Electronic Supplementary Material (ESI) for Polymer Chemistry.

Supporting Information

Antibacterial Peptide Decorated Nano-Structures Prepared through Polymerization Induced Self-Assembly (PISA)

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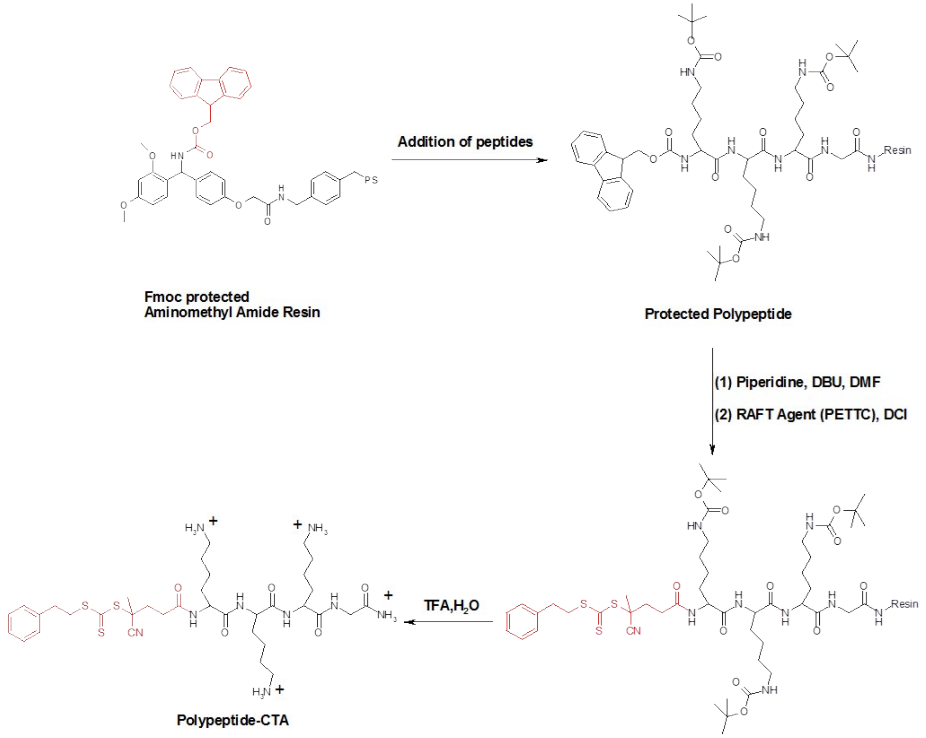


Scheme S1. Synthesis of the polypeptide macro-CTA (Lys-Lys-Lys- Gly-NH_2 macro-CTA) using classical solid phase peptide synthesis (SPPS).

