Supporting Information

Chirality reversed and enhanced by pH-sensitive surfactant self-assembly

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1 Experimental

1.1 Materials

All the chemicals were purchased from Sigma-Aldrich, Energy Chemical and Innochem. All chemicals were used as received, and all solutions were prepared with deionized water (18 MΩ·cm).

1.2 Synthesis and characterization of chiral N-Tetradecanoyl-Alanine

1.2.1 Synthesis. Both TD-L-AlaA and TD-D-AlaA were synthesized according to the previous publication.[1]

1.2.2 Characterizations. ^{1}H NMR spectra were recorded on a Bruker Advance III 400 (400 MHz) spectrometer. Mass spectra were performed on Q-Exactive mass spectrometry instrument. XRD analysis was performed on D/MAX-TTRIII(CBO) X-ray diffractometer. UV spectra were obtained on LAMBDA650 spectrophotometer. TEM and AFM images were captured with a Tecnai G2 20 S-TWIN operating at an acceleration voltage of 200 kV and Bruker Multimode-8, respectively. The pH measurements were performed with METTLER TOLEDO pH meter FE20. PL spectra were measured by NanoLOG-TCSPC. JASCO J-1500 CD spectrometer was used to obtain CD spectra. CPL measurements were performed with a JASCO CPL-200 spectrometer.

1 CD analysis

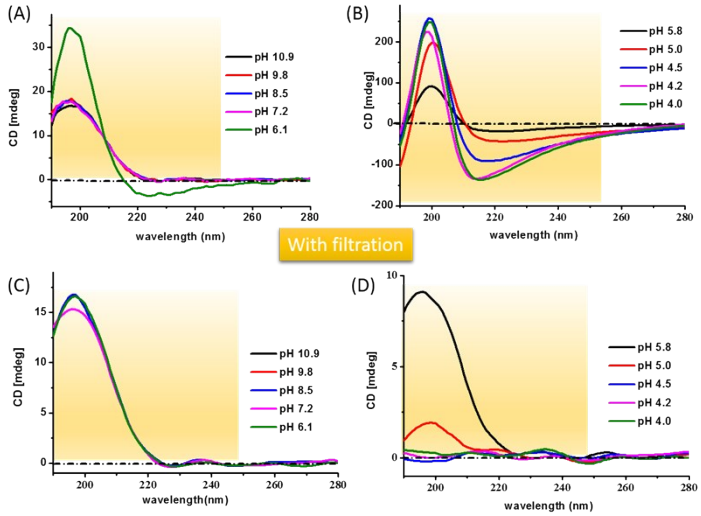

Fig. S1 CD spectra for 0.15mM TD-D-AlaA at different pH (A) (B) without filtration and (C) (D) after filtration.

