Electronic Supplementary Material (ESI) for Soft Matter.


Supporting Information for Manuscript Entitled with

# Hydrogels assembled from star-shaped polypeptides with dendrimer as core

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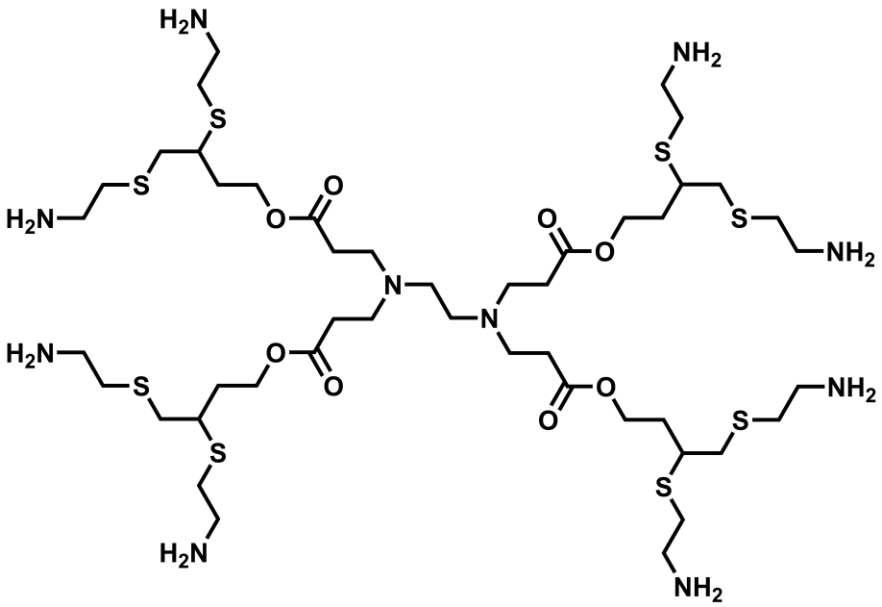
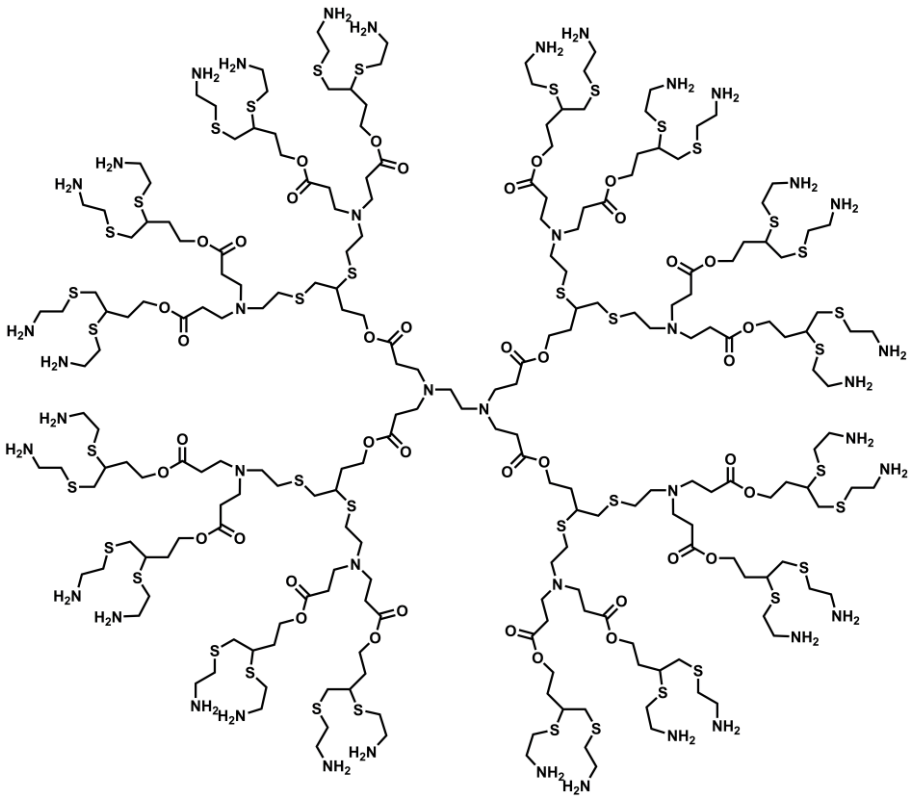


