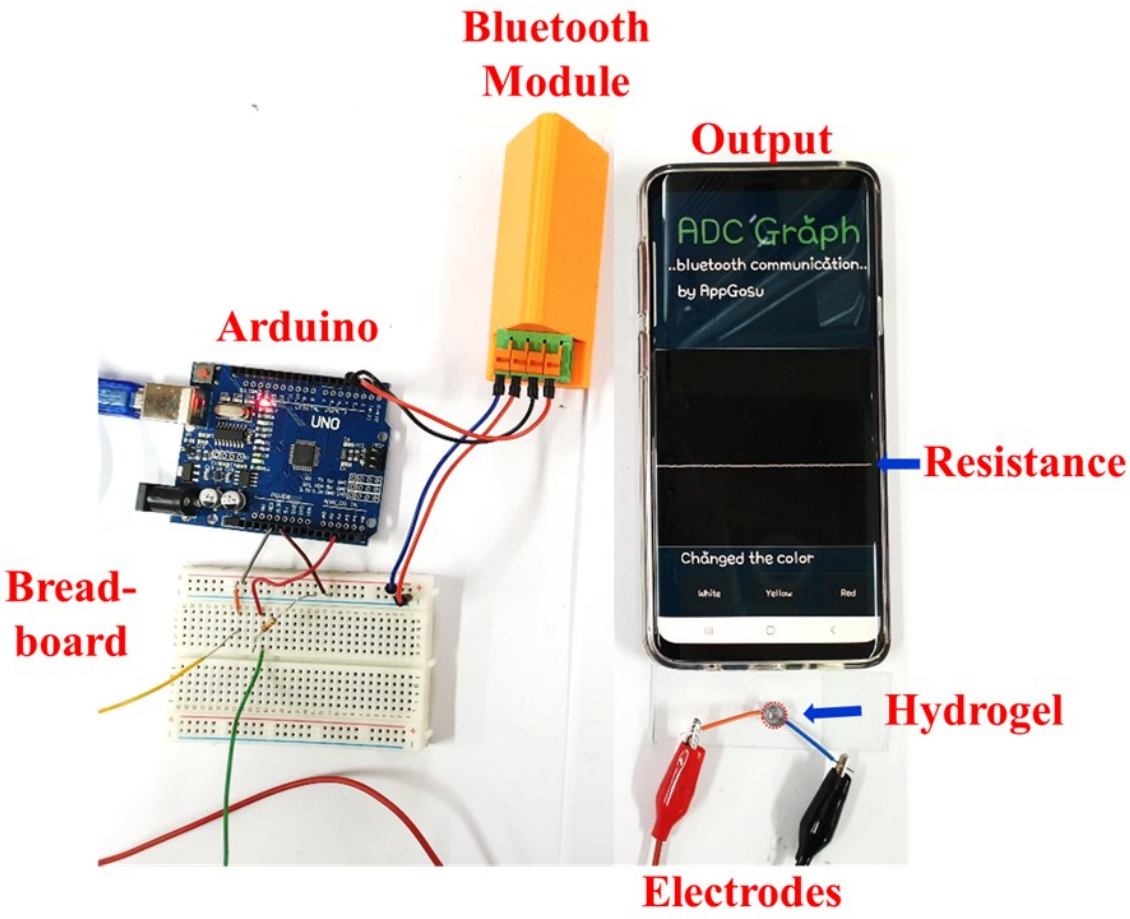

Figure S7 Photograph of the system for wireless hydrogel performance under GSH and NIR irradiation stimuli