Electronic Supplementary Information

De novo design of self-assembly hydrogels based on Fmoc-diphenylalanine providing with drug release

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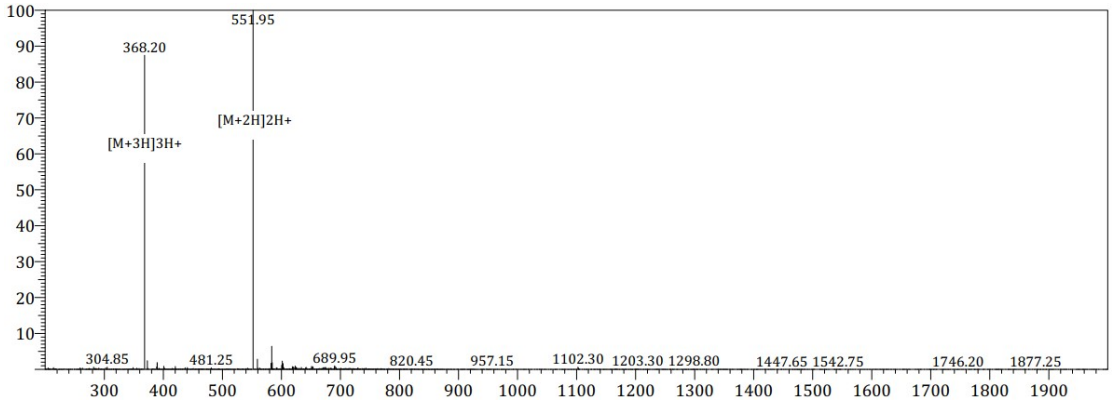

Figure S1. LC-MS spectrum of Fmoc-FFRRVR.

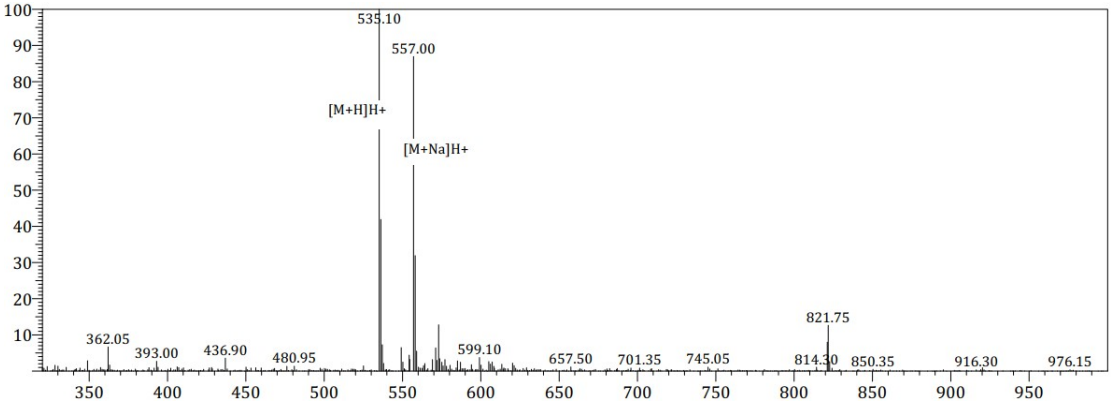

Figure S2. LC-MS spectrum of Fmoc-FF.