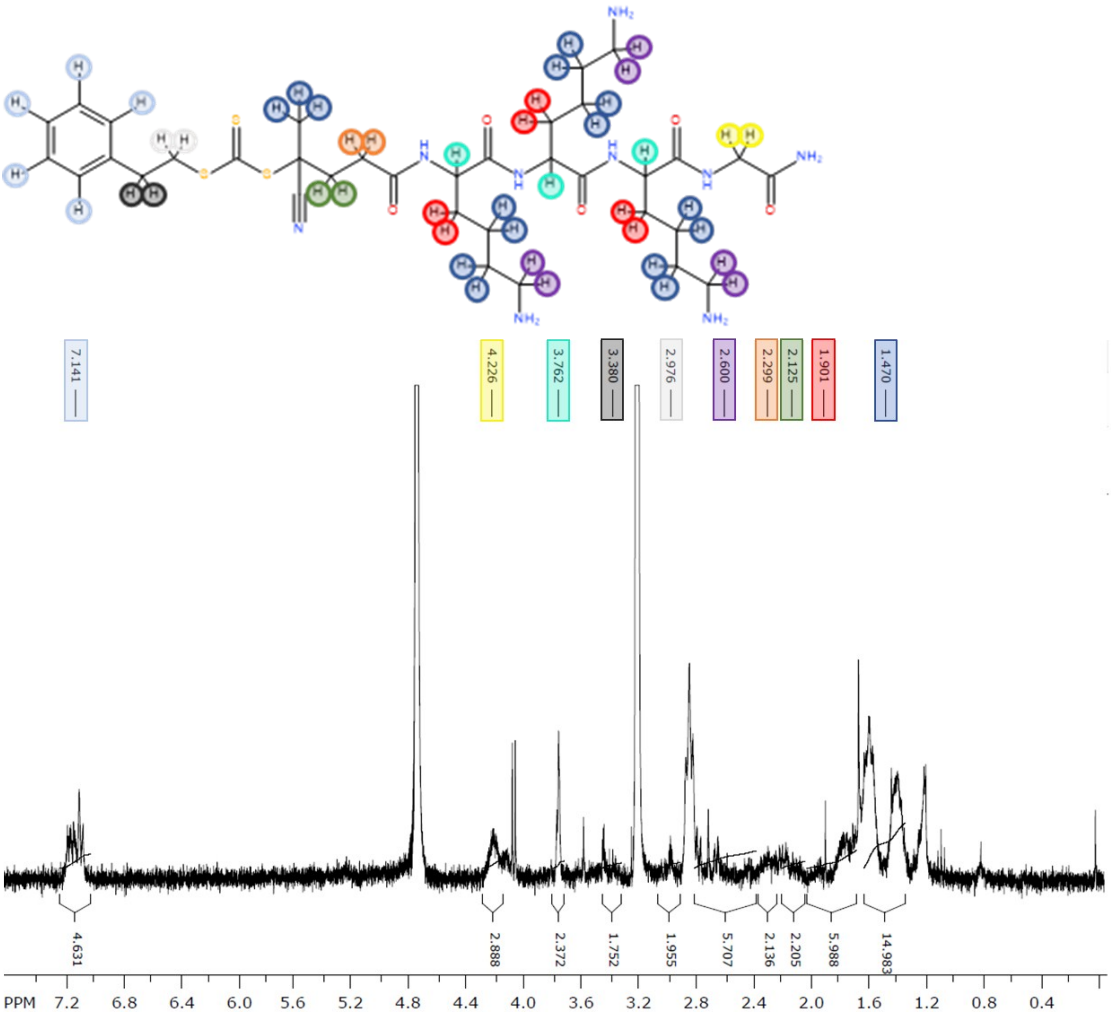


Figure S1. ^{1}H NMR spectrum of polylysine macro-CTA obtained in D_2O.

