

Supporting Information of Manuscript Entitled with
**Pathway-Dependent Re-assembly of Dual-Responsive ABC
Terpolymer in Water**

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Table S1 Summary of copolymer molecular weights and compositions.

Sample	$[M]_0/[macro-CTA]_0$	$^aConv. (%)$	DP	PDI	$M_n(GPC)/kDa$	$M_n(NMR)/kDa$
EB	30	93	28	1.09	5.6	6.2
EBD	35	92	32	1.14	12.6	11.2

a) Calculated by 1H NMR in $CDCl_3$.

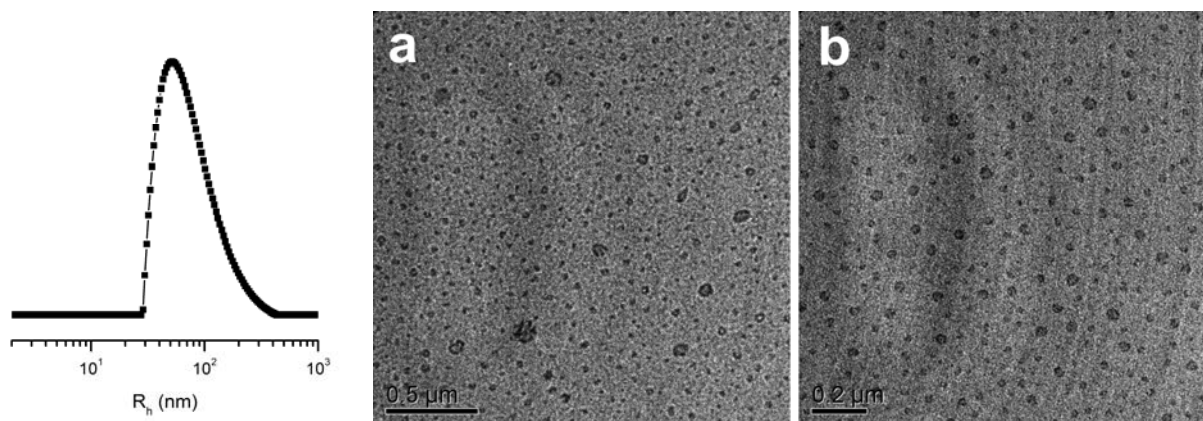


Figure S1. DLS results (left) and TEM images (right) of aggregates formed from 0.1 wt% PEG₄₅-*b*-PnBMA₂₈ diblock aqueous solution at RT and pH=7 with an angle of 90°.

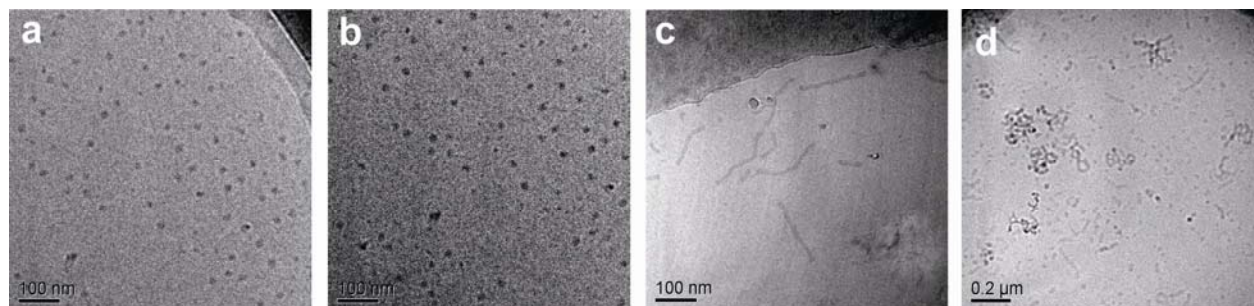


Figure S2. CryoTEM images of aggregates formed from 0.1 wt% EBD terpolymer aqueous solution: (a) pH=4, (b) pH=6, (c) pH=10, and (d) pH=12 in RT.

