Supporting Information

Constructing helical nanowires via polymerization-induced self-assembly

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Abstract: While reliable strategies for constructing block copolymer (BCP) nanowires have been developed, helical nanowires are rarely reported in polymerization-induced self-assembly (PISA). Herein, in this work, a new strategy for constructing helical nanowires was developed via PISA mediated by a fluorinated stabilizer block. Ultralong nanowires with helical structure can be readily produced in a wide range of block compositions. In addition, the generality of this strategy was well testified by expanding monomer types. The achiral BCP nano-objects underwent a morphology transition from spheres to helical nanowires during aging. We believe this work will provide a general strategy for producing helical nanowires through PISA of achiral BCPs.

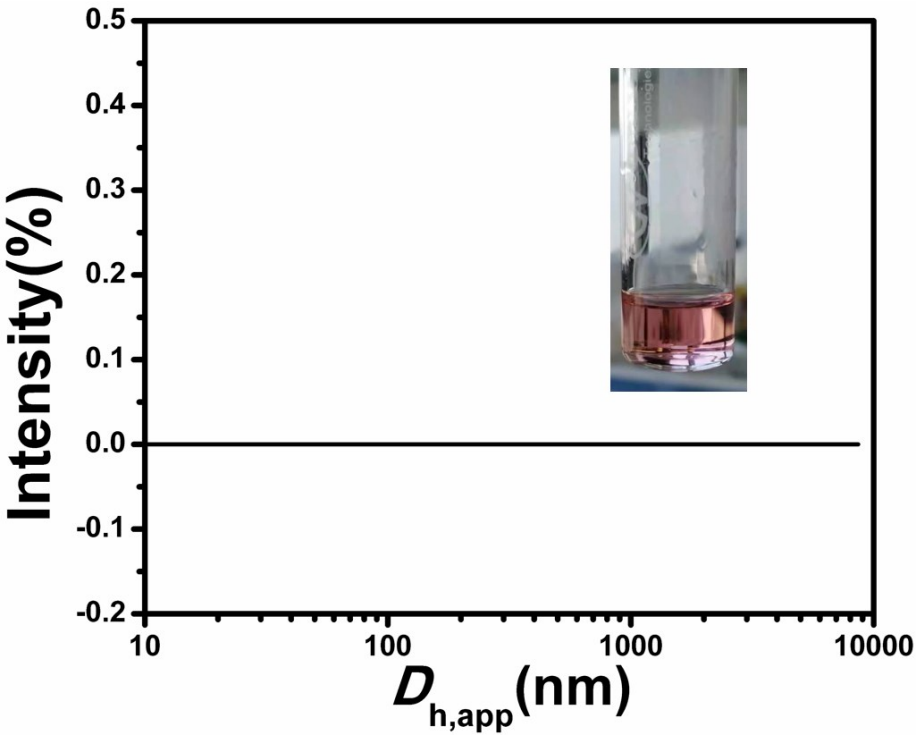


Figure S1. DLS result of P(DMAEMA$_{27}$-*co*-TFEMA$_3$)-CTA ethanol solution with the polymer concentration of 60 mg mL^{-1}. As the inset image shown, the polymer solution was clear and transparent, indicating that no colloidal dispersion formed.

