



Supplementary Materials

Red-emitting SBBF (Single-benzene-based fluorophore)-Silica Hybrid Material: One-pot Synthesis, Characterization, and Bio-medical Applications

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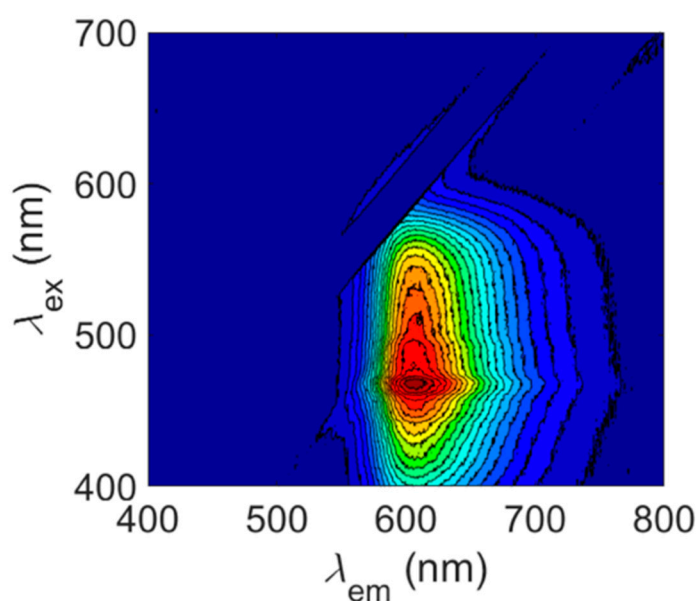


Figure S1. 2D photoluminescence excitation (PLE) spectrum (λ_{ex} : 400–700 nm) of **c-SSH**. X-axis: emission, Y-axis: excitation. Intensity: red (strong), blue (weak).

