Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting information

Polydopamine/Hydroxyapatite Nanowires-based Bilayer Membrane for Photothermal-driven Membrane Distillation

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Supporting information

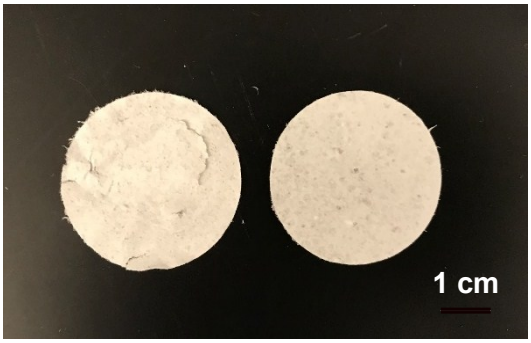

Figure S1. Photographs of broken HA-CS film fabricated using HA suspension with 5% CS (left) and intact HA-CS film obtained from HA suspension with 10% CS (right).

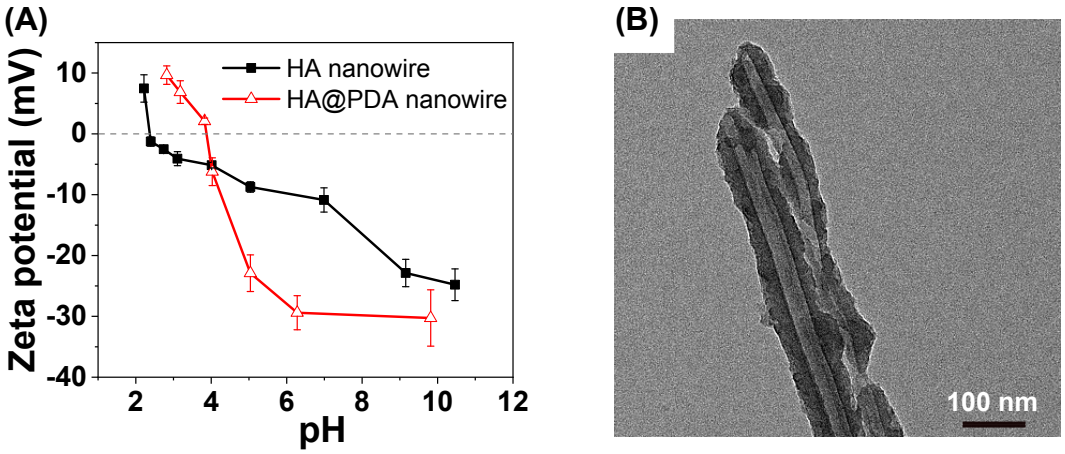

Figure S2. (A) Zeta potential of HA nanowires and HA@PDA nanowires (all points have error bars but some of error bars are smaller than the symbols). (B) TEM image of PDA hollow tubes.

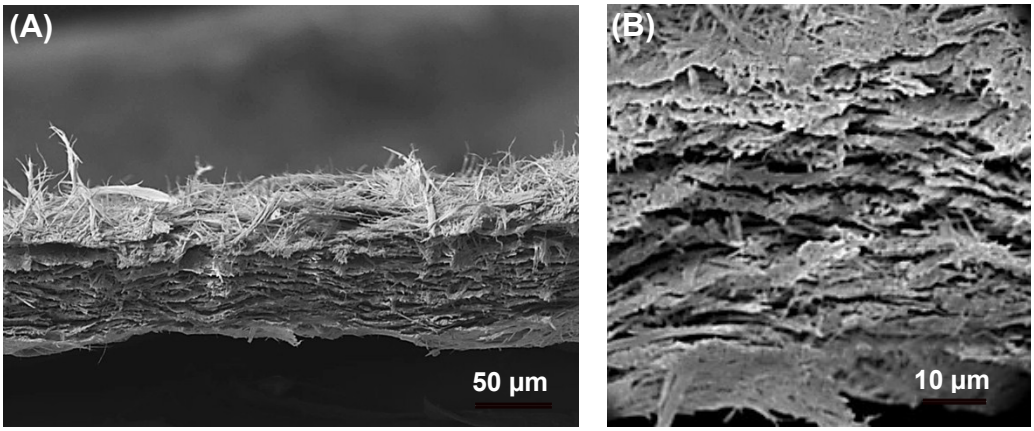

Figure S3. The cross-section SEM images of the HA@PDA film in low magnification (A) and high magnification (B).