**Scheme S1.** Chemical structure of G2-[$NH_2$]$_8$.



**Scheme S2.** Chemical structure of G4-$[NH_2]_{32}$.

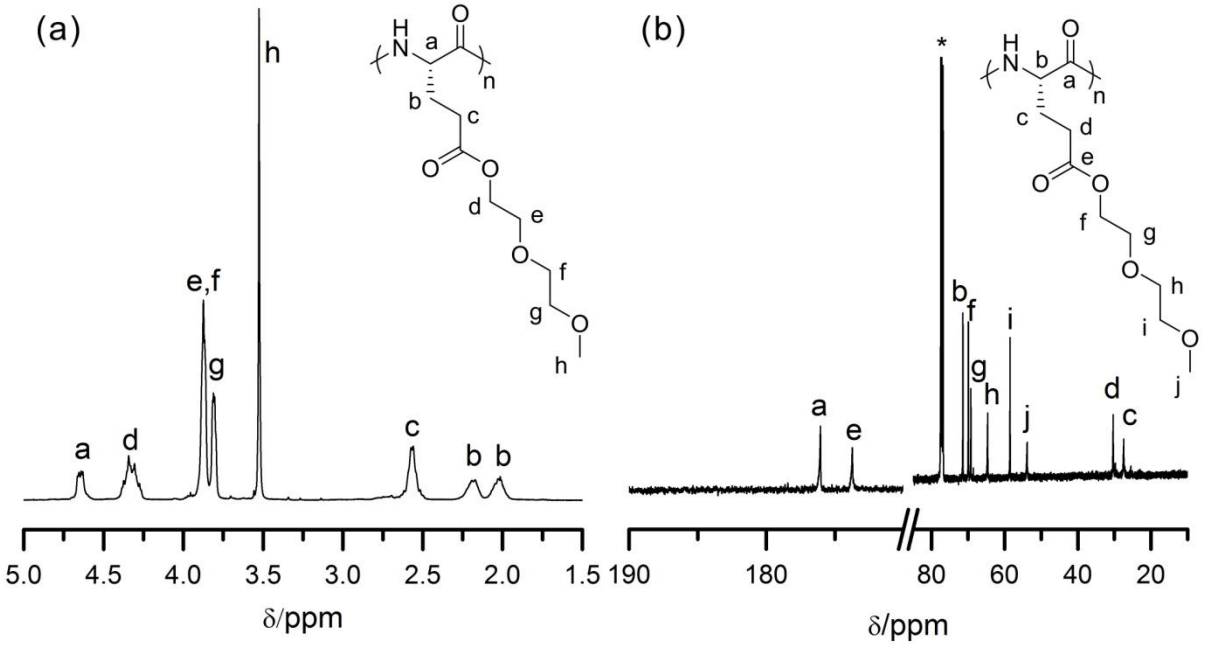



**Figure S1.** (**a**) $^{1}H$ and (**b**) $^{13}C$ NMR spectra of G2-$[NH_2]_8$-$(EG_2Glu)_{15}$.

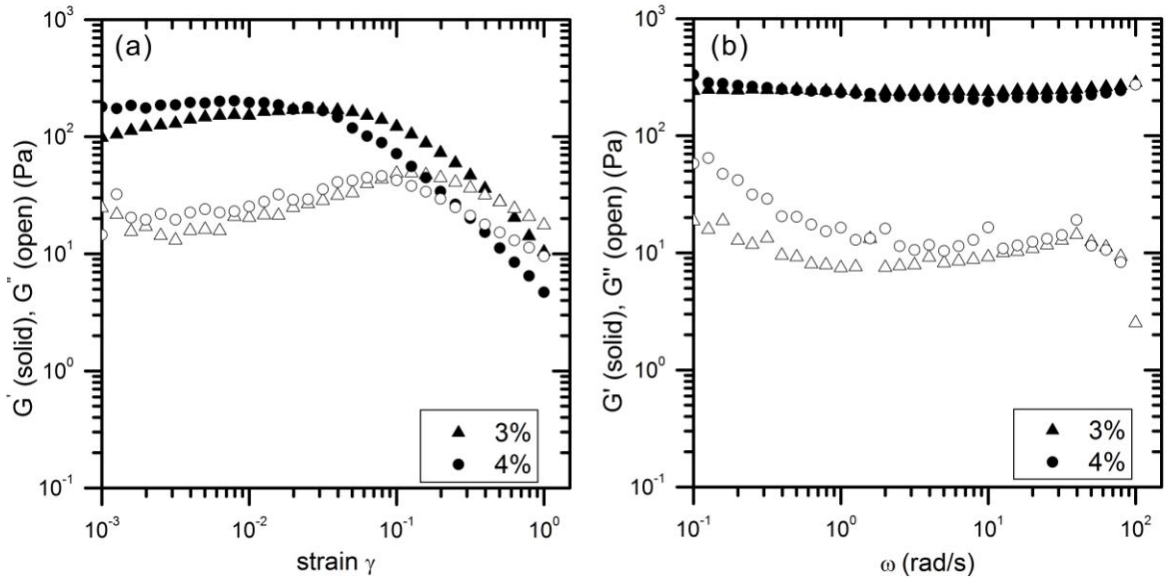



**Figure S2.** (**a**) Strain sweeps for the G2-$[NH_2]_8$-$(EG_2Glu)_{30}$ aqueous solution at angular frequency ω = 1 rad/s; (**b**) Storage modulus G' (solid symbols) and loss modulus G" (open symbols) as a function