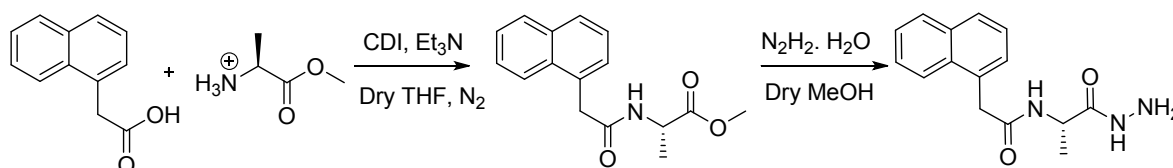


Supporting information

Mechano-responsive gelation of water by a short alanine-derivative

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Scheme S1. Synthetic protocol for preparing **Ala-hyd**.

Synthesis and characterizations

(S)-N-(1-hydrazinyl-1-oxopropan-2-yl)-2-(naphthalene-1-yl)acetamide: Ala-hyd

To the dry methanolic solution (S)-Methyl 2-(2-(naphthalene-1-yl)acetamido)propanoate,¹ hydrazine hydrate was added drop wise at 0 °C. The reaction mixture was further stirred for 18 h at RT. The complete consumption of starting material was not observed even after prolonged reaction time. Methanol was removed by vacuum and the product purified by column chromatography (stationary phase was silica 100-200 mesh and eluent phase was CHCl₃ /MeOH) which resulted a white solid in 67% yield. m.p=205 °C. ¹H NMR (400 MHz, d₆-DMSO) δ(ppm)= 9.07(1H, N-H), 7.39-8.33(7H, Nap-H), 7.38 (1H, NH), 4.19-4.26(1H, C-H), 4.17(2H, NH₂), 3.87-3.96(2H, Nap-CH₂), 1.16-1.18(3H, CH₃) ¹³C NMR (125 MHz, DMSO) δ=171.99, 170.10, 133.77, 133.32, 132.48, 128.76, 128.16, 127.44, 126.35, 126.05, 125.94, 124.85, 47.33, 39.87, 19.14 C₁₅H₁₇N₃O₂+H cacl: 272.1394, found: 272.1401.

(1) Yavvari, P. S.; Srivastava, A. *RSC Adv* **2013**, 3, 17244–17253.

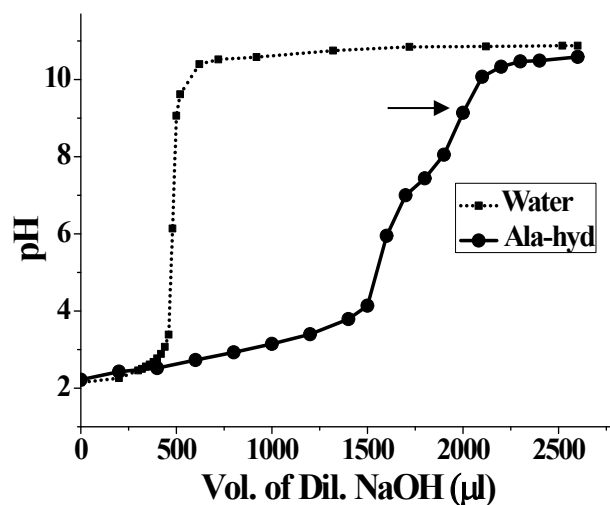


Figure S1. Titration curve employed for determination of pK_a for **Ala-hyd**. Solid line: 0.025 M **Ala-hyd**, Dashed line: Water (control). The apparent pK_a value for **Ala-hyd** was found to be 8.9 (shown by arrow).