2 Morphology analysis

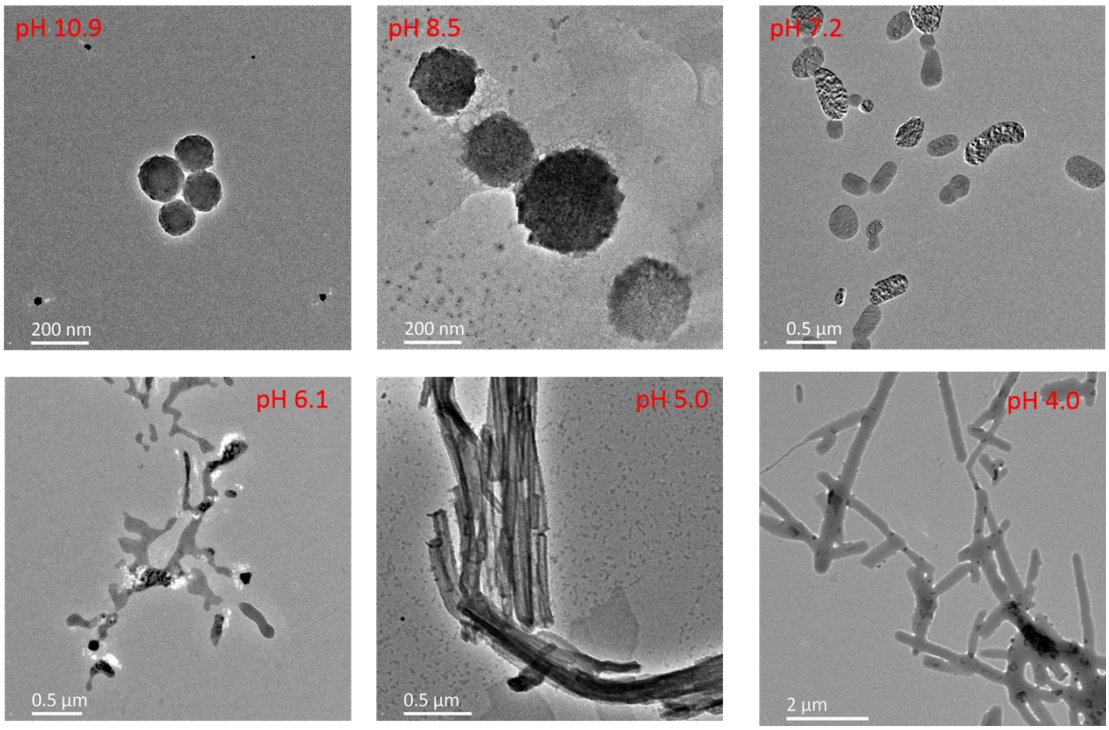

Fig. S2 TEM images for 0.15mM TD-D-AlaA in different pH.

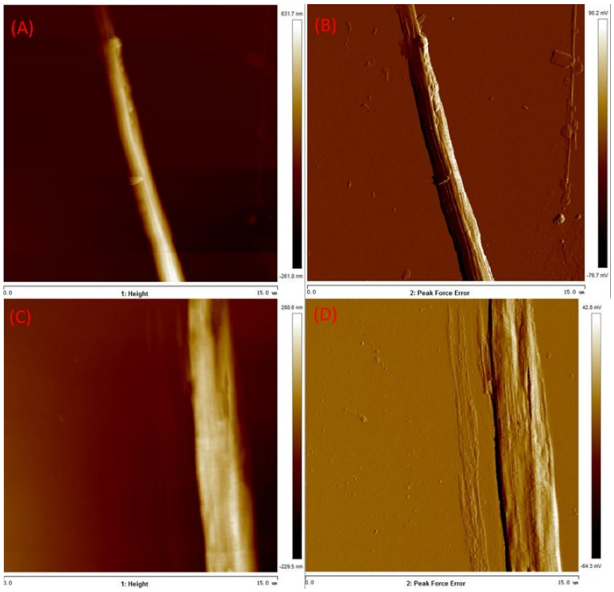

Fig. S3 Height and peak force error AFM images for 0.15mM (A) (B) TD-L-AlaA and (C) (D) TD-D-AlaA at pH 4.0.

3 Repeatable analysis

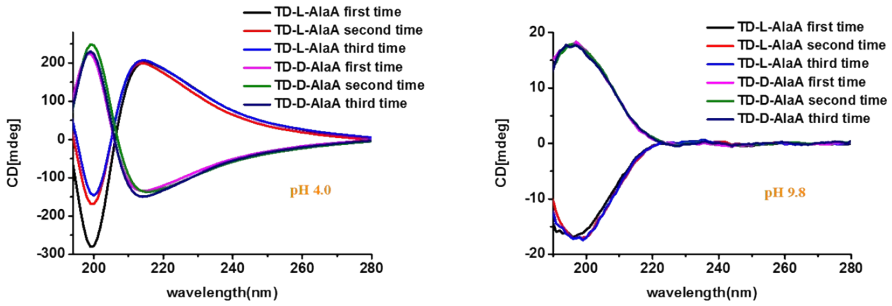

Fig.S4 CD spectra of TD- L/D-AlaA at (A) pH 4.0 and (B) pH 9.8.

4 XRD analysis

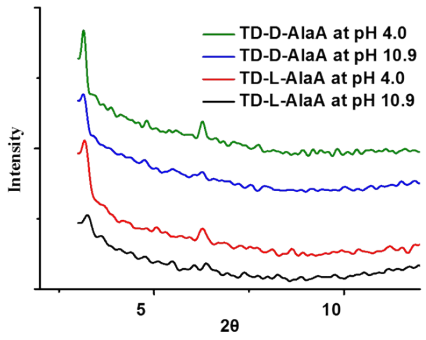

Fig. S5 XRD analysis of TD-AlaA at different pH.