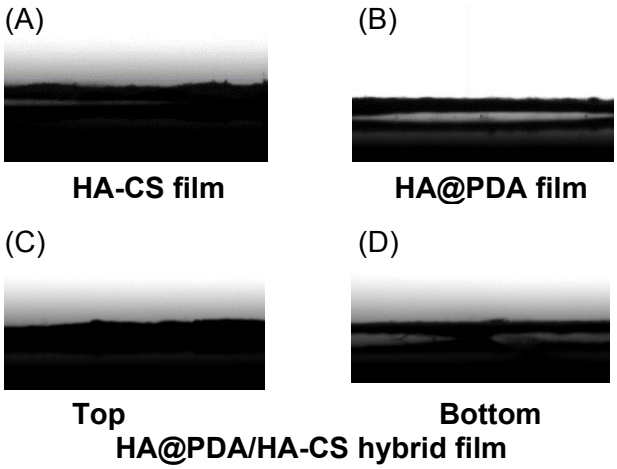

Figure S4. Contact angle of representative (A) HA-CS film, (B) HA@PDA film, and (C) top and (D) bottom of HA@PDA/HA-CS bilayered film before FTCS treatment.

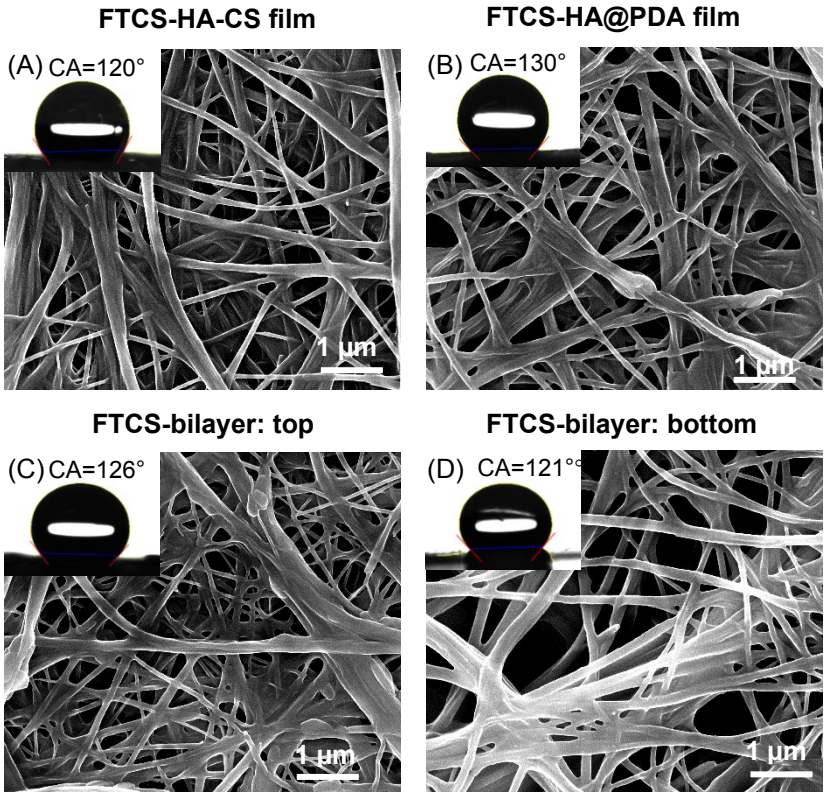

Figure S5. SEM images of representative HA-CS film (A), HA@PDA film (B), and top (C) and bottom (D) of HA@PDA/HA-CS bilayered film after FTCS treatment (insets are the contact angles for the corresponding films).