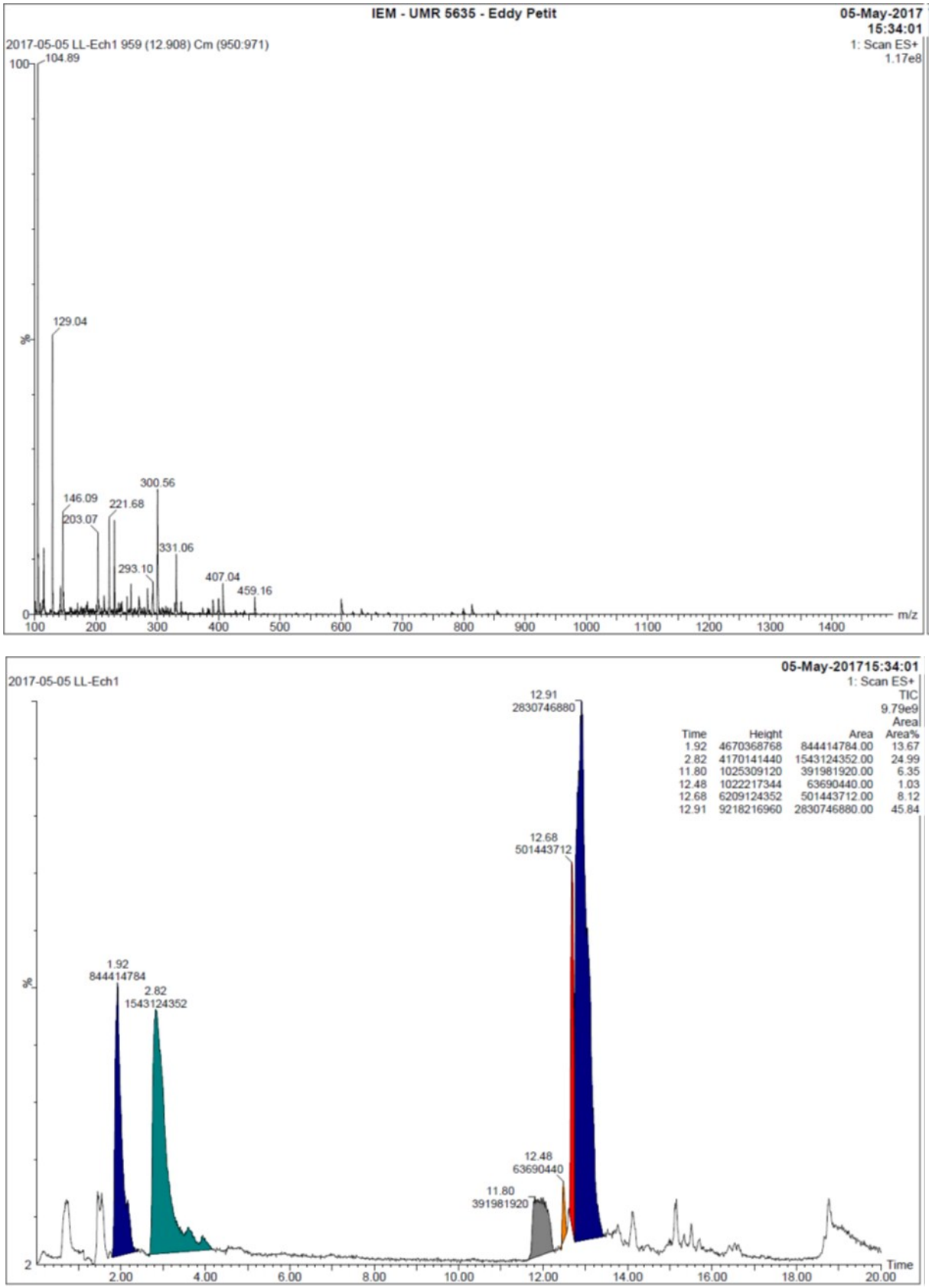


Figure S2. LCMS of polylysine macro-CTA.

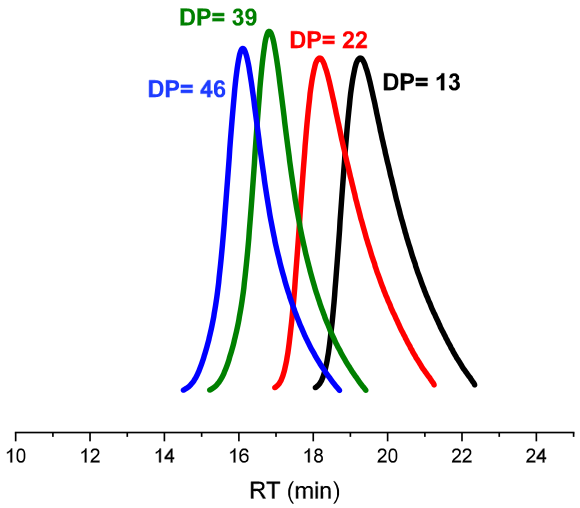


Figure S3. Gel permeation chromatograms (DMF eluent, refractive index detector) obtained for aqueous RAFT dispersion polymerization of HPMA at 10% w/w solids at 60 °C using the polylysine macro-CTA.