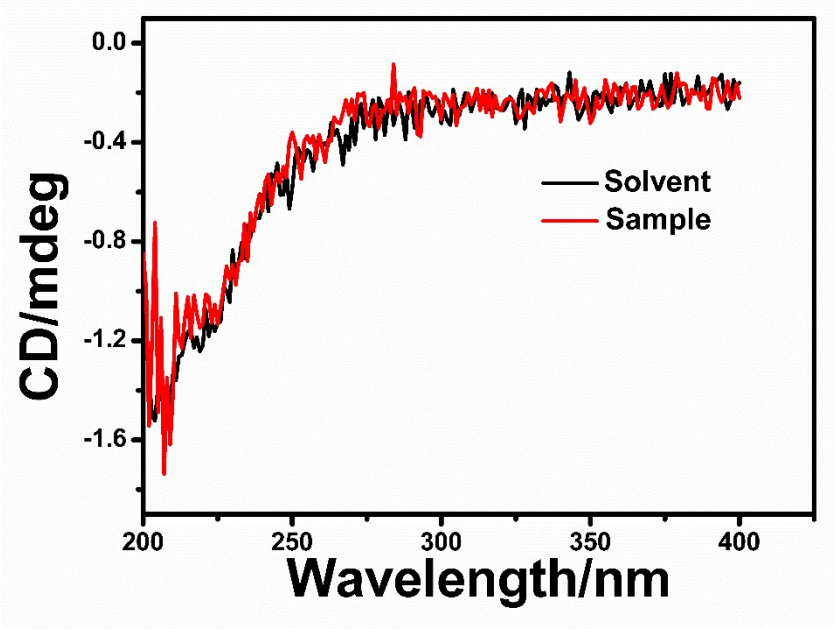


Figure S2. CD spectra of P(DMAEMA$_{27}$-*co*-TFEMA$_3$)-*b*-PFHEMA$_{20}$ nanowire helices ethanol solution in 1 cm quartz cell.

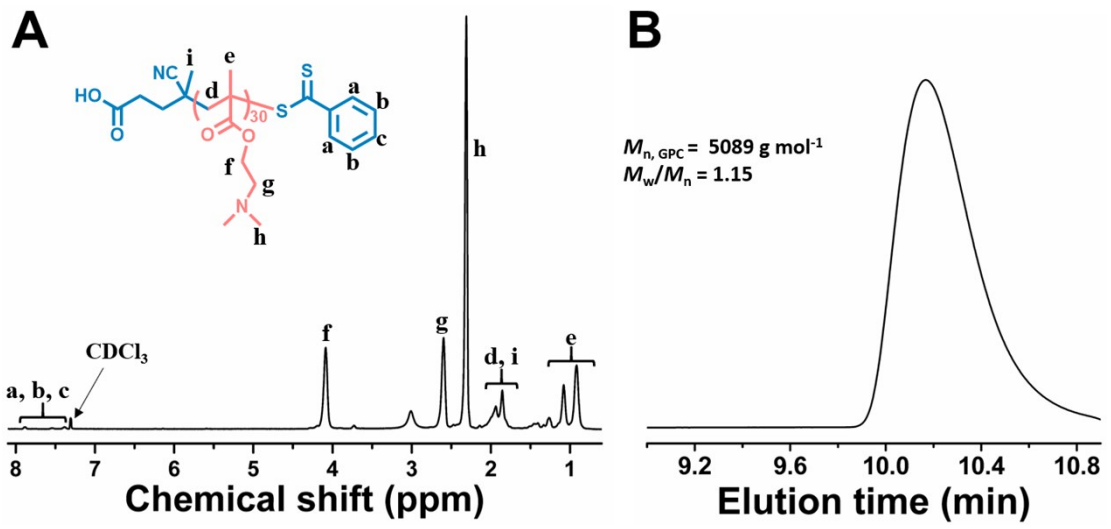


Figure S3. A) ^{1}H NMR spectrum of PDMAEMA$_{31}$-CTA in $CDCl_3$; B) GPC trace of PDMAEMA$_{31}$-CTA using THF as the eluent.

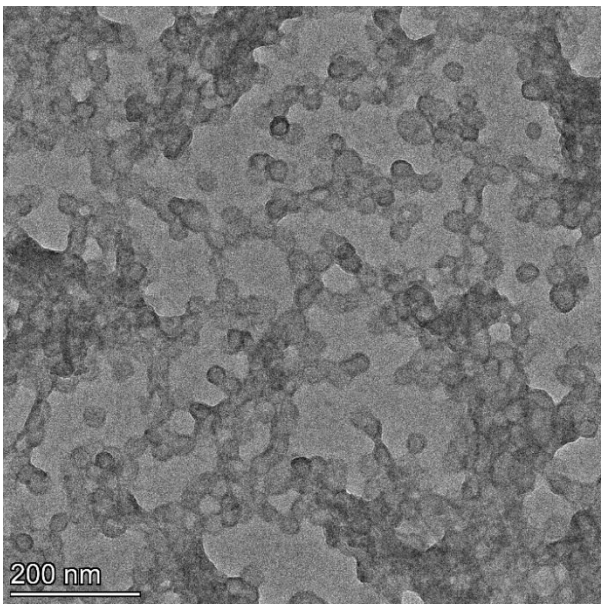
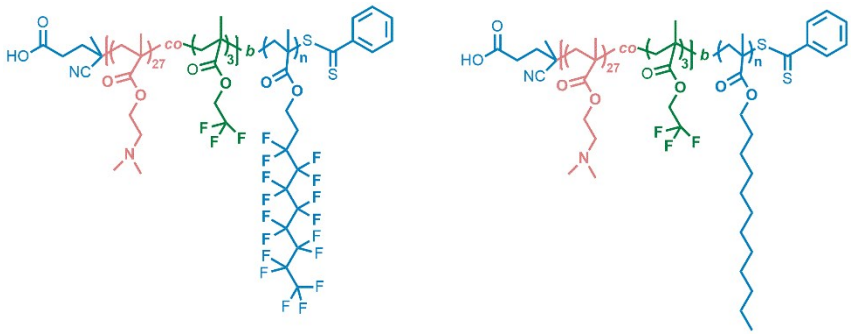