of angular frequency for the same samples (γ = 0.01) at two different concentrations: (▲) 3.0 wt %, (●) 4.0 wt %.

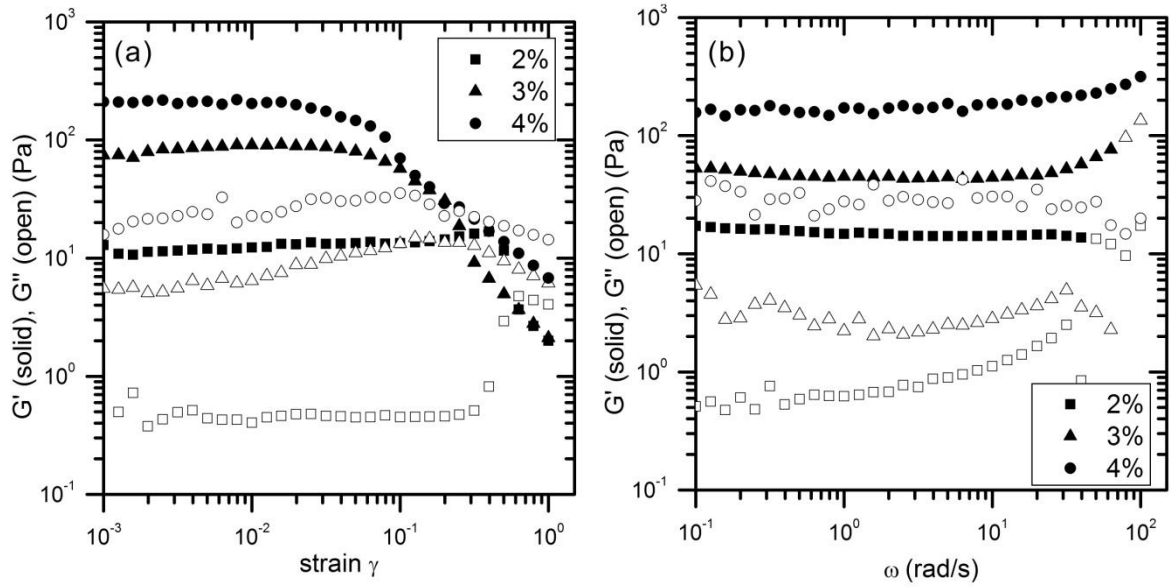



**Figure S3.** (**a**) Strain sweeps for the G4-$[NH_2]_{32}$-$(EG_2Glu)_{15}$ aqueous solution at angular frequency ω = 1 rad/s; (**b**) Storage modulus G' (solid symbols) and loss modulus G" (open symbols) as a function of angular frequency for the same samples (γ = 0.01) at three different concentrations: (■) 2.0 wt %, (▲) 3.0 wt %, (●) 4.0 wt %.