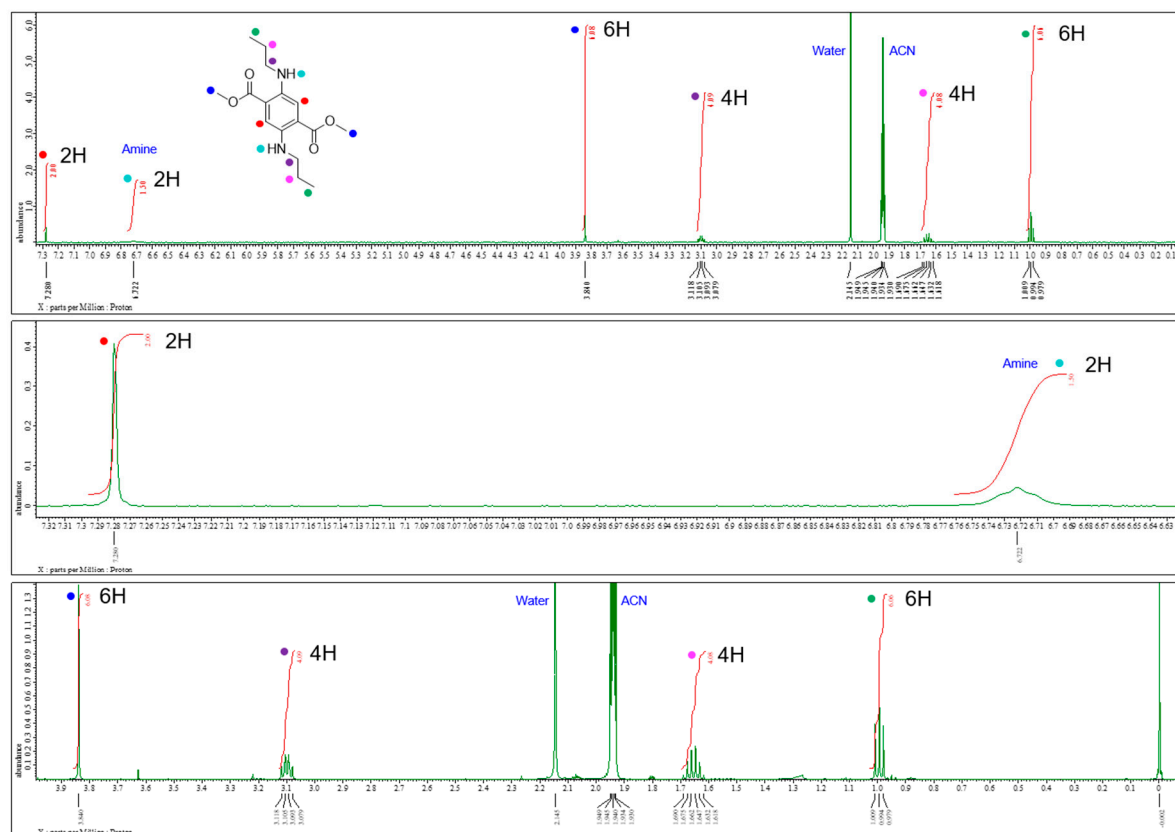


Figure S2. ^1H NMR of DCD-propyl. NMR solvent: Acetonitrile- d_3 .

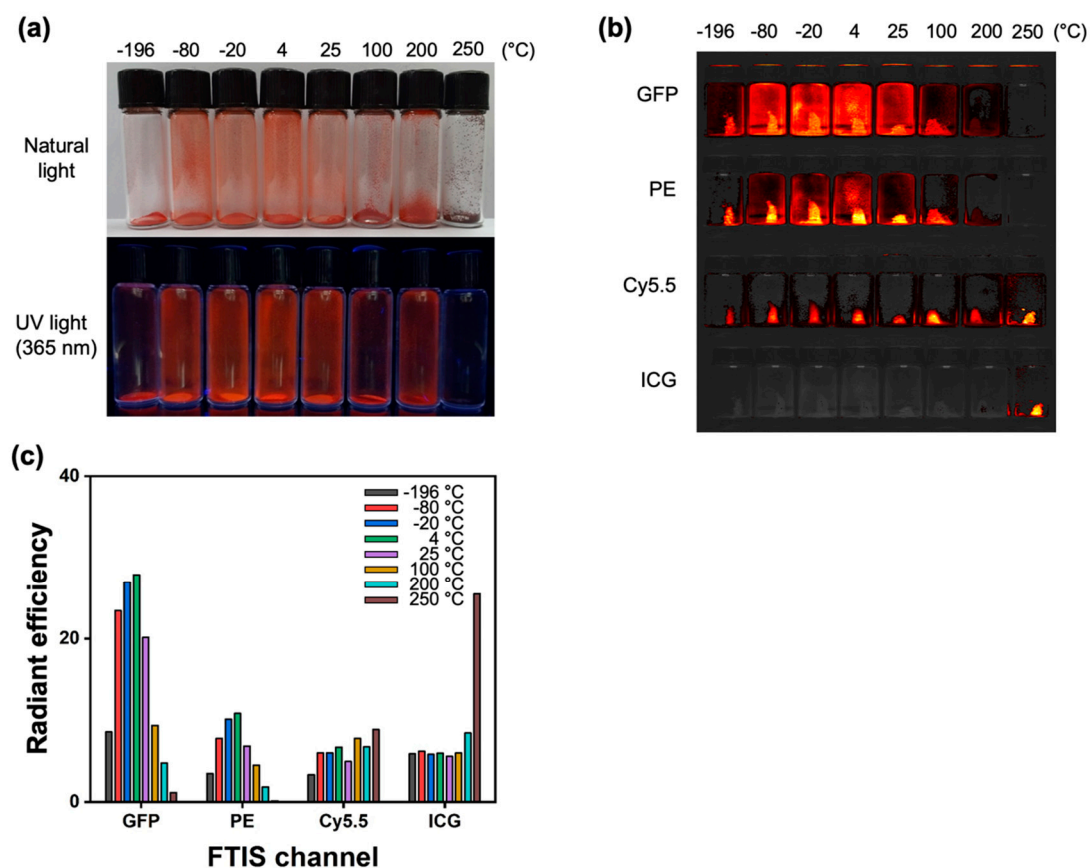


Figure S3. (a) Photos of the glass vial containing **c-SSH** at different temperatures under natural light (top) and UV light (365 nm, down). (b) FTIS images of the vials containing **c-SSH** at different temperatures and emission channels. Excitation and emission channel: GFP (390–490 nm, 500–550 nm), PE (530–570 nm, 575–640 nm), Cy5.5 (620–650 nm, 690–740 nm), and ICG (740–790 nm, 810–860 nm). (c) Radiant efficiency plot from panel (b). Heat exposure time: 10 min.

