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.



COSY spectrum of Boc-D-F2-Phe-D-Oxd-OH B in CDCl3



$^1\!\mathrm{H}$ NMR spectrum of Boc-D-F2-Phe-Oxd-OH **B** in CD3OD



¹³C NMR spectrum of Boc-D-F₂-Phe-D-Oxd-OH **B** in CD₃OD





 ^1H NMR spectrum of Boc-D-F2-Phe-L-Oxd-OH C in CD3OD

COSY spectrum of Boc-D-F2-Phe-L-Oxd-OH C in CDCl3





 ^{13}C NMR spectrum of Boc-D-F2-Phe-L-Oxd-OH C in CD3OD

¹⁹F NMR spectrum of Boc-D-F₂-Phe-L-Oxd-OH C in CDCl₃







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 μ m.



Figure S4. From left to right, hydrogel images of 7, 8 and 9 obtained with an optic microscope with a 40x magnification. Scalebar: $25 \mu m$.



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. ¹⁹F-NMR spectra registered in D₂O of gelator **A** (a) before the gelation process and (b) afterwards and gelator **C** (c) before the gelation process and (d) afterwards.