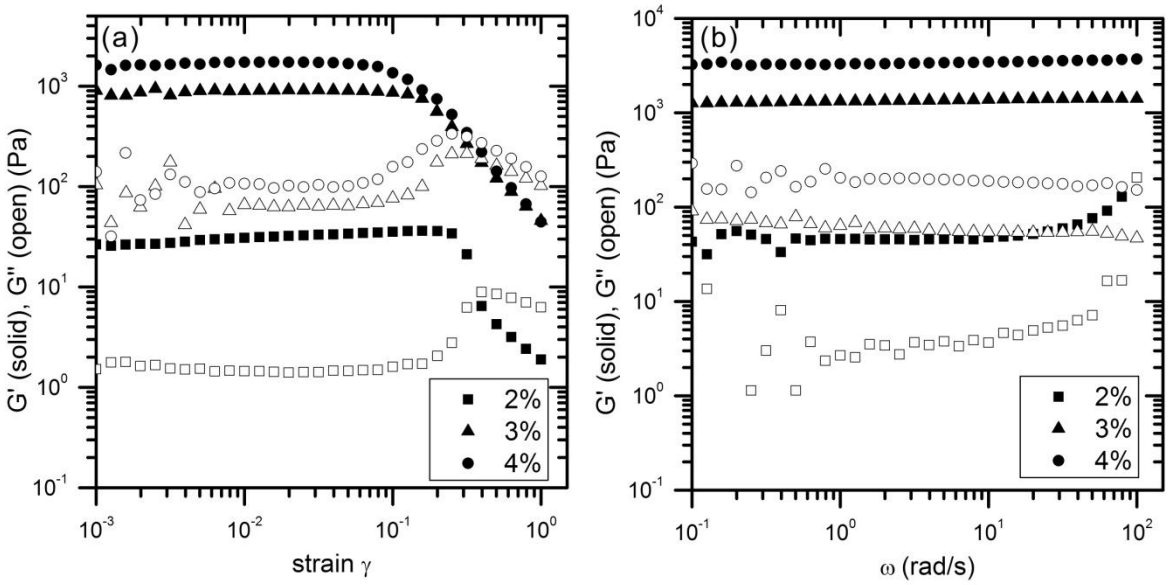



**Figure S4.** (**a**) Strain sweeps for the G4-$[NH_2]_{32}$-$(EG_2Glu)_{30}$ aqueous solution at angular frequency ω = 1 rad/s; (**b**) Storage modulus G' (solid symbols) and loss modulus G" (open symbols) as a function of angular frequency for the same samples (γ = 0.01) at three different concentrations: (■) 2.0 wt %, (▲) 3.0 wt %, (●) 4.0 wt %.