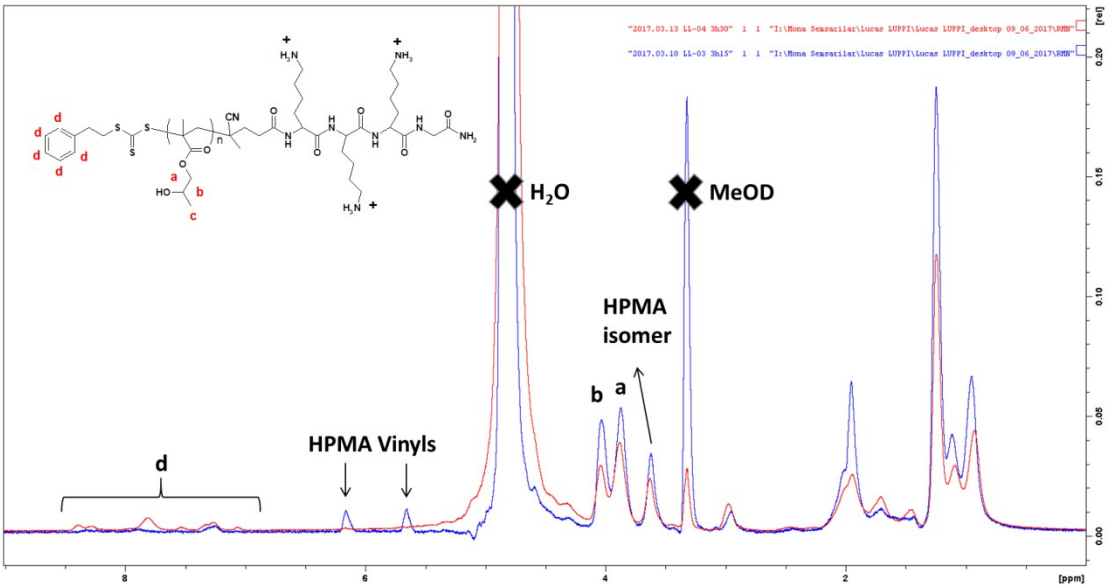


Figure S4. ^{1}H NMR spectra in methanol-d_4 for polylysine-PHPMA at 85% (blue) and 100% (red) conversion of HPMA (Target DP of 50 at 10% w/w solids at 60 °C using the polylysine macro-CTA).

