Supporting Information

Lanthanide Based White-Light-Emitting Hydrogel Mediated by Fluorescein and Carbon Dots with High Quantum Yield and Multi-stimuli Responsiveness

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Figure S1. TEM and HRTEM (inserted) images of CDs.

Figure S2. PXRD pattern of Eu$^{3+}$-C complex.

Figure S3. FTIR spectra of Eu$^{3+}$-C complex and Eu$^{3+}$-C/FITC/CDs hydrogel.
**Figure S4.** Fluorescence emission spectra of WLE hydrogel in solution and gel states.

**Figure S5.** Fluorescent decay curves of Eu$^{3+}$-C and CDs in the absence (A, B) and presence (C, D) of FITC at emission wavelength 417 nm.
**Figure S6.** Fluorescent decay and fitted curves of WLE hydrogel at emission wavelength 417 nm (a), 530 nm (b) and 630 nm (c).

**Figure S7.** Concentration dependence behaviors of WLE hydrogel upon pH.
**Figure S8.** Fluorescent emission spectra of WLE hydrogel under neutral (pH = 7) and alkaline (pH ≥ 10) conditions.

**Figure S9.** The cyclic responsiveness of WLE hydrogel upon pH. The change of $I_{417n}/I_{465n}$ within three consecutive cycles of WLE hydrogel in the presence of H⁺ (pH=1). $n$ represents the number of measurements.
**Figure S10.** Concentration dependence behaviors of WLE hydrogel upon Fe$^{3+}$.

**Figure S11.** The cyclic responsiveness of WLE hydrogel upon Fe$^{3+}$. The change of $I_{417}/I_{417Fe^{3+}}$ within three consecutive cycles of WLE hydrogel in the presence of Fe$^{3+}$ (10 mM).
**Figure S12.** Temperature-varying FTIR of WLE hydrogel with temperature range from 30 to 80°C.

**Figure S13.** Temperature dependence behaviors of WLE hydrogel.
**Figure S14.** Storage modulus $G'$ (red solid squares) and loss modulus $G''$ (black solid circles) versus temperature of WLE hydrogel.

**Figure S15.** Relationship between the temperature and the intensity of green-to-red emission ratio ($I_{530}/I_{615}$).