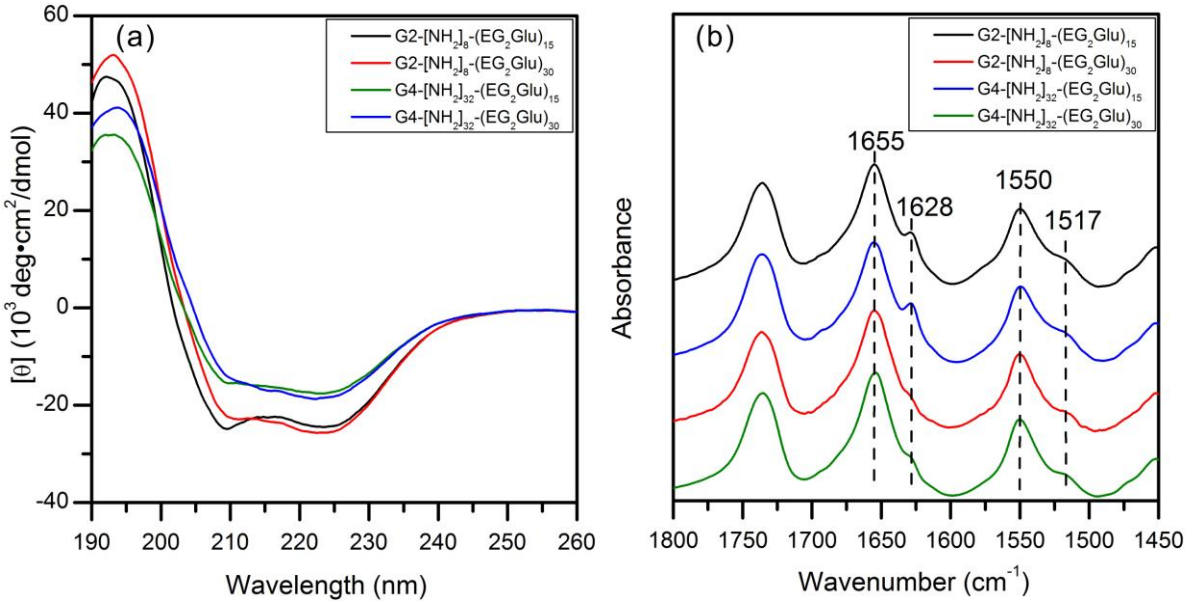



**Figure S5.** Comparison of (**a**) CD and (**b**) FT-IR spectra of G2-$[NH_2]_8$-$(EG_2Glu)_n$ and G4-$[NH_2]_{32}$-$(EG_2Glu)_n$ (n = 15, 30).