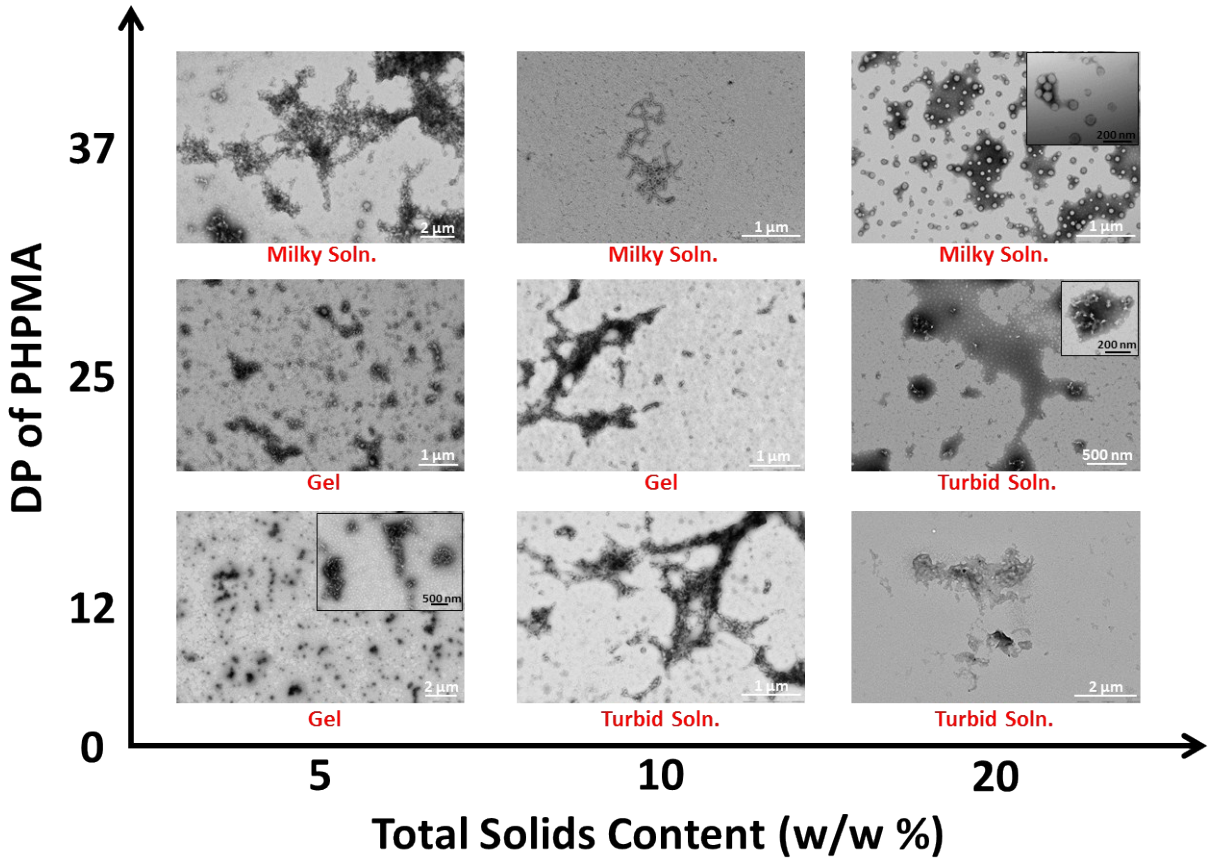
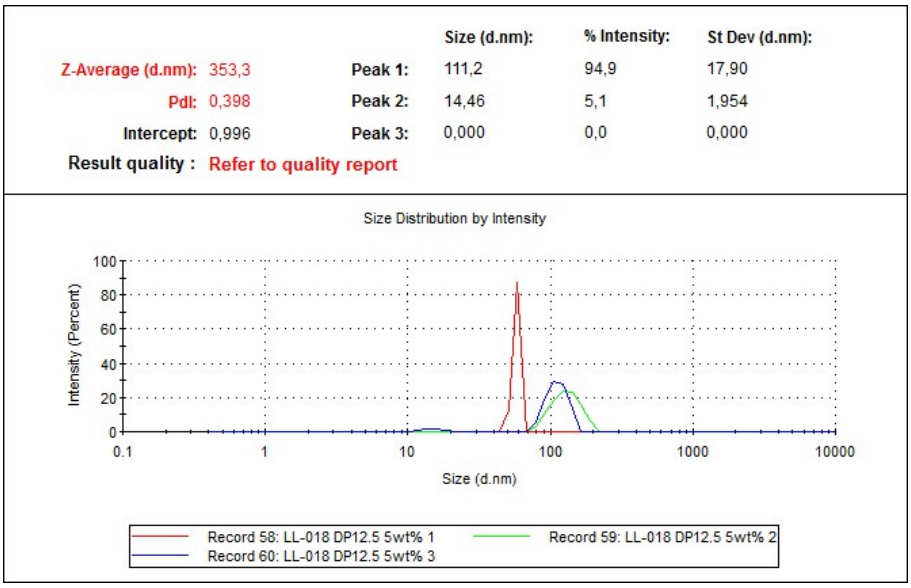
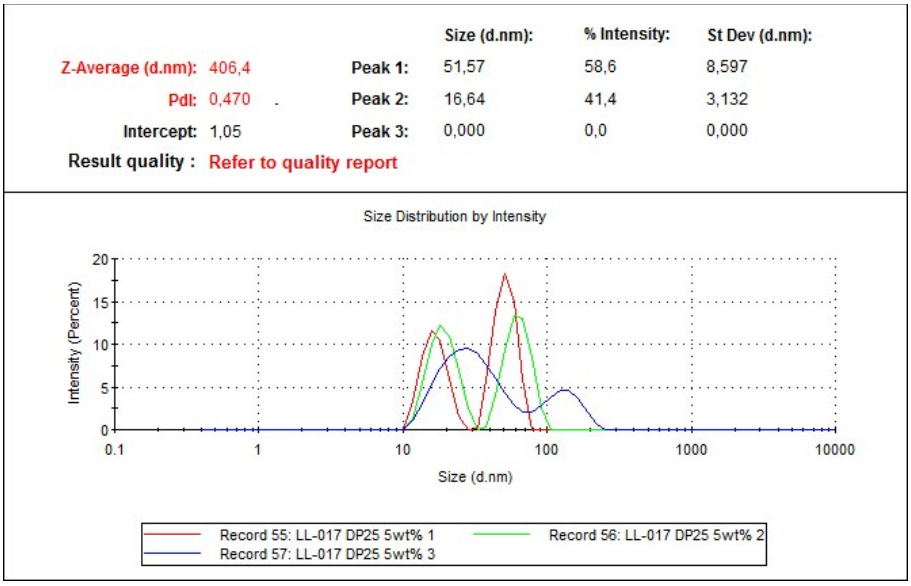


Figure S5. Post mortem TEM images obtained for Polypeptide-*b*-PHPMA$_x$ diblock copolymer nanoparticles in water.