5 DLS analysis

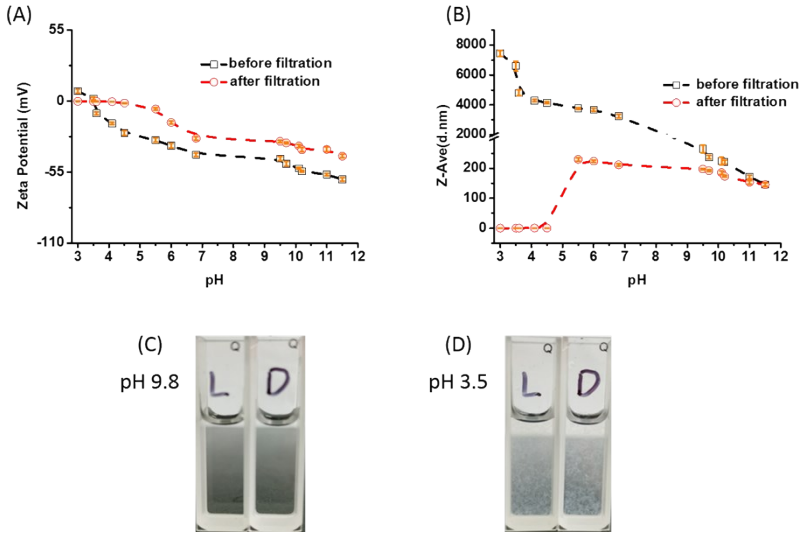

Fig.S6 (A) Zeta potential and (B) size for 0.15mM TD-D-AlaA at different pH measured by DLS before and after filtration.

6 CPL analysis

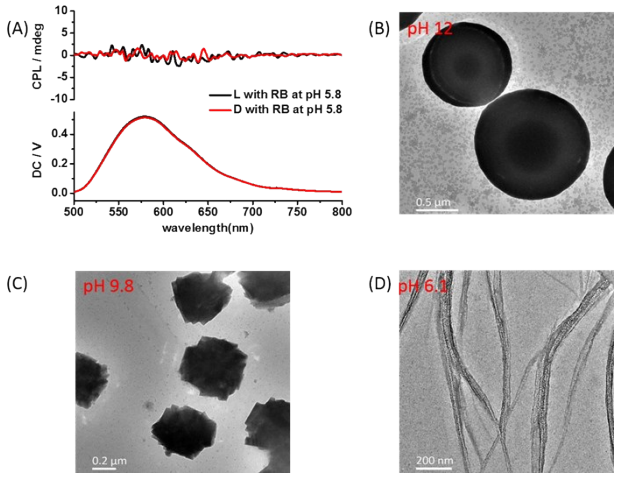

Fig.S7 (A) CPL spectra for TD-AlaA$^-$ and Rhodamine B at pH 5.8; (B) (C) (D) TEM of TD-D-AlaA with Rhodamine B at different pH.

7 UV analysis

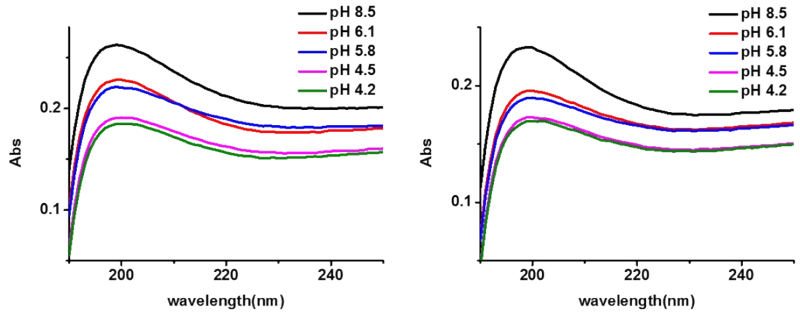

Fig.S8 UV spectra of TD- L/D-AlaA at different pH.