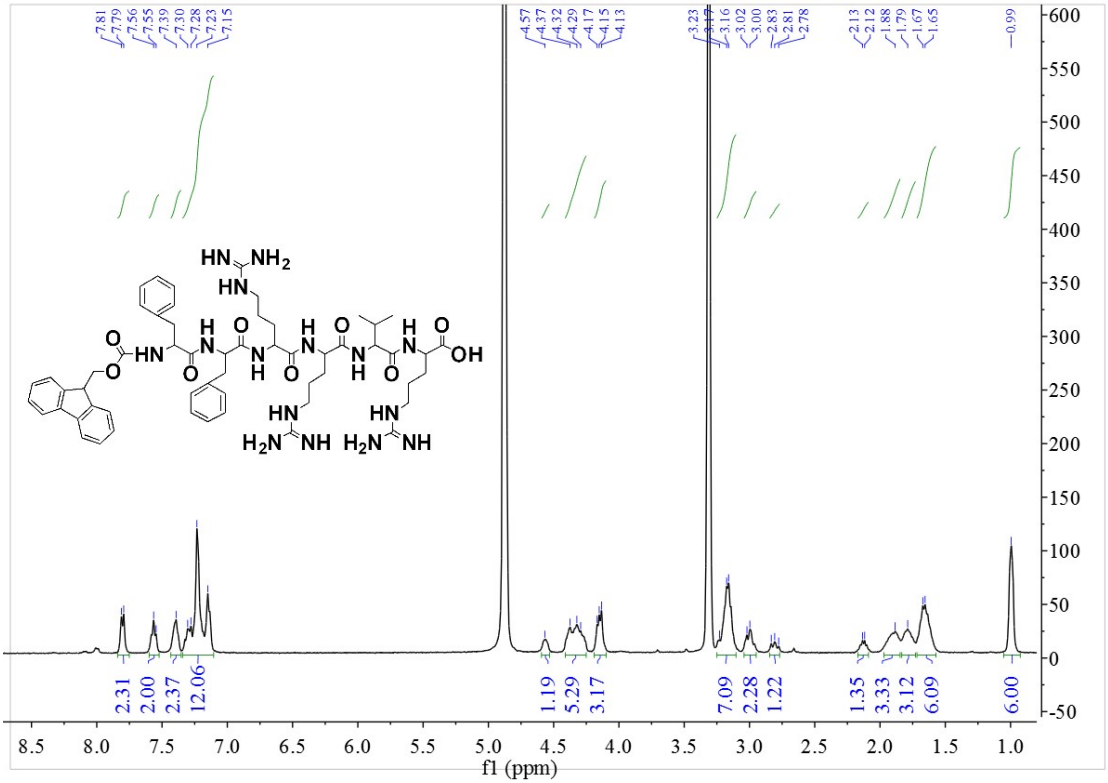

Figure S3. ^{1}H NMR spectrum of Fmoc-FFRRVR in CH_3OH-d_4.

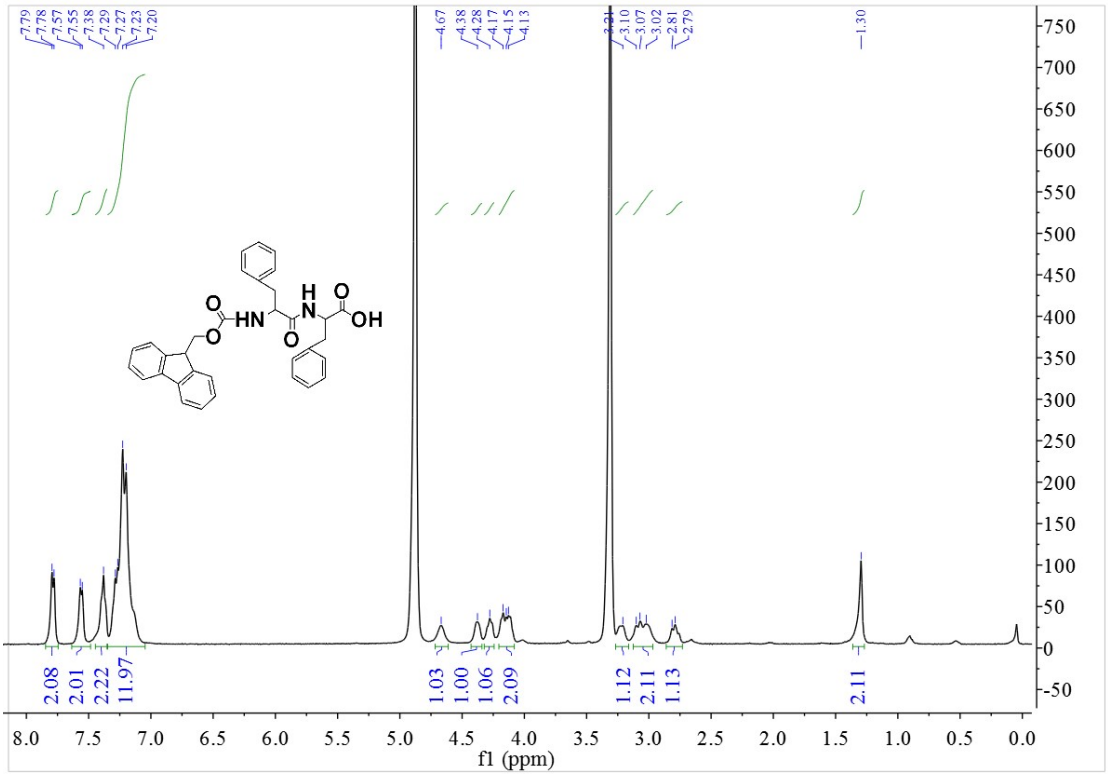

Figure S4. ^{1}H NMR spectrum of Fmoc-FF in CH_3OH-d_4.

The purified products were characterized using MS. Calcd. for $C_{56}H_{75}N_{15}O_9$ (E), $[M+2H]^{2+}$, 551.80, $[M+3H]^{3+}$, 368.20, found, 551.95, 368.20; calcd. for $C_{33}H_{30}N_2O_5$ (Fmoc-FF), $[M+H]^{+}$, 535.22, $[M+Na]^{+}$, 557.20, found 535.10, 557.00.