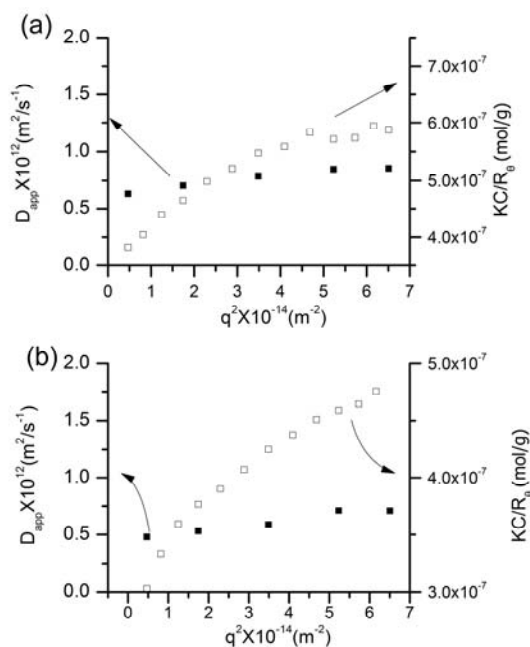


Figure S3. Angular dependent DLS (solid) and SLS (open) measurements performed on EBD aqueous solution (0.1-wt %) at (a) pH=8 and (b) pH=10 at RT.

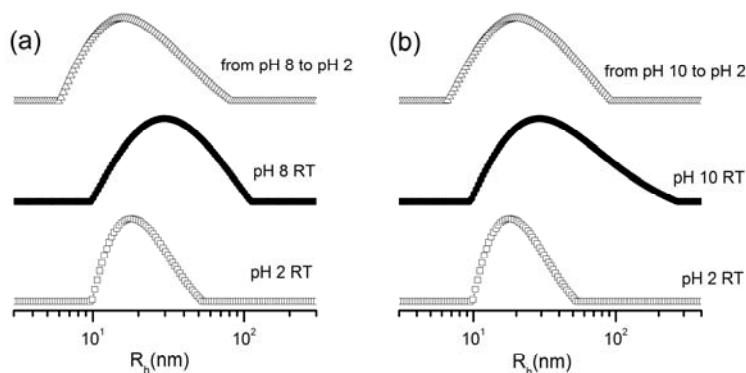


Figure S4. Apparent size distributions of aggregates formed from 0.1-wt% EBD terpolymer aqueous solution upon pH variations in RT at an angle of 90°.

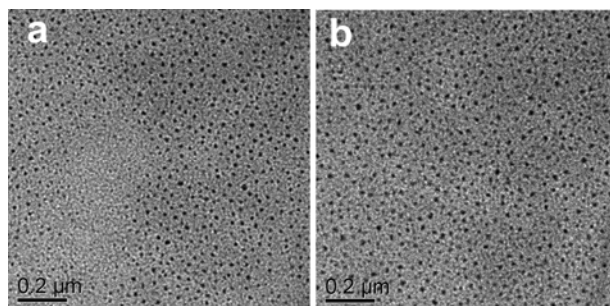


Figure S5. TEM images of aggregates formed from 0.1-wt% EBD terpolymer aqueous solution after adjusting solution from (a) pH = 8 to pH=2, and (b) from pH=10 to pH 2 at RT.

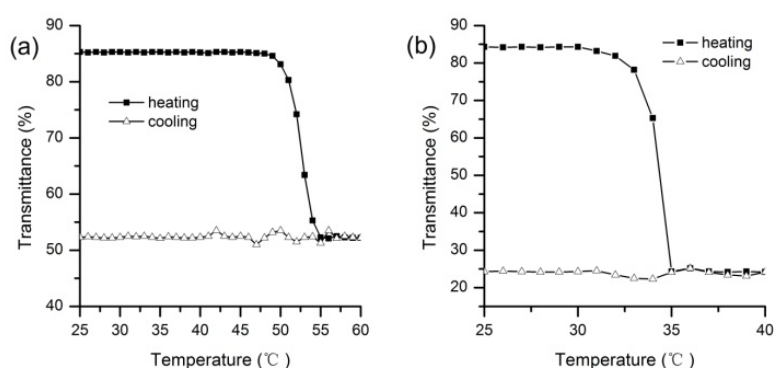


Figure S6. Transmittance of 0.1-wt% EBD terpolymer aqueous solution at (a) pH=8 and (b) pH =10 in a heating/cooling cycle with a heating rate of 1 °C /min.

