Supplementary Materials

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Scheme 1. Synthesis of Boc-D-F₂-Phe-D-Oxd-OH B and Boc-D-F₂-Phe-L-Oxd-OH C, with yields after flash chromatography.
$^1$H NMR spectrum of Boc-D-F$_2$-Phe-Oxd-OH B in CD$_3$OD

COSY spectrum of Boc-D-F$_2$-Phe-D-Oxd-OH B in CDCl$_3$
$^{13}$C NMR spectrum of Boc-D-F$_2$-Phe-D-Oxd-OH B in CD$_3$OD

$^{19}$F NMR spectrum of Boc-D-F$_2$-Phe-D-Oxd-OH B in CDCl$_3$
IR-ATR spectrum of Boc-D-F₂-Phe-D-Oxd-OH B
$^1$H NMR spectrum of Boc-D-F$_2$-Phe-L-Oxd-OH C in CD$_3$OD

COSY spectrum of Boc-D-F$_2$-Phe-L-Oxd-OH C in CDCl$_3$
$^{13}$C NMR spectrum of Boc-D-F$_2$-Phe-L-Oxd-OH C in CD$_3$OD

$^{19}$F NMR spectrum of Boc-D-F$_2$-Phe-L-Oxd-OH C in CDCl$_3$
IR-ATR spectrum of Boc-D-F2-Phe-L-Oxd-OH C

Transmittance (a.u.)

Wavelength (cm$^{-1}$)

1DL
Figure S1. Analysis of the minimum gelation concentration (MGC) need to form hydrogels from A: from left to right: 0.1% w/w concentration; 0.2% w/w concentration; 0.3% w/w concentration; 0.4% w/w concentration.

Figure S2. Analysis of the minimum gelation concentration (MGC) need to form hydrogels from C: from left to right: 0.1% w/w concentration; 0.2% w/w concentration; 0.3% w/w concentration; 0.4% w/w concentration.
Figure S3. From left to right, hydrogel images of 1, 2 and 3 obtained with an optic microscope with a 10x magnification. Scalebar: 100 μm.

Figure S4. From left to right, hydrogel images of 7, 8 and 9 obtained with an optic microscope with a 40x magnification. Scalebar: 25 μm.
Figure S5. From top to bottom, DLS correlation coefficient, number and volume analysis of particles after filtration: (a) solution 4; (b) solution 5; (c) solution 6.
Figure S6. Amplitude sweep analysis of hydrogel 1.

Figure S7. Amplitude sweep analysis of hydrogel 2.
Figure S8. Amplitude sweep analysis of hydrogel 3.
**Figure S9.** HPLC-MS analysis of gelators B and C before (left) and after (right) the addition of GdL: (a) gelator B (0.5 w/w concentration) in NaOH (no gel is formed); (b) gelator B (0.5% w/w concentration) in PBS (no gel is formed); (c) gelator C (0.5 w/w concentration) in NaOH (gel is formed); (d) gelator C (0.5% w/w concentration) in PBS (gel is formed). Retention times: gelator A (after hydrolysis) = 6.3 min; gelator B = 6.7 min; gelator C = 6.7 min.
Figure S10. Time sweep analysis of hydrogel 10.
**Figure S11.** Absorbance spectrum of hydrogel 10, collected using an optical path of 1.0 cm cuvette at 10 nm/s with a Cary300 UV-Vis double beam spectrophotometer, having a cuvette full of water as a reference.
Figure S12. $^{19}$F-NMR spectra registered in D$_2$O of gelator A (a) before the gelation process and (b) afterwards and gelator C (c) before the gelation process and (d) afterwards.