(a)



(b)



(c)

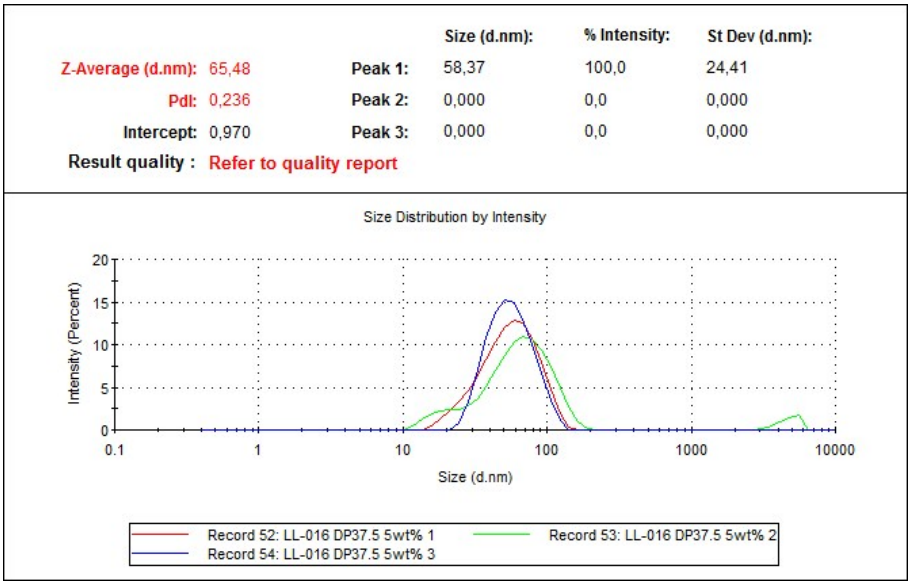


Figure S6. Dynamic light scattering particle size distributions obtained for Polypeptide-*b*-PHPMA$_x$ diblock (originally prepared at 20 w/w %) copolymer nanoparticles in water at 0.1 w/w % (a) x=12 (b) x=25 (c) x=37. Different colors correspond to 3 different consecutive measurements on the same sample.

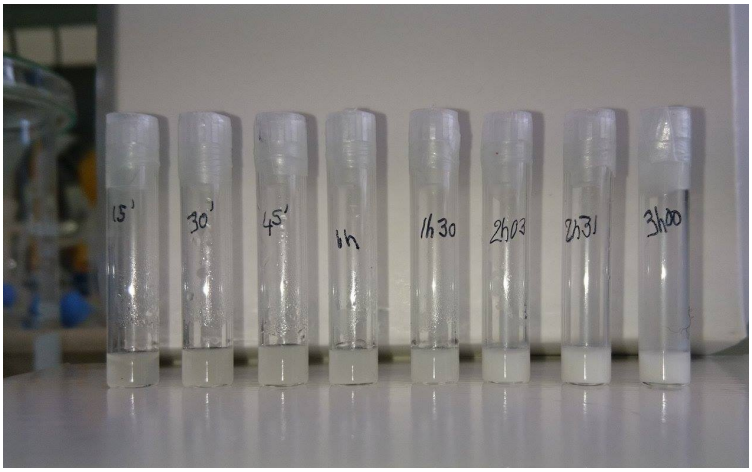


Figure S7. Changes observed in solution turbidity during RAFT aqueous dispersion polymerization of HPMA (target DP of 50) using the polypeptide-mCTA at 60 °C and 10 w/w %.