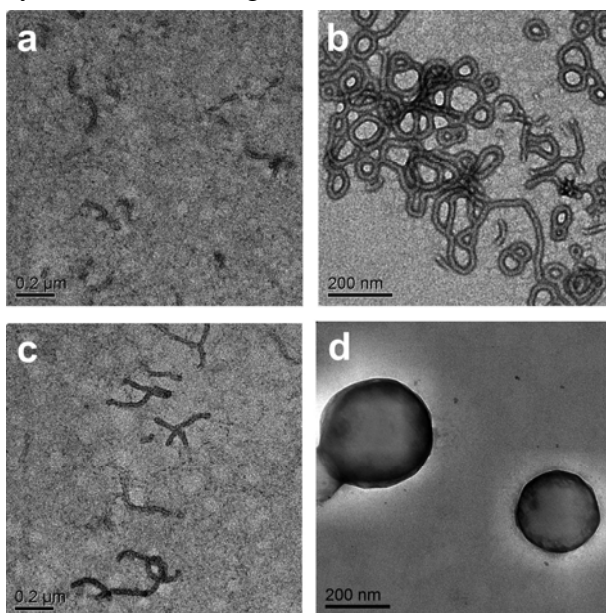


Figure S7. TEM image of of EBD terpolymer aggregates with pH 8 after heating at 55 °C for (a) 0 hour, (b) 1 hour and EBD terpolymer aggregates with pH 10 after heating at 35 °C for (c) 0 hour, (d) 1 hour (stained with uranyl acetate).

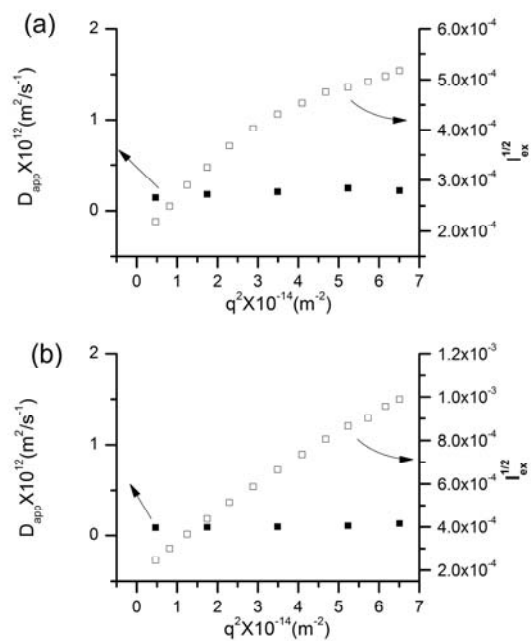


Figure S8. Angular dependent DLS (solid) and SLS (open) measurements performed on EDB solution (0.1 wt %) in RT after heating at (a) 55 °C with pH=8 and (b) 35 °C with pH=10.

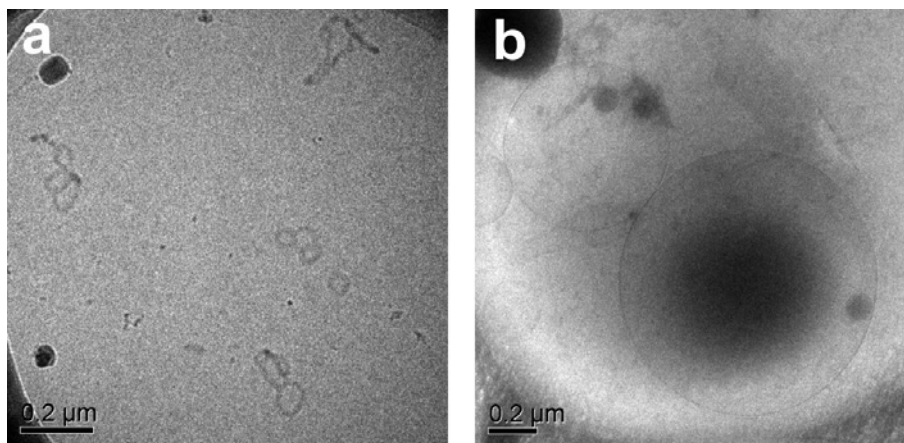


Figure S9. CryoTEM images of toroids and vesicles after 2 months' storage in RT.