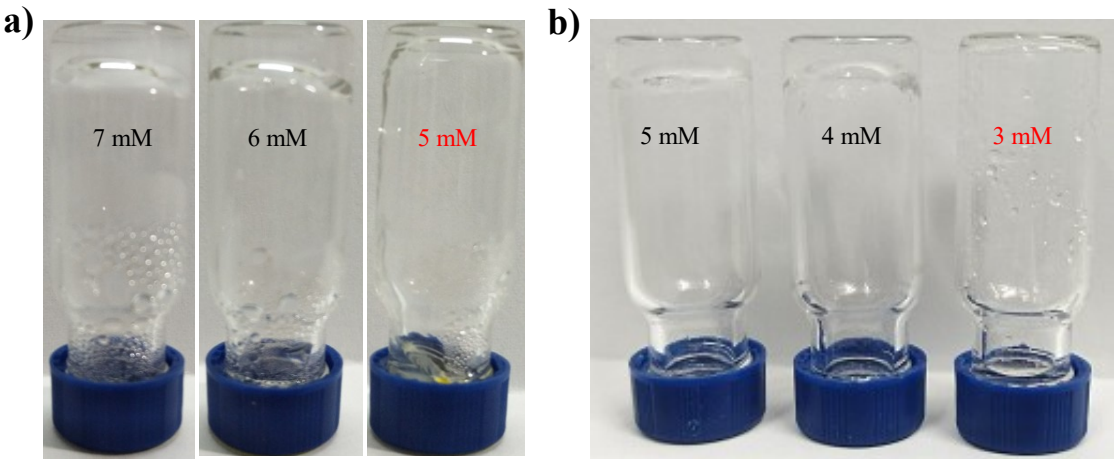

Figure S5. The photographs of CGC for Fmoc-FFRRVR and Fmoc-FF.

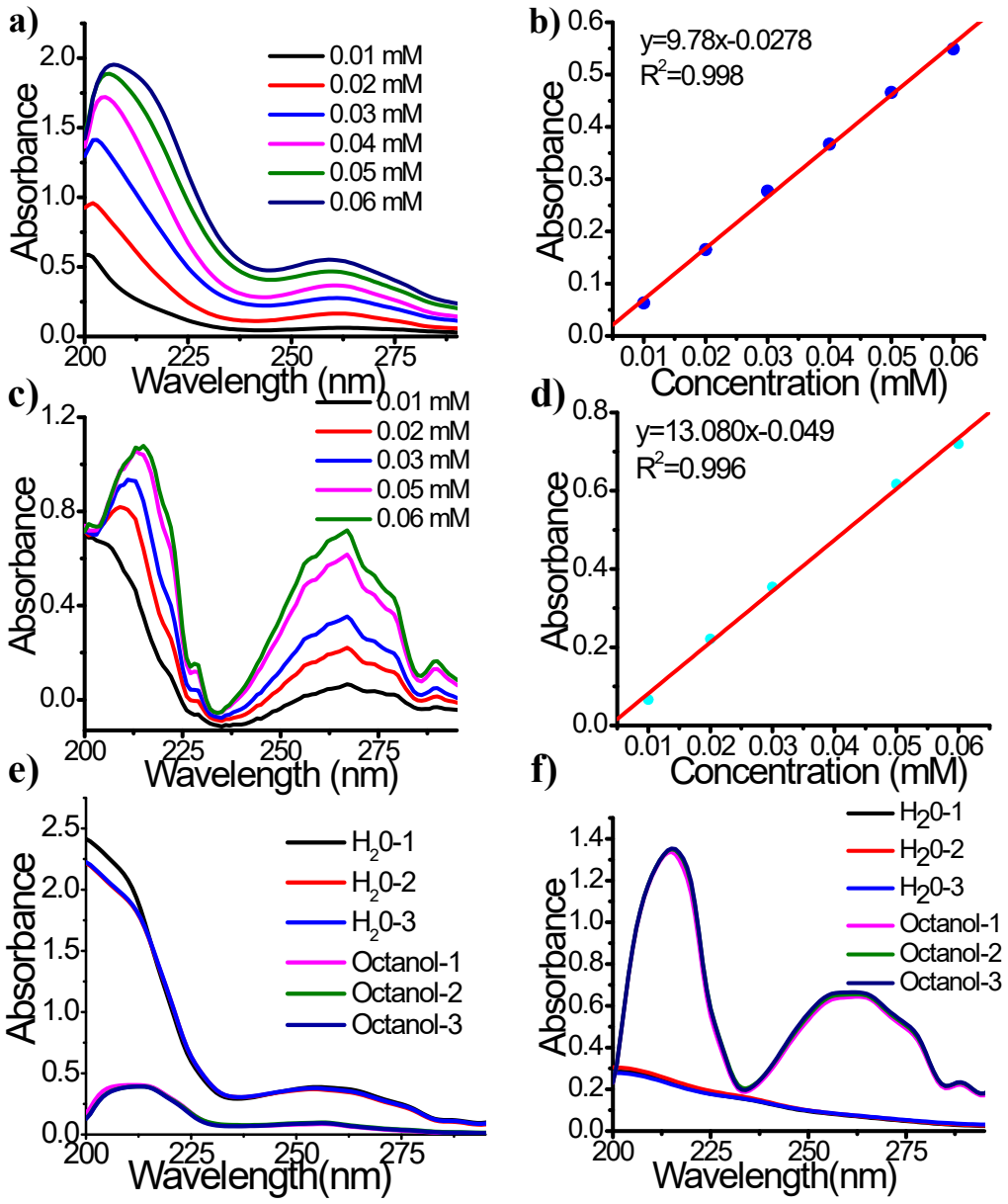

Figure S6. Solubility test of Fmoc-FFRRVR and Fmoc-FF. Absorption spectrum and standard curve of the Fmoc-FFRRVR (a-b) and Fmoc-FF (c-d). Absorption spectra of oil and water distribution of Fmoc-FFRRVR (e) and Fmoc-FF (f).