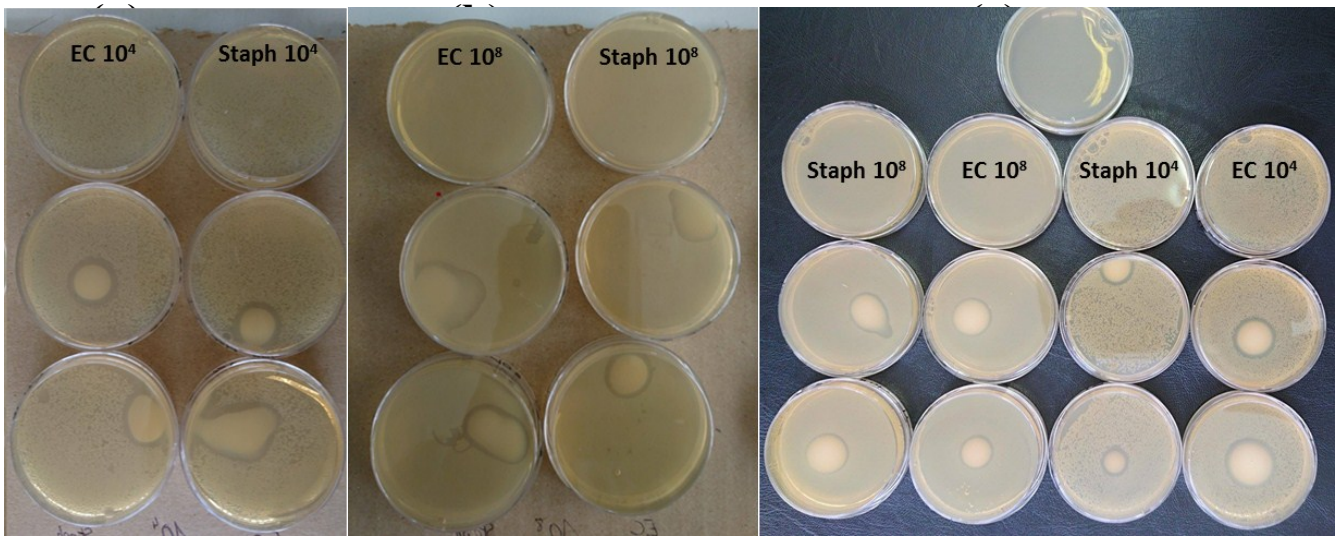


Figure S8. Agar diffusion tests against *Escherichia coli* (EC) and *Staphylococcus epidermidis* (Staph) at 10^8 and 10^4 CFU.mL^{-1} (a, b) polypeptide-CTA and (c) polypeptide. In (a,b), the first row shows the positive control (bacteria alone) while the two other rows are the antibacterial tests with polypeptide-CTA (reproduced twice). In (c), the first row corresponds to the negative control (no bacteria and no material), the second row corresponds to the positive control (bacteria alone) and the two last rows are the antibacterial tests with polypeptide (reproduced twice).

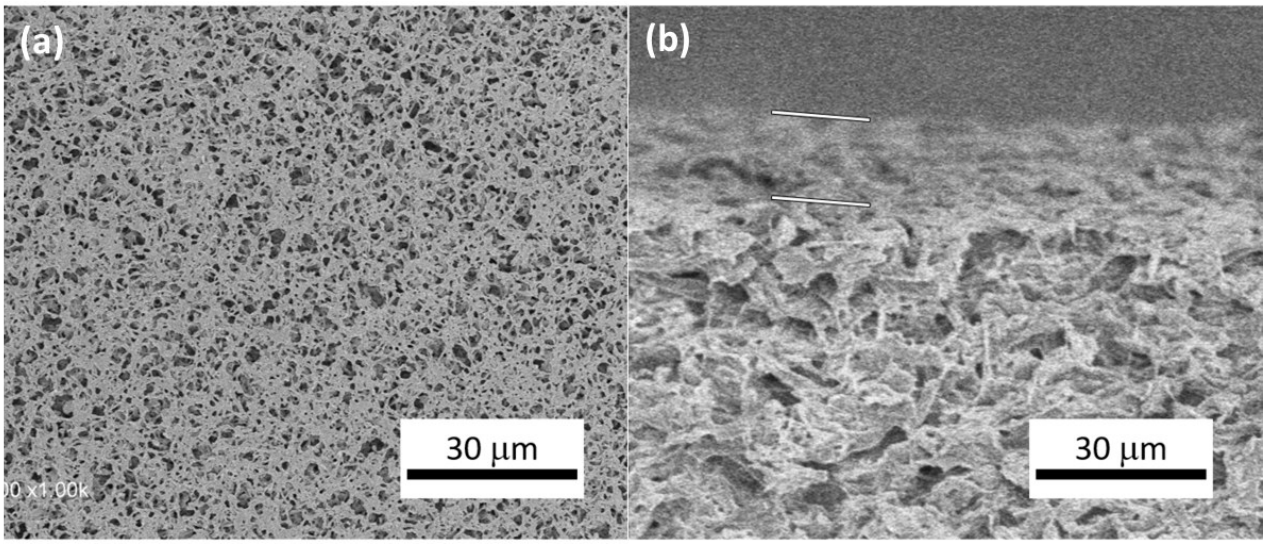


Figure S9. SEM images of (a) Nylon support (0.2 µm) (b) cross section of the thin film membrane prepared on Nylon support using Polylysine-*b*-$PHPMA_{12}$ at 10 % w/w using spin-coating.