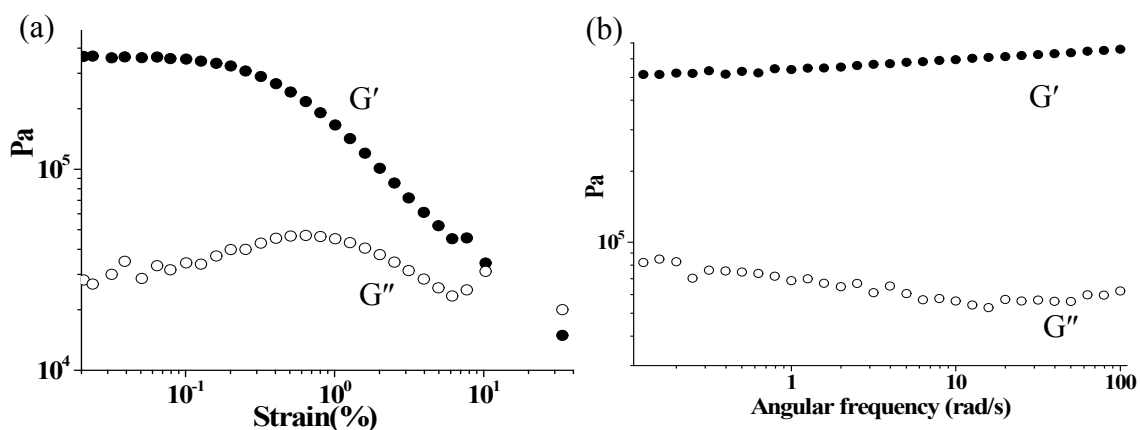


Figure S2. Rheological behavior of the hydrogel formed upon shearing an **Ala-hyd** (7.0 mg/mL) solution in 50 mM PB, pH =7 at 2500 rpm for 5 min. (a) Amplitude sweep test (b) Frequency sweep test showing storage modulus (G') was greater than loss modulus (G''). This indicates the gel is formed by entangled network of fibrillar assemblies.

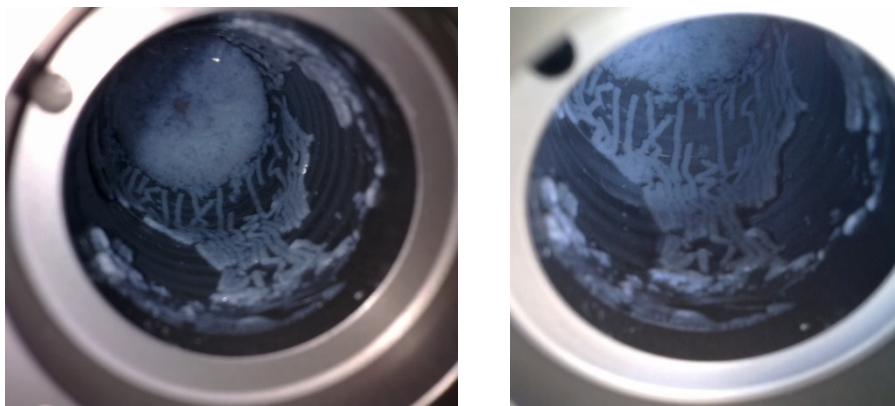


Figure S3. Formation of spaghetti-like macroscopic aggregates upon shearing the samples at 2500 rpm for 600 s.