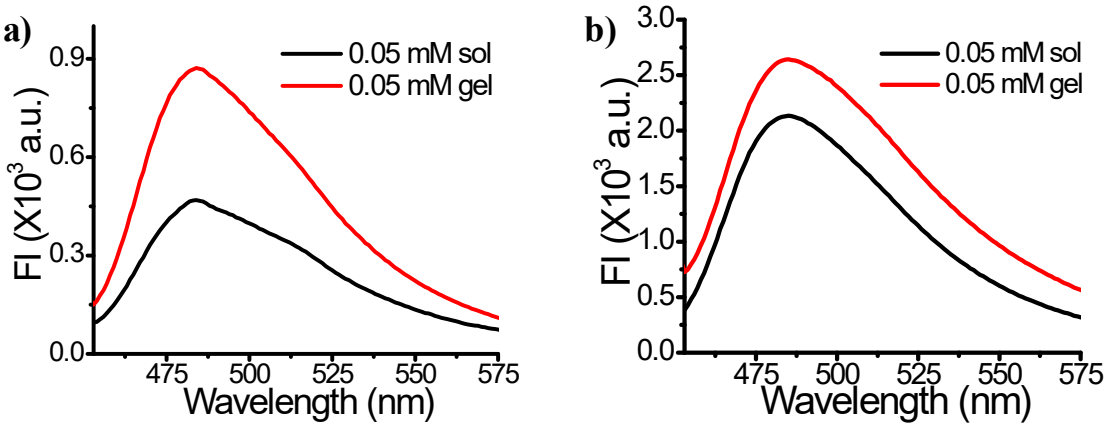

Figure S7. ThT banding test of Fmoc-FFRRVR and Fmoc-FF. Fluorescence spectrum of ThT in the Fmoc-FFRRVR (a) and Fmoc-FF gels (b). λ_{ex} = 440 nm.

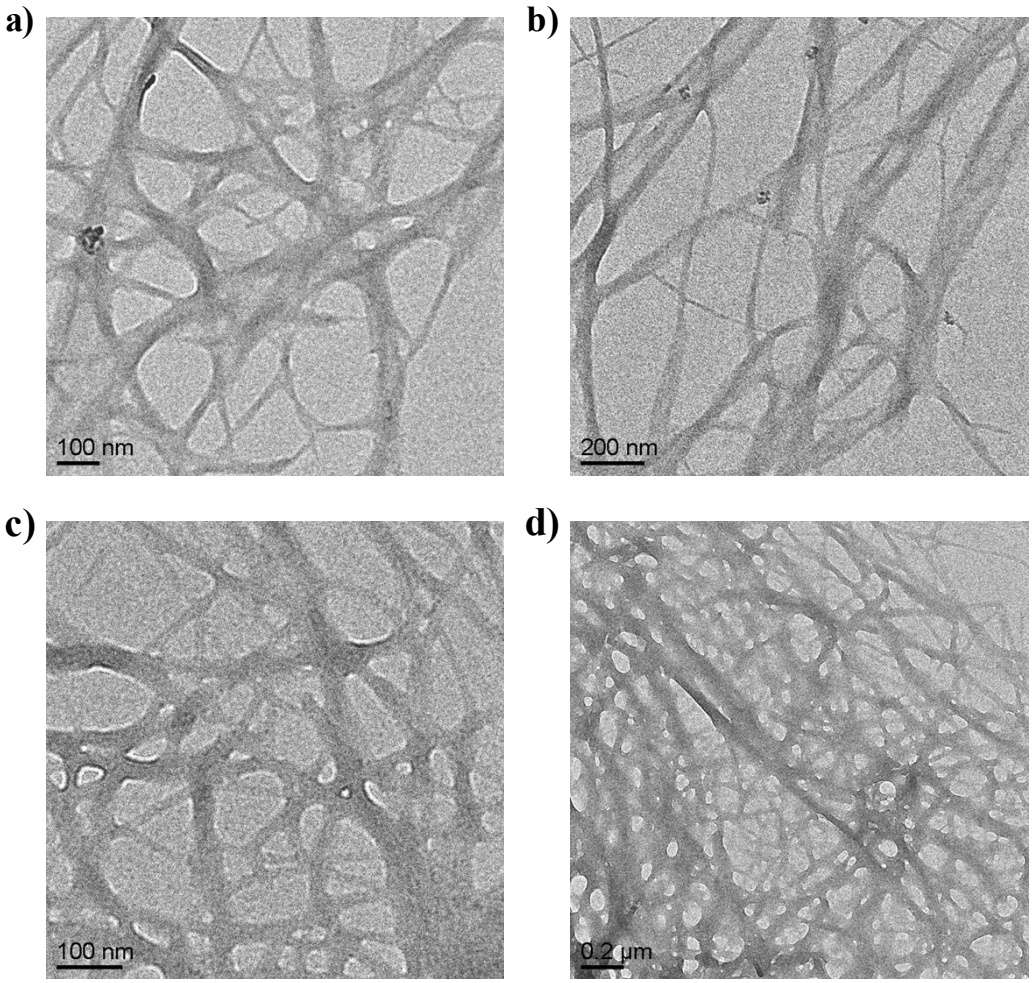

Figure S8. TEM images analysis of the hydrogel of Fmoc-FFRRVR (a-b) and Fmoc-FF (c-d).