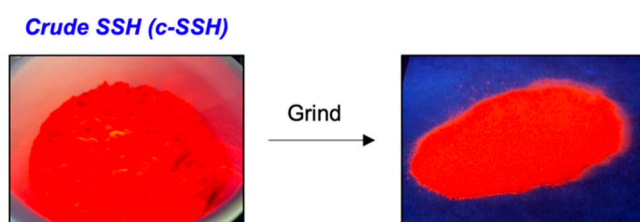


Figure S4. Photos of the first step of the **n-SSH** preparation. (left) Photos of **c-SSH** and (right) ground **c-SSH** under UV light (365 nm).

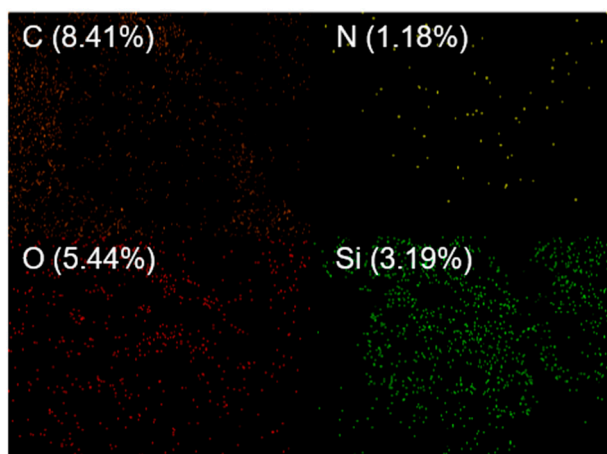


Figure S5. Energy-dispersive X-ray spectroscopy (EDS) element mapping images of **n-SSH** (C: 8.41%; N: 1.18%; O: 5.44%; Si: 3.19%).

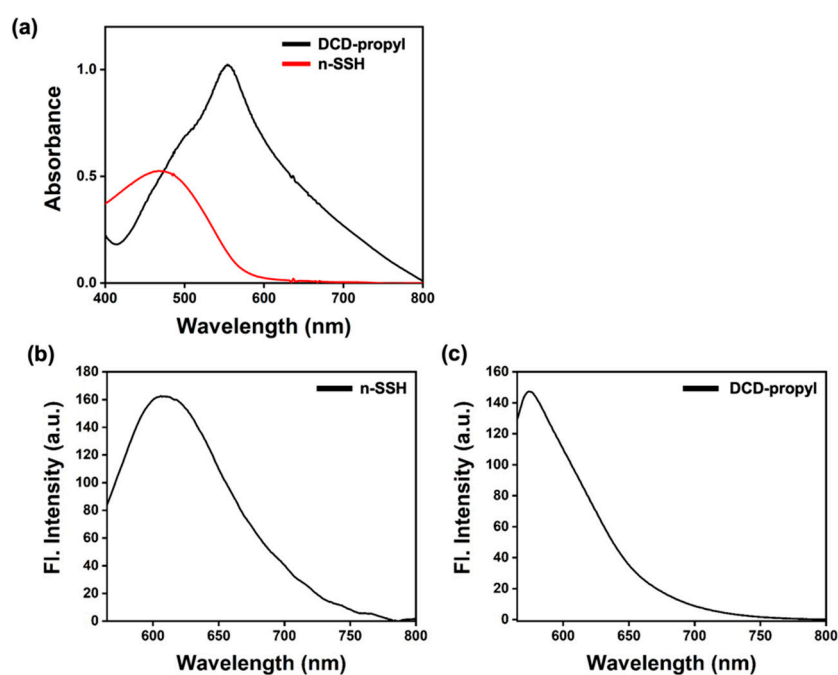


Figure S6. (a) UV/vis absorption and emission spectra of (b) **n-SSH** (1 mg/mL) in DI.H₂O (5% acetonitrile) and (c) emission spectra of **DCD-propyl** (3 mM) in DI.H₂O (5% acetonitrile). Excitation wavelength: 554 nm.