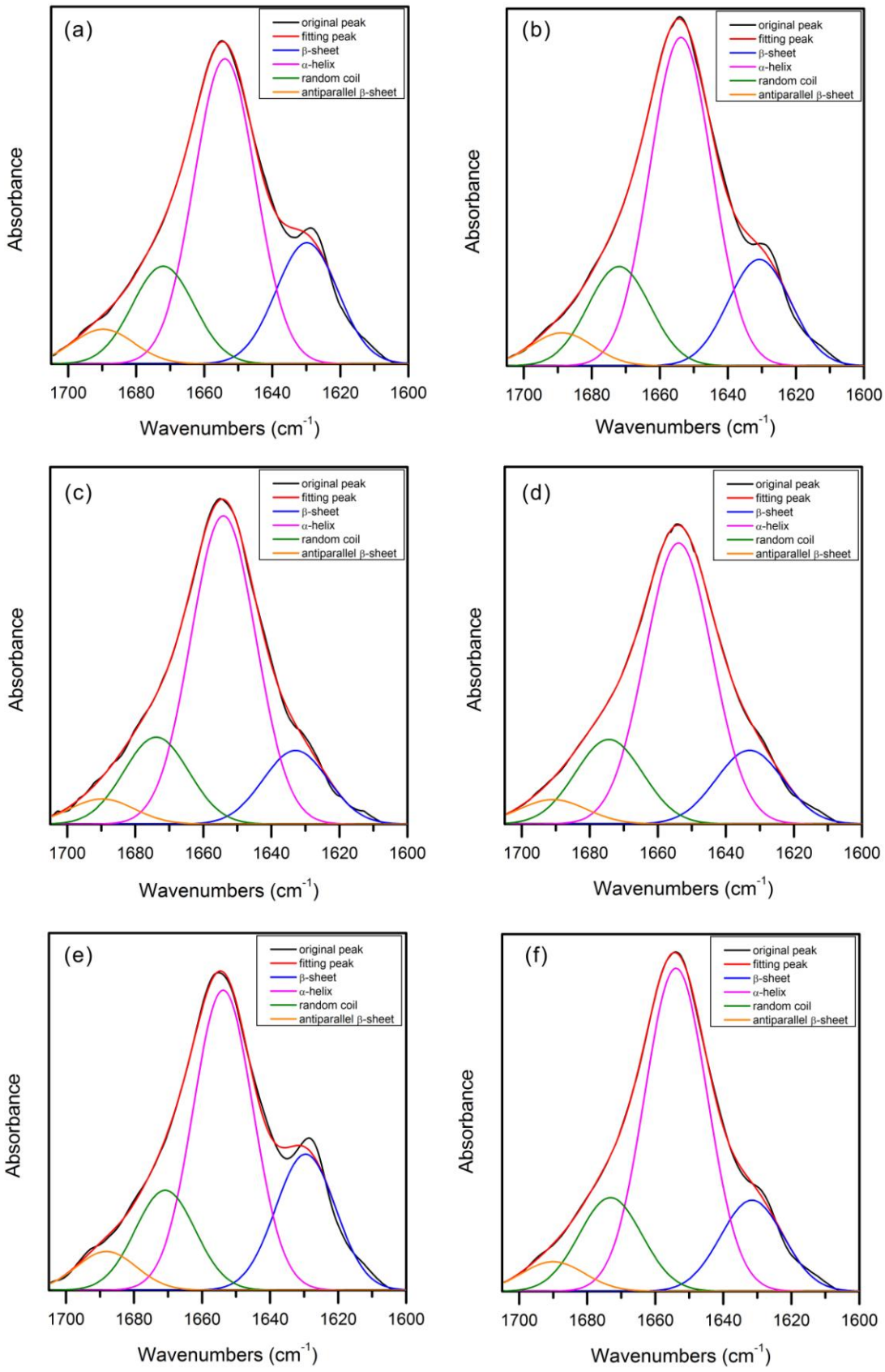



**Figure S6.** Deconvolution of amide Ⅰ band in FT-IR spectra of G2-$[NH_2]_8$-$(EG_2Glu)_{15}$ (**a**), G2-$[NH_2]_8$-$(EG_2Glu)_{20}$ (**b**), G2-$[NH_2]_8$-$(EG_2Glu)_{30}$ (**c**), G2-$[NH_2]_8$-$(EG_2Glu)_{50}$ (**d**), G4-$[NH_2]_{32}$-$(EG_2Glu)_{15}$ (**e**), and G4-$[NH_2]_{32}$-$(EG_2Glu)_{30}$ (**f**).

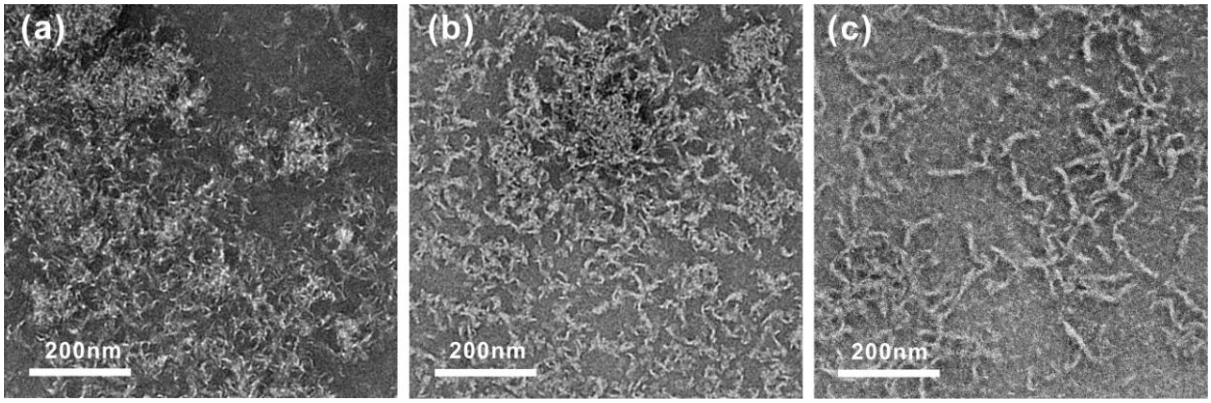



**Figure S7.** TEM images of G2-$[NH_2]_8$-$(EG_2Glu)_{30}$ aqueous solutions: (**a**) 0.03 wt%, (**b**) 0.3 wt%, (**c**) 3 wt%.

**Table S1.** The secondary structure contents calculated by deconvolution of amide Ⅰ band in FT-IR spectra.

| Sample | α-helix | β-sheet | Antiparallel β-sheet | Random coil |
|---|---|---|---|---|
| G2-$[NH_2]_8$-$(EG_2Glu)_{15}$ | 54.6% | 21.7% | 6.2% | 17.5% |
| G2-$[NH_2]_8$-$(EG_2Glu)_{20}$ | 57.9% | 18.8% | 5.8% | 17.5% |
| G2-$[NH_2]_8$-$(EG_2Glu)_{30}$ | 62.4% | 14.9% | 5.1% | 17.6% |
| G2-$[NH_2]_8$-$(EG_2Glu)_{50}$ | 60.6% | 15.9% | 5.3% | 18.2% |
| G4-$[NH_2]_{32}$-$(EG_2Glu)_{15}$ | 52.1% | 23.7% | 6.7% | 17.4% |
| G4-$[NH_2]_{32}$-$(EG_2Glu)_{30}$ | 60.1% | 17.0% | 5.5% | 17.4% |