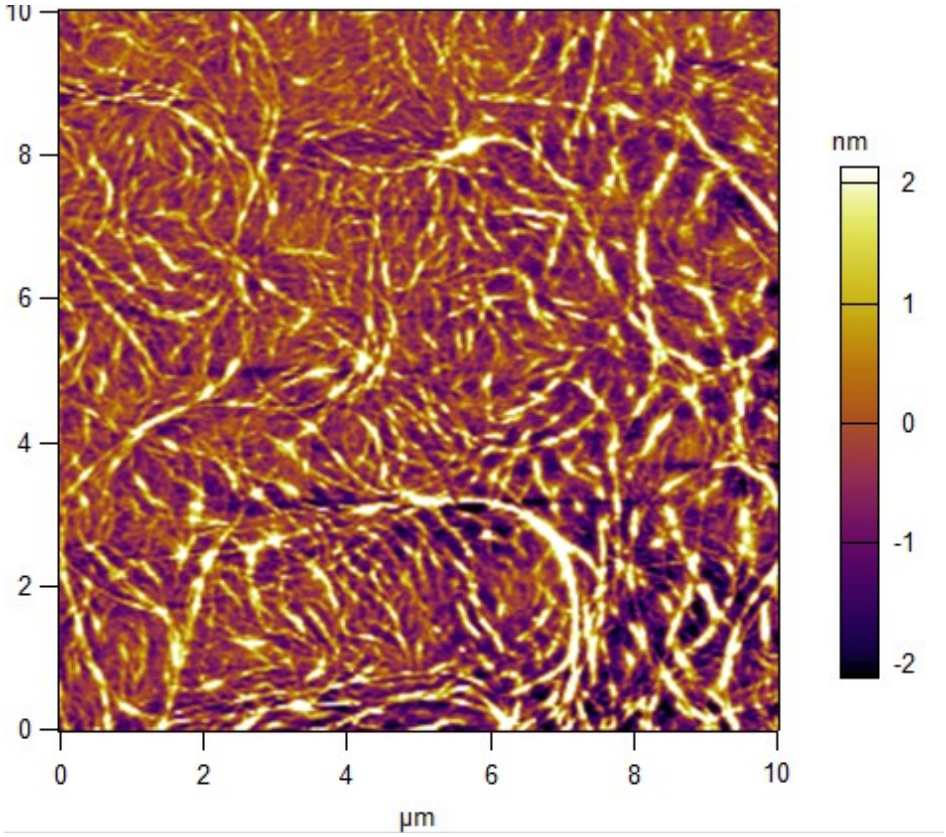

Figure S9. AFM height images of the Fmoc-FFRRVR gel. The right is z axis scale.

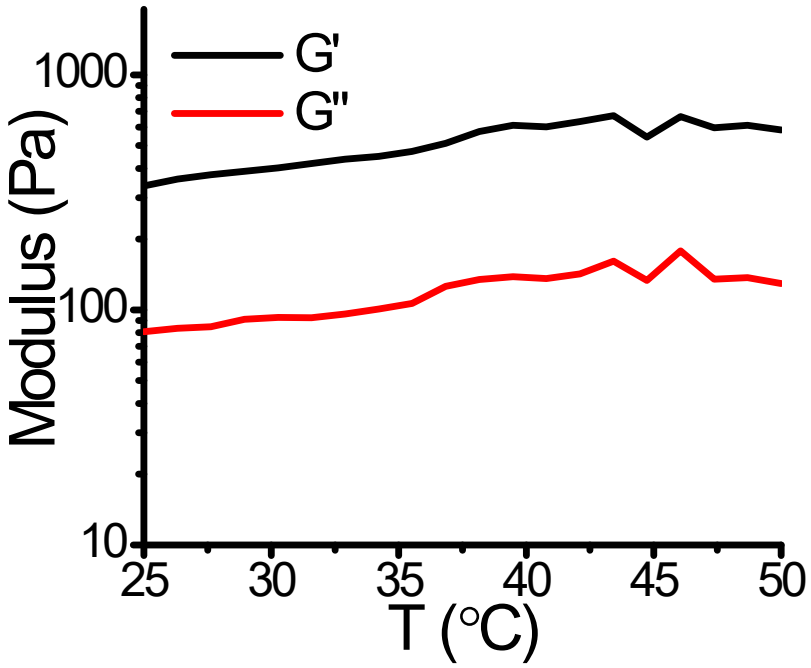

Figure S10. Stability test of Fmoc-FFRRVR gel in the range from 25 ℃ to 50 ℃.

Figure S11. Capability test of loading different dyes in Fmoc-FFRRVR gel. Those dyes in turns were fluorescein, bovine serum albumin, rhodamine B, azure A, glutathione, basic red 1, alpha-cyclodextrin, 2',7'-dichlorofluorescein, and blank.