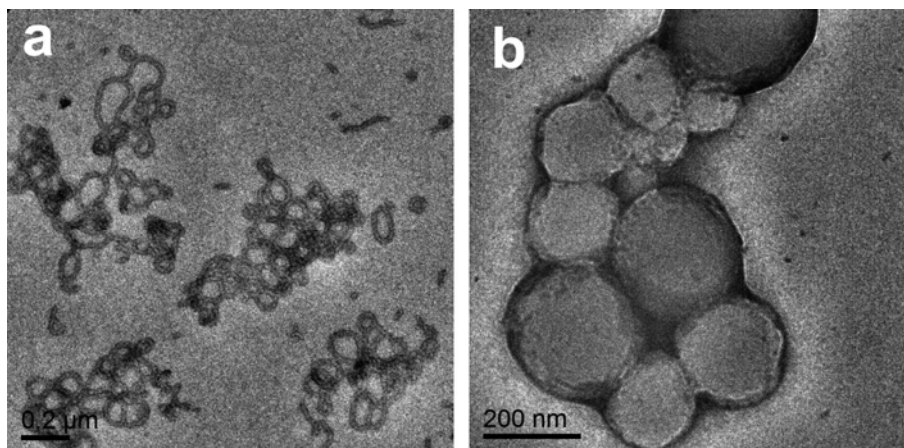


Figure S10. TEM images of assemblies formed EBD solutions after first round of thermal annealing: **(a)** the solution pH was changed from 2 to 8 followed by annealing at 55 ° for one hour, EBD micelle repeated the morphology transition from sphere to cylinder and then to toroid. **(b)** the solution pH was changed from 2 to 10 followed by annealing at 35 ° for one hour, EBD micelle repeated the morphology transition from sphere to cylinder and then to vesicles. (stained with uranyl acetate).

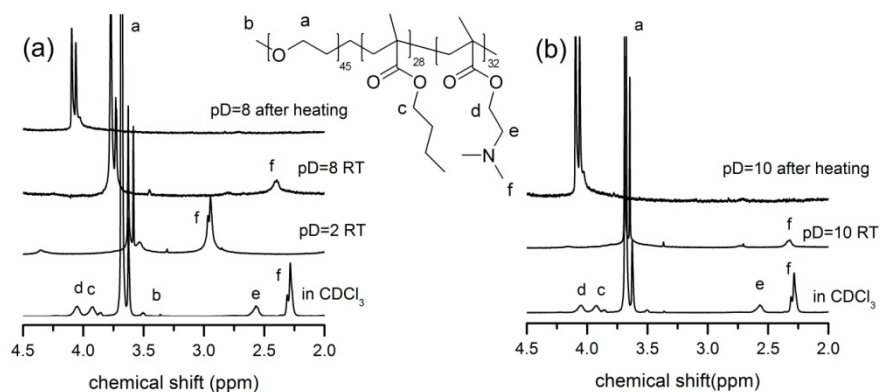


Figure S11. $^1\text{H-NMR}$ spectra of 0.1 wt% EBD terpolymer in (a) CDCl_3 , D_2O with pD 2, pD 8 in RT, pD 8 after heating at 55 °C, (b) pD 10 in RT and after heating at 35 °C.

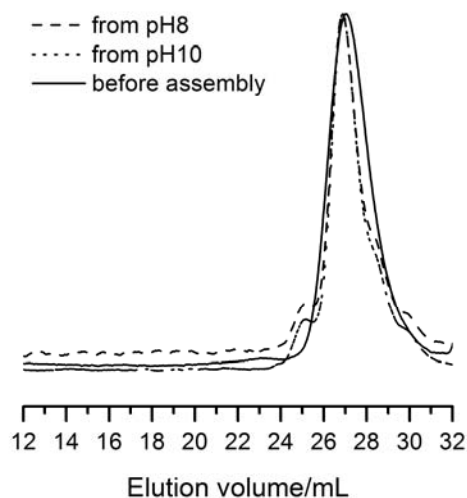


Figure S12. GPC traces of EBD after a transition cycle.

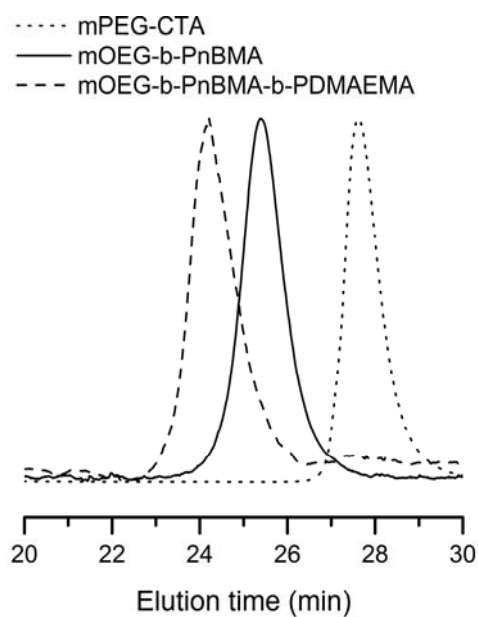


Figure S13. GPC traces of mPEG-CTA ($M_n=3500$, PDI=1.05), EB diblock ($M_n=13800$, PDI=1.08), and EBD triblock ($M_n=35400$, PDI=1.13) copolymers in THF.

(GPC was performed by a set of a Waters 515 HPLC pump and a Waters 2414 refractive index detector. THF was used as an eluent at a flow rate of 1.0 mL/min at 35 °C. Polystyrene standards were used for the calibration.)