8 Molecular composition analysis

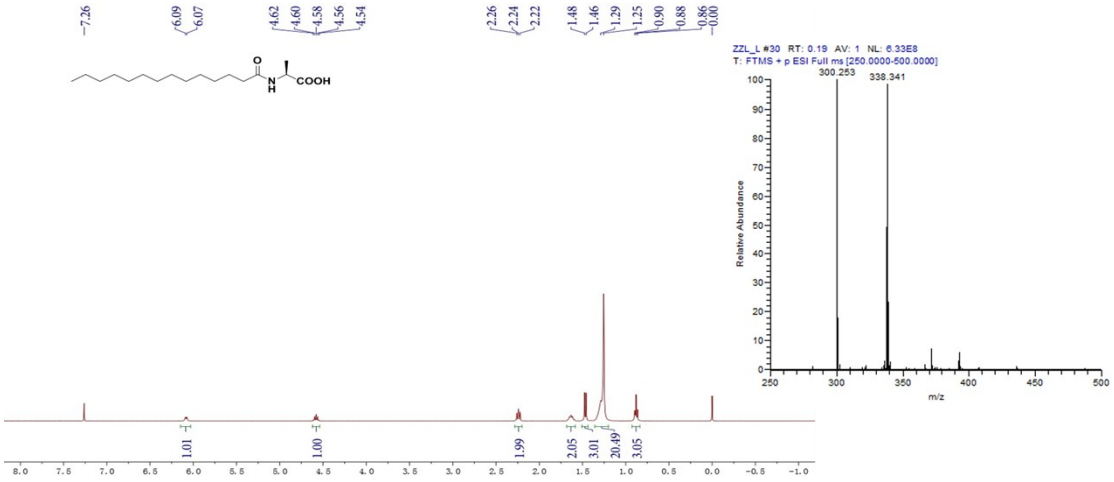

Fig.S9 NMR and MS spectra of TD-L-AlaA.

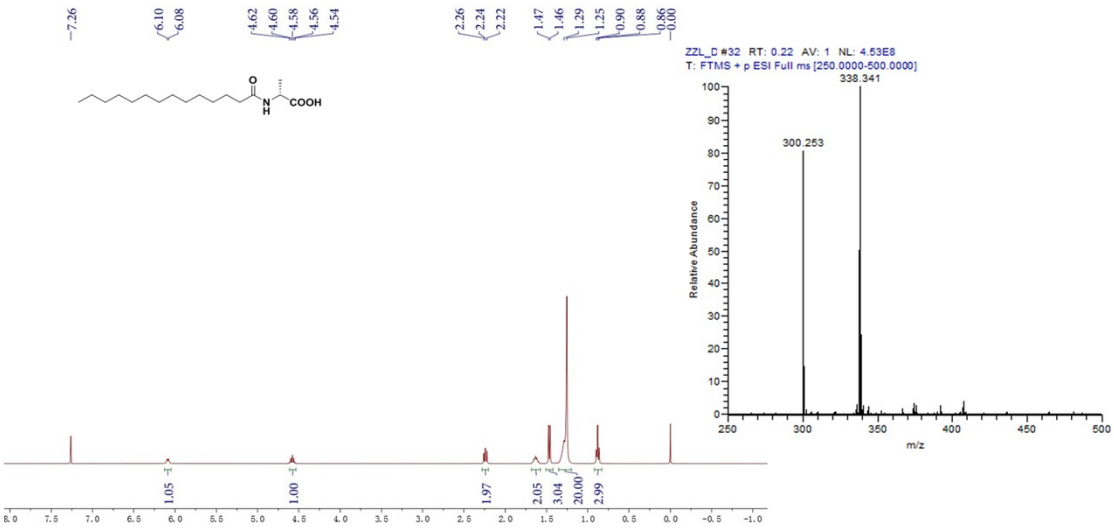

Fig.S10 NMR and MS spectra of TD-D-AlaA.

Notes and references

1. Y. X. Li, S. G. Fu, J. H. Zhang, S. M. Xie, L. Li, Y. Y. He, M. Zi and L. M. Yuan, *J Chromatogr A*, 2018, **1557**, 99-106.