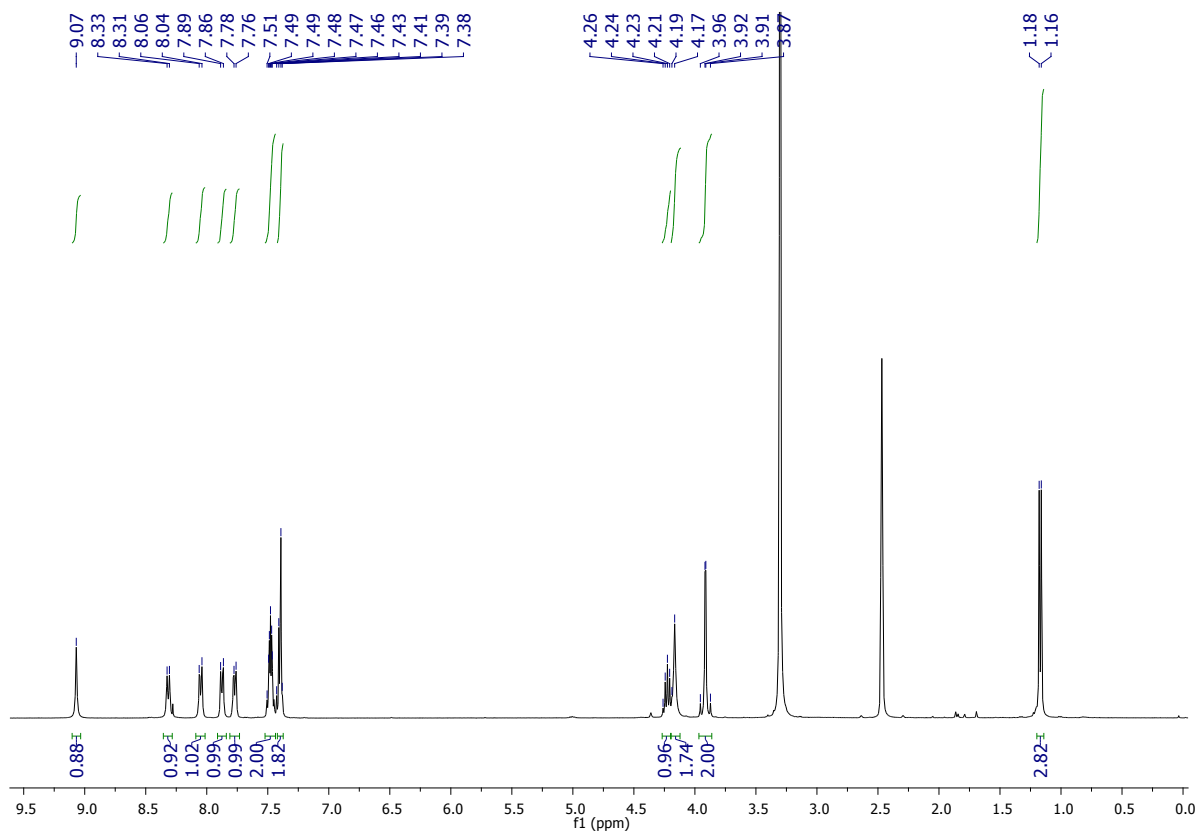


Figure S4. ^1H NMR (400 MHz) spectra of Ala-hyd in DMSO- d_6 .

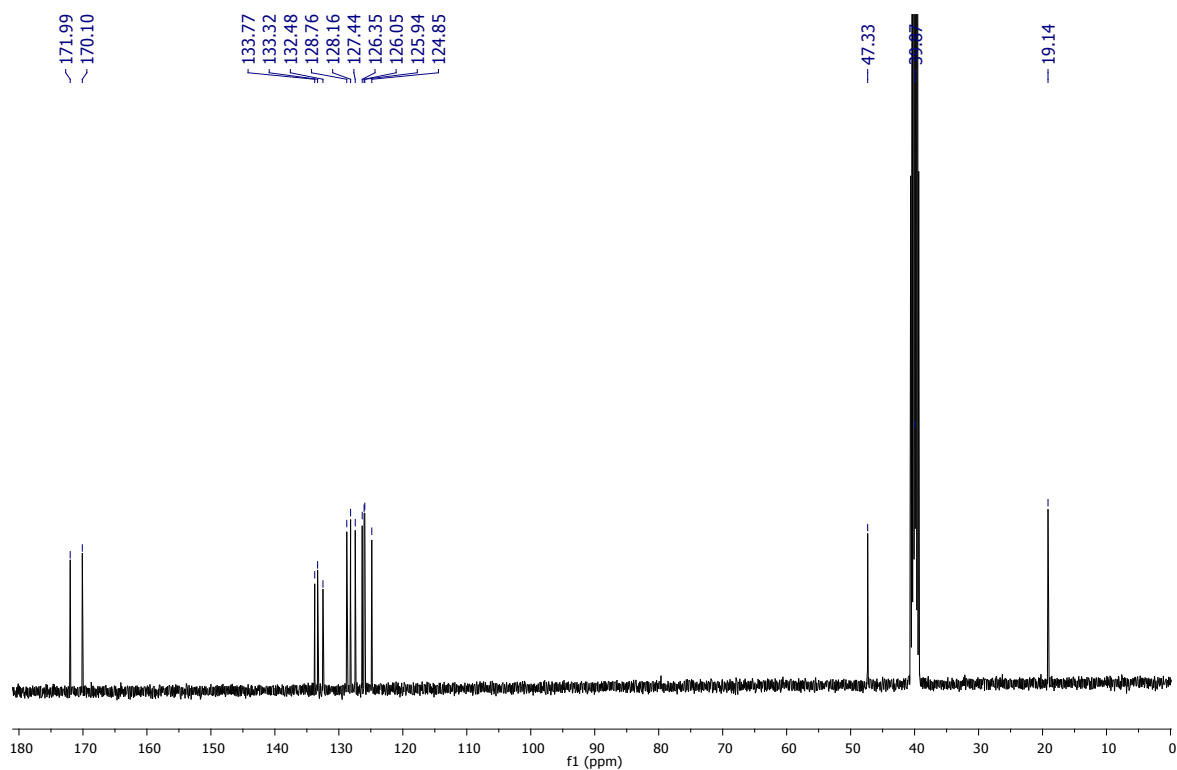


Figure S5. ^{13}C NMR (100 MHz) spectra of Ala-hyd in DMSO- d_6 .