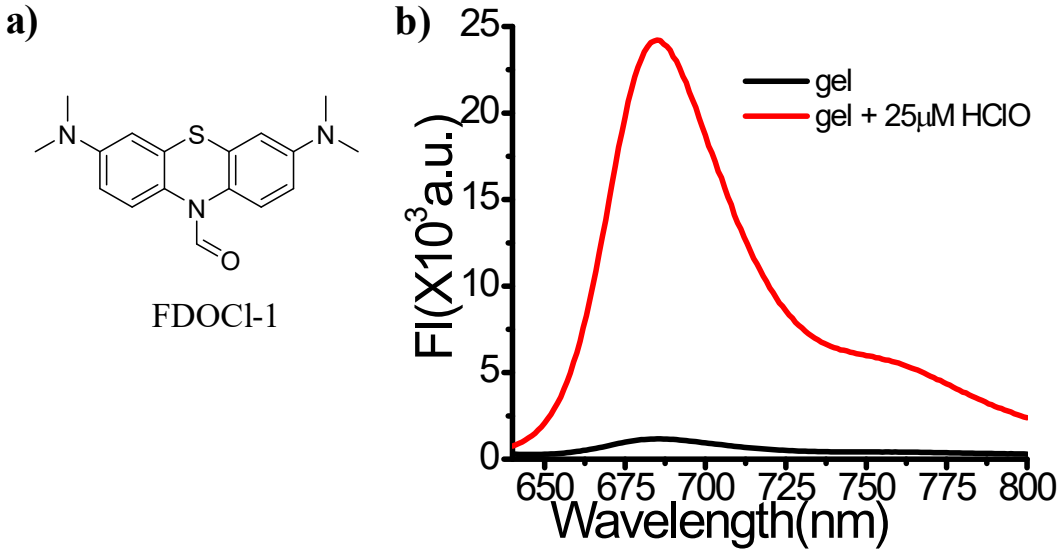

Figure S12. Property measurement of FDOCl-1 consisting in 8 mM Fmoc-FFRRVR gel. Molecular structure of FDOCl-1 (a), Fluorescence change of FDOCl-1 in the present of HClO (b).

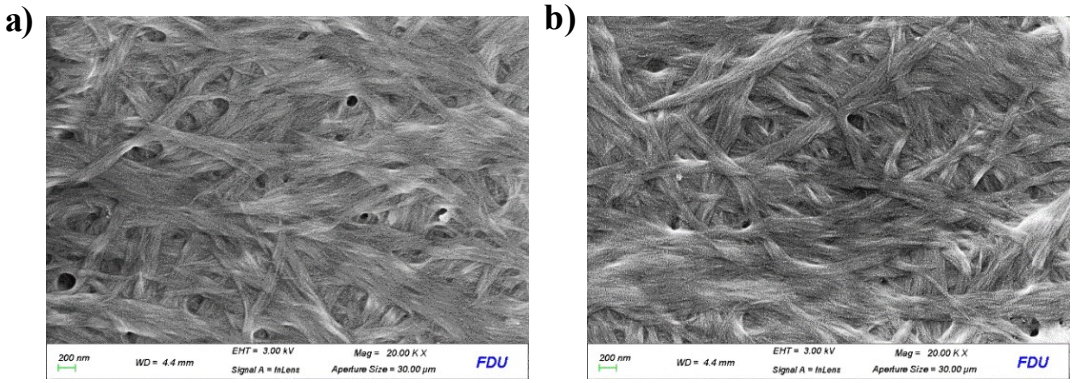

Figure S13. SEM images of different power. 8 mM Fmoc-FFRRVR gel (a), Fmoc-FFRRVR gel with 100 μg/mL Dox (b).