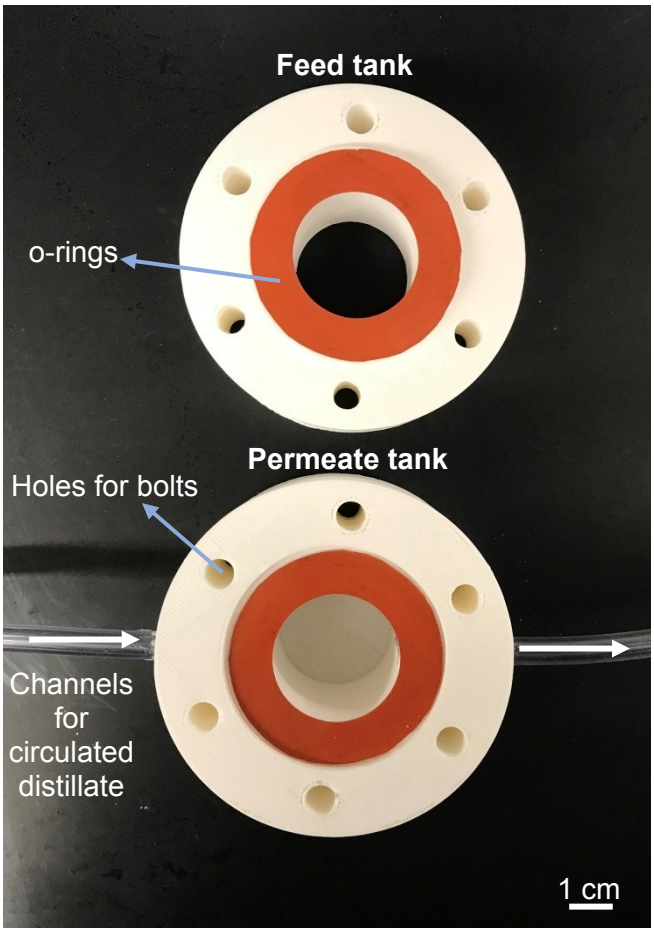

Figure S6. Photograph of a 3D-printing module of DCMD for PMD test, comprising of the feed tank and permeate tank. 0.5 M NaCl solution at ambient temperature (20 °C) was circulated at a speed of 3.6 ml•min^{-1} in the feed tank. During PMD test, the feed tank was exposure to simulated sunlight. The distillate at room temperature with a flow rate of 16.2 ml•min^{-1} was circulated in the permeate tank. The photothermal membrane was placed between two pieces of silicone-rubber o-rings to avoid leakage, which was fixed between the feed tank and permeate tank, respectively. Bolts and nots were placed in the holes of the feed tank and permeate tank for fixing, respectively.

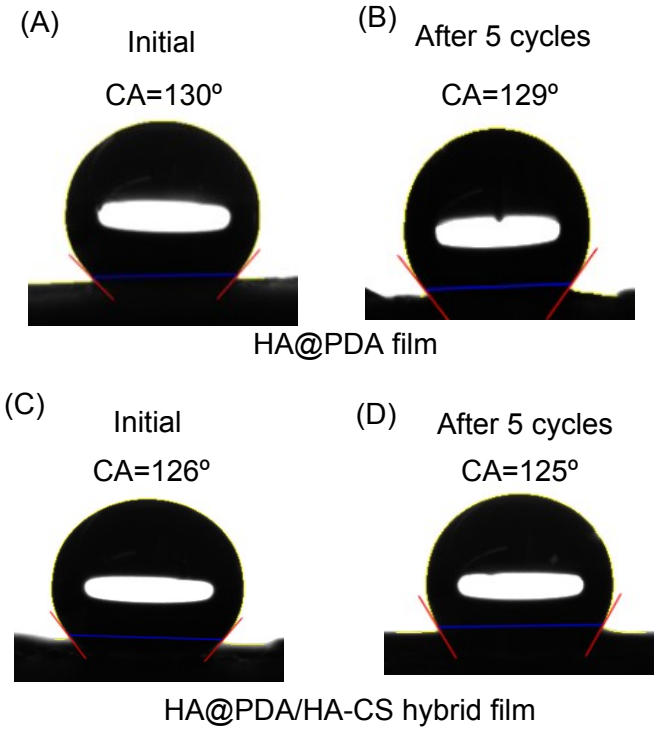

Figure S7. Contact angle of representative HA@PDA film before PMD test (A) and after (B) 5 cycles PMD test. Contact angle of HA@PDA/HA-CS bilayered film before PMD test (C) and after (D) 5 cycles PMD test.

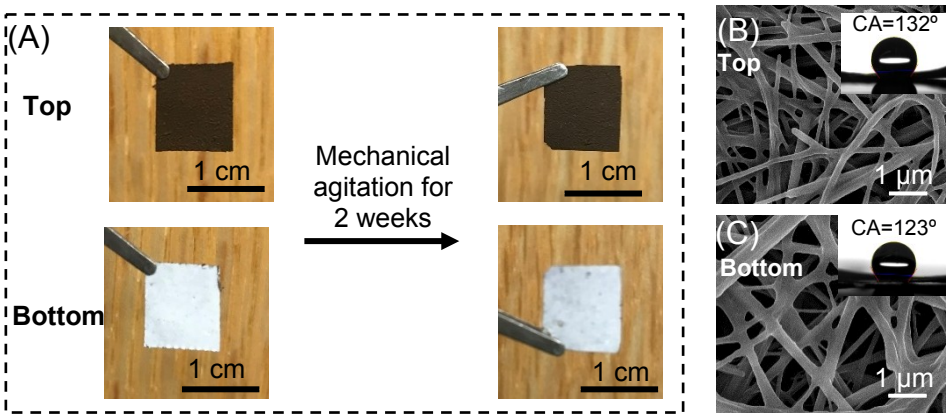

Figure S8. Photographs (A) and SEM images (B-C) of the top and bottom layer of HA@PDA/HA-CS film after mechanical agitation for 2 weeks (insets of SEM images are the contact angles for the corresponding film). The film with length of 1 cm and width of 1 cm was placed in a 50 ml test tube filled with water and subjected to a tube rotator for mechanical agitation.