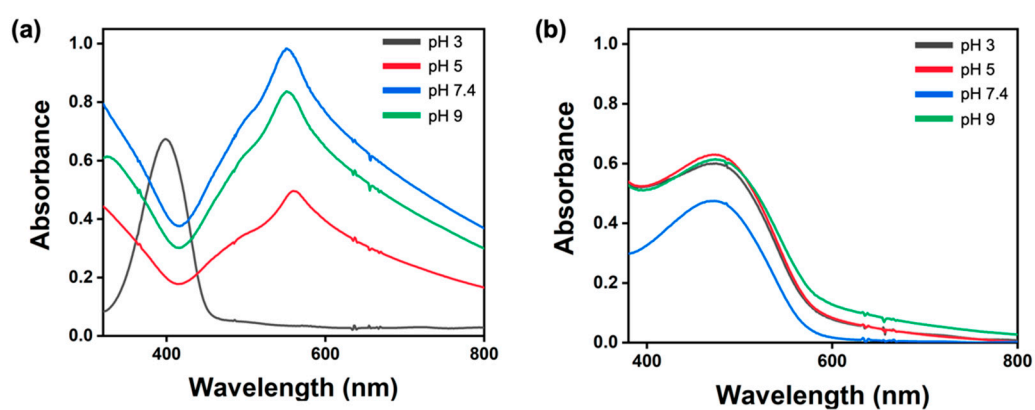


Figure S7. Absorption spectra of (a) DCD-propyl (3 mM) and (b) n-SSH (1 mg/mL) in various pH buffers (3, 5, 7.4, 9) at 25 °C.

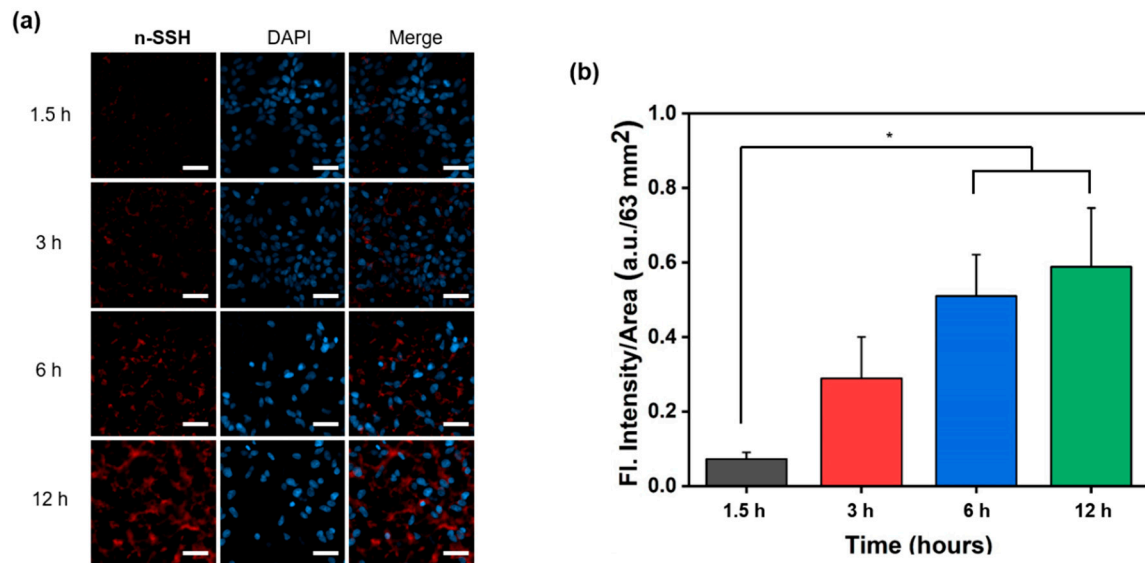


Figure S8. (a) CLSM images of HEK293 cells after being treated with n-SSH (10 mg/mL) and incubated for 1.5–12 h at 37 °C. Scale bar: 100 μm. Excitation and emission channel: red (561 nm, 576–700 nm), blue (405 nm, 410–450 nm). SA-free media was used for the incubation. (b) Fluorescence intensity plot from panel (a) (63 mm² areas in merge image) at given incubation time points. The data are shown as the mean ± S.E.M. *p<0.05.