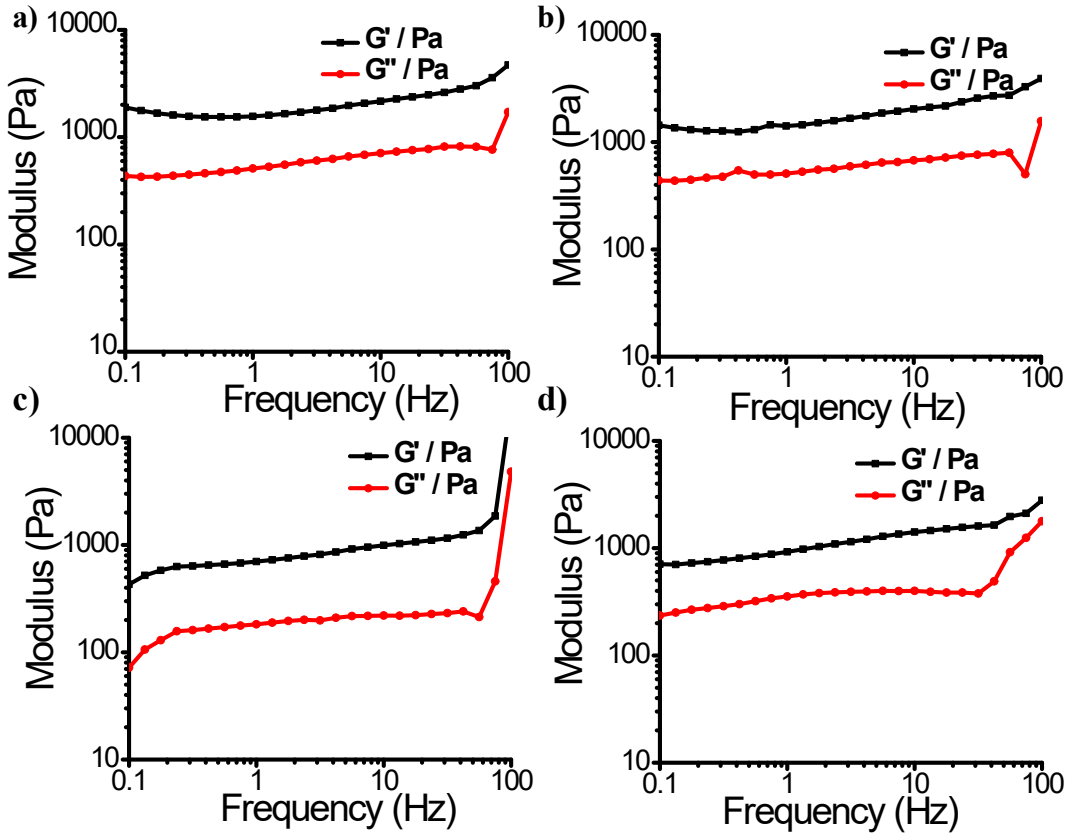

Figure S14. Frequency test of the gel of 10 mM Fmoc-FFRRVR with different Dox concentrations. (a) 0 μg/mL Dox, (b) 50 μg/mL Dox, (c) 100 μg/mL Dox and (d) 500 μg/mL Dox.

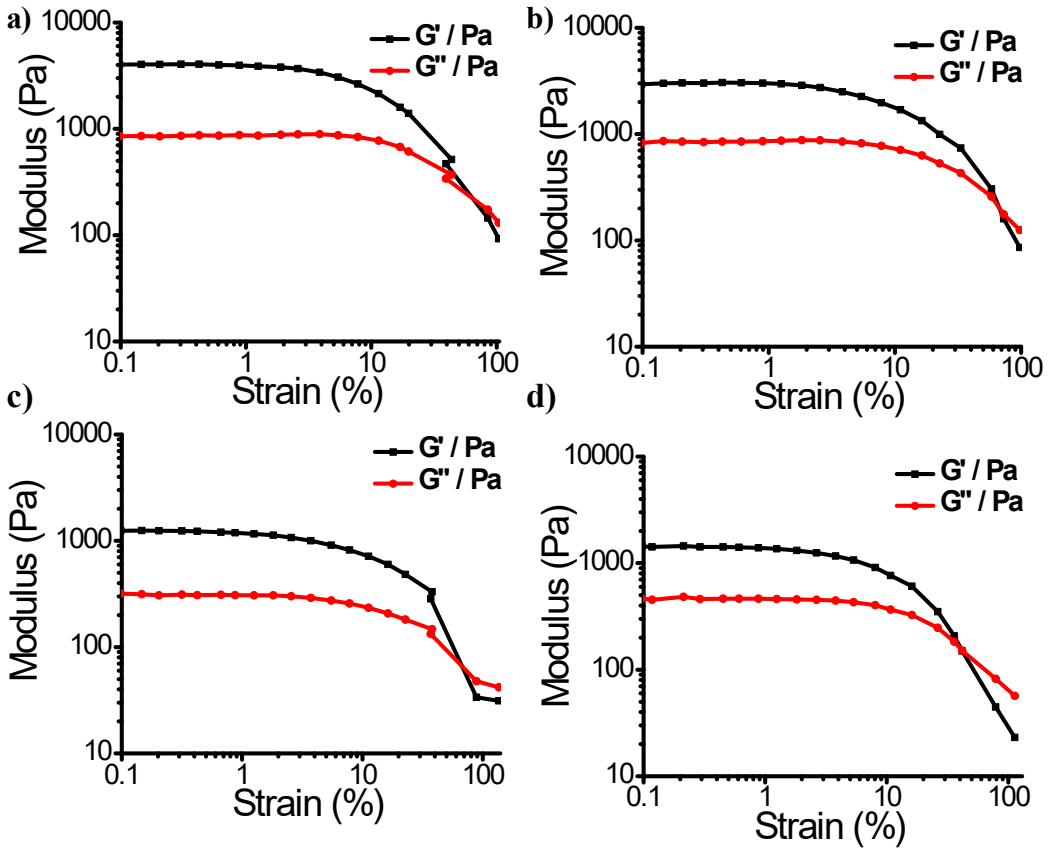

Figure S15. Strain test of the gel of 10 mM Fmoc-FFRRVR with different Dox concentrations. (a) 0 μg/mL Dox, (b) 50 μg/mL Dox, (c) 100 μg/mL Dox and (d) 500 μg/mL Dox.

a)

Concentration /mM	Area
0.00025	**1.61829**
0.0005	**5.06704**
0.001	**11.65889**
0.0015	**20.05343**
0.002	**26.59497**
0.005	**73.64879**
0.01	**159.37292**
0.02	**308.9945**

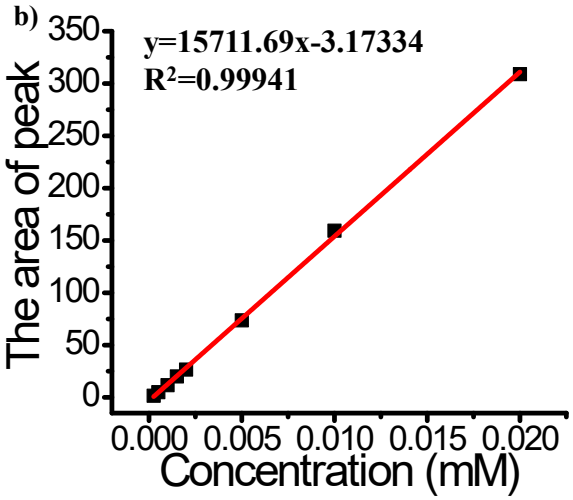

Figure S16. Table of area respond to different concentration of Fmoc-FFRRVR concentrations in use of HPLC (a) and standard curve of Fmoc-FFRRVR (b).