Figure S4. TEM micrograph of PDMAEMA$_{31}$-*b*-PFHEMA$_{30}$ nano-objects. The TEM sample was prepared after aging for 7 days.



Scheme S1. Chemical structures of P(DMAEMA$_{27}$-*co*-TFEMA$_3$)-*b*-PHDFDMA$_n$ (left) and P(DMAEMA$_{27}$-*co*-TFEMA$_3$)-*b*-PLMA$_n$ (right) BCPs.

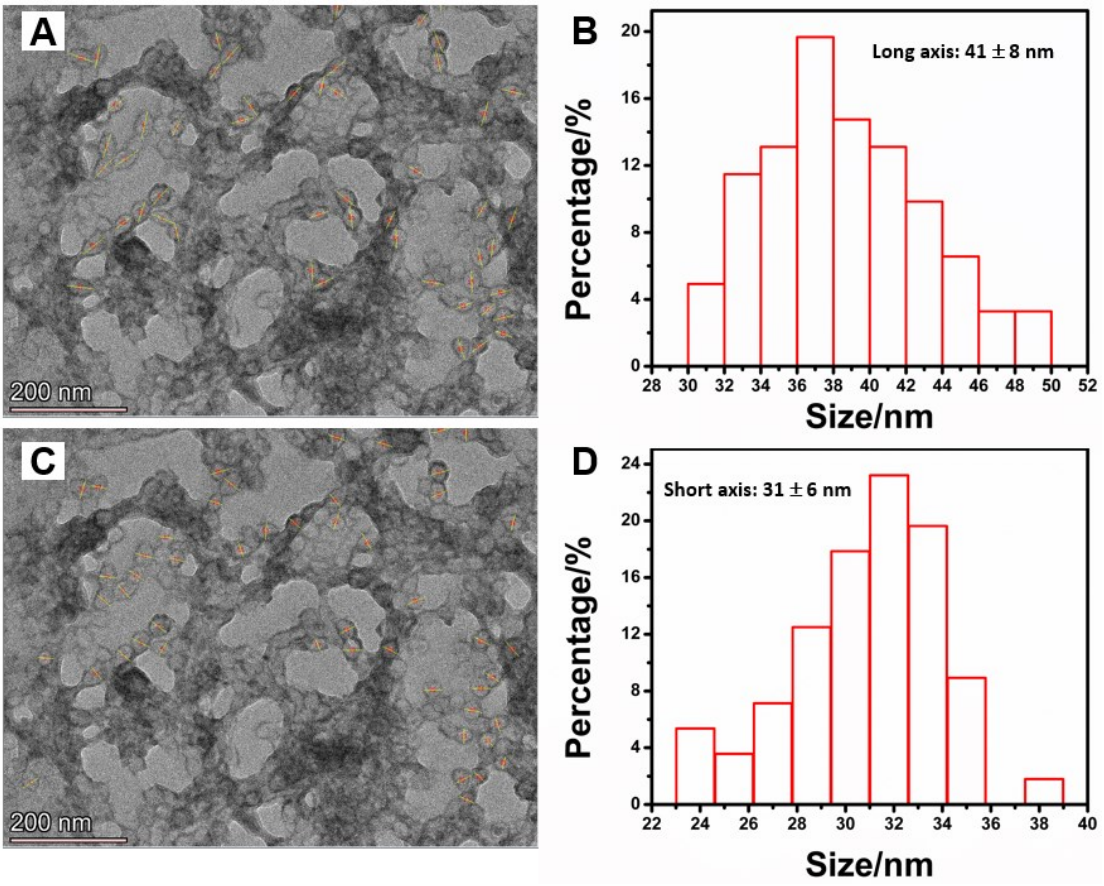


Figure S5. Statistical analysis of long axis (A and B) and short axis (C and D) of P(DMAEMA$_{27}$-*co*-TFEMA$_3$)-*b*-PHDFDMA$_{30}$ ellipsoidal nanoparticles.