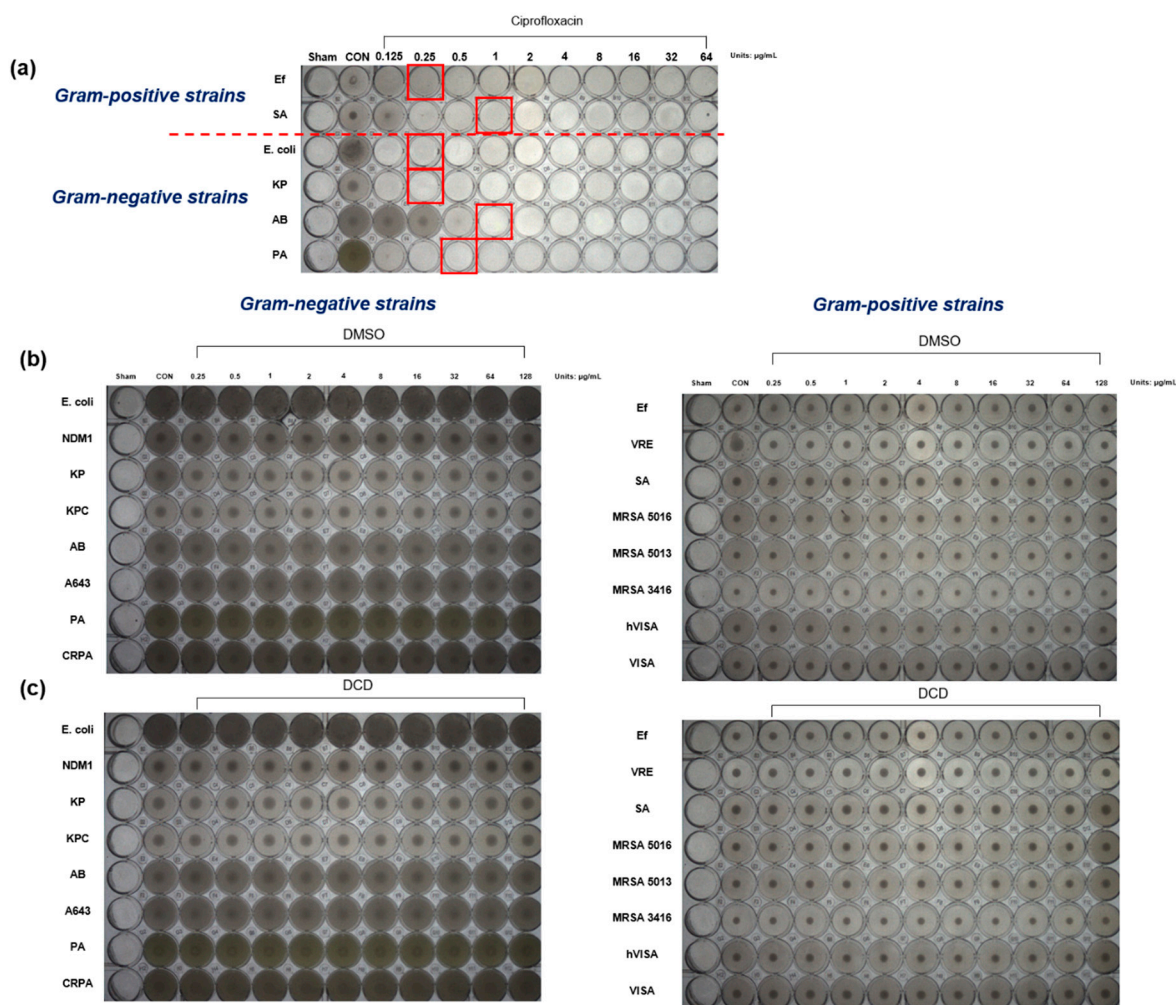


Figure S9. (a) MIC assay results of (a) ciprofloxacin (control) against 6 types of bacteria strains. Ciprofloxacin was serially diluted two-fold in a 96-well round-bottom microplate at different concentration ranges from 0.125 to 64 $\mu\text{g/mL}$. (b) MIC assay results of DMSO (control) and (c) DCD against 16 types of bacteria strains. DMSO and DCD were serially diluted two-fold in a 96-well round-bottom microplate at different concentration ranges from 0.25 to 128 $\mu\text{g/mL}$.