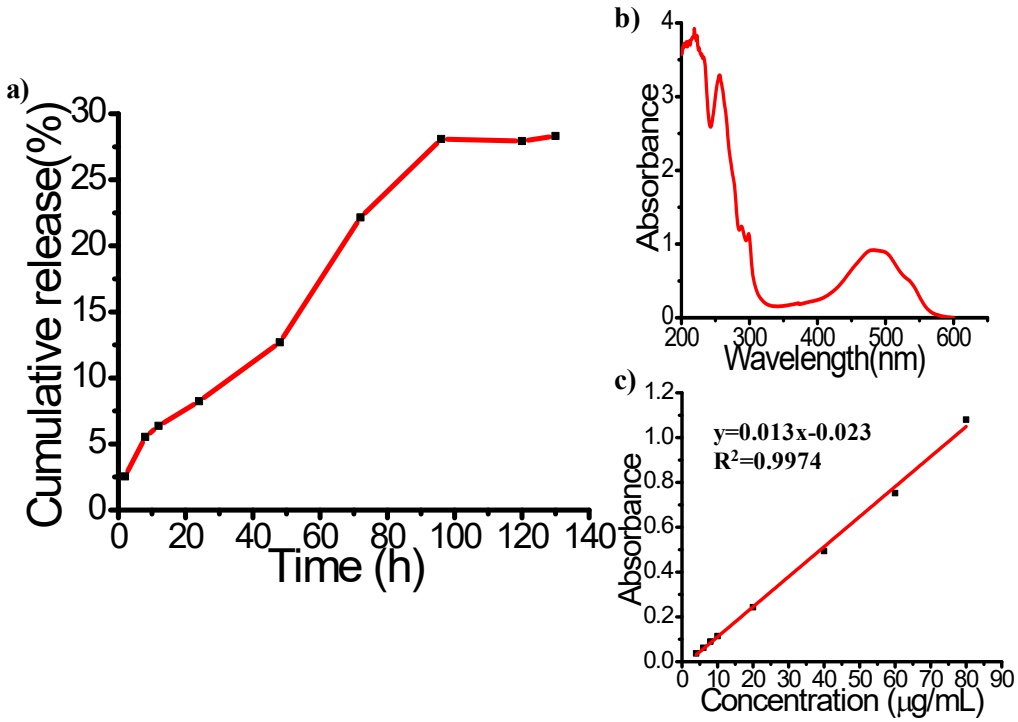

Figure S17. Cumulative release Dox in Fmoc-FFRRVR gel. Dox's absorption spectra (b) and standard curve (c).

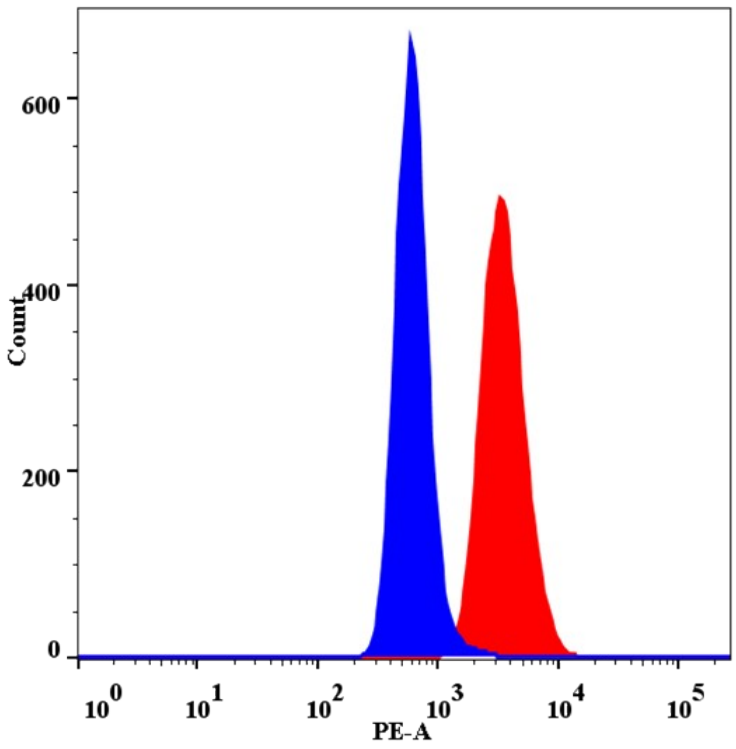

Figure S18. The endocytosis test of hydrogel (0.06 mM) with Dox (10 μg/mL) at 4 (blue) and 37 °C (red) for A549 cells.