Electronic Supplementary Information for *Soft Matter* manuscript:

New Non-spherical Morphologies from Cross-Linked Biomimetic Diblock Copolymers Using RAFT Aqueous Dispersion Polymerization

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Figures in Supporting Information

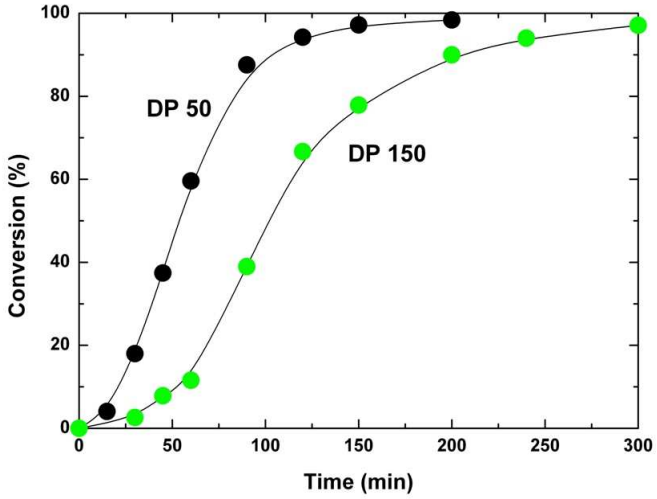

Fig. S1 Conversion vs. time curves for the aqueous RAFT polymerization of MPC at target degrees of polymerization of 50 and 150 in the presence of $NaHCO_3$ at 70 °C. For more detailed polymerization conditions, see Experimental Section.

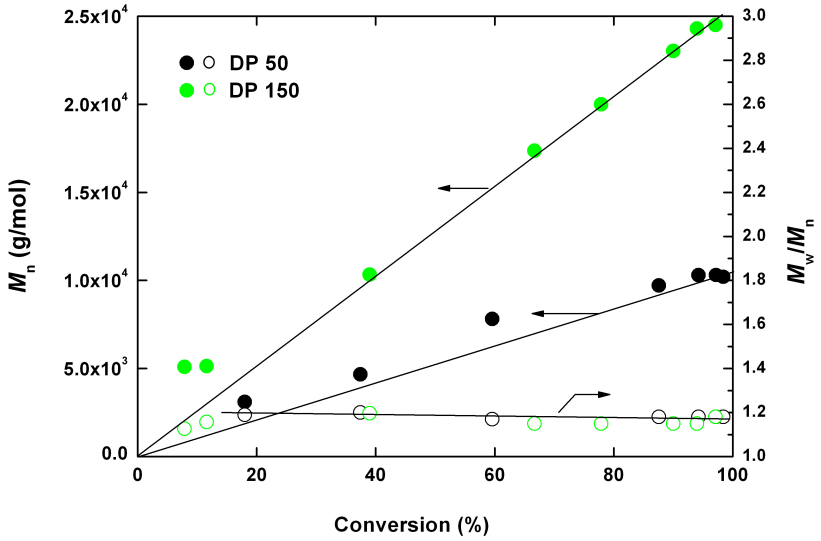

Fig. S2 Evolution of M_n and M_w/M_n with conversion for the aqueous RAFT polymerization of MPC at target degrees of polymerization of either 50 or 150 in the presence of $NaHCO_3$ at 70 °C. For more detailed polymerization conditions, see Experimental Section.

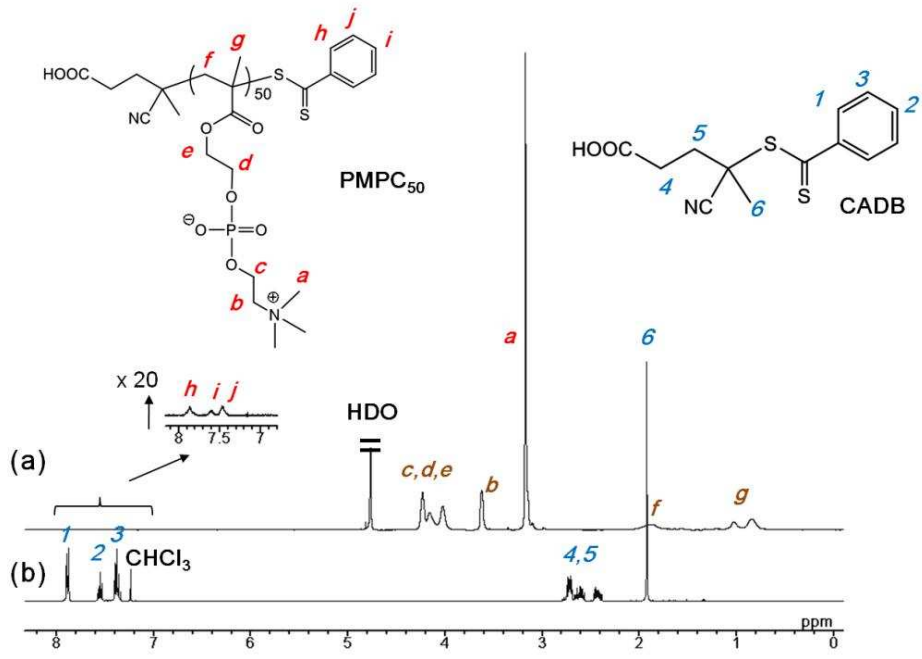

Fig. S3 Typical ^{1}H NMR spectra recorded for (a) $PMPC_{50}$ macro-CTA in D_2O and (b) CDAB in $CDCl_3$ at 25°C as a reference. The inset shows the chemical structures of $PMPC_{50}$ macro-CTA and CADB with full peak assignments (***a*** – ***j*** for PMPC and ***1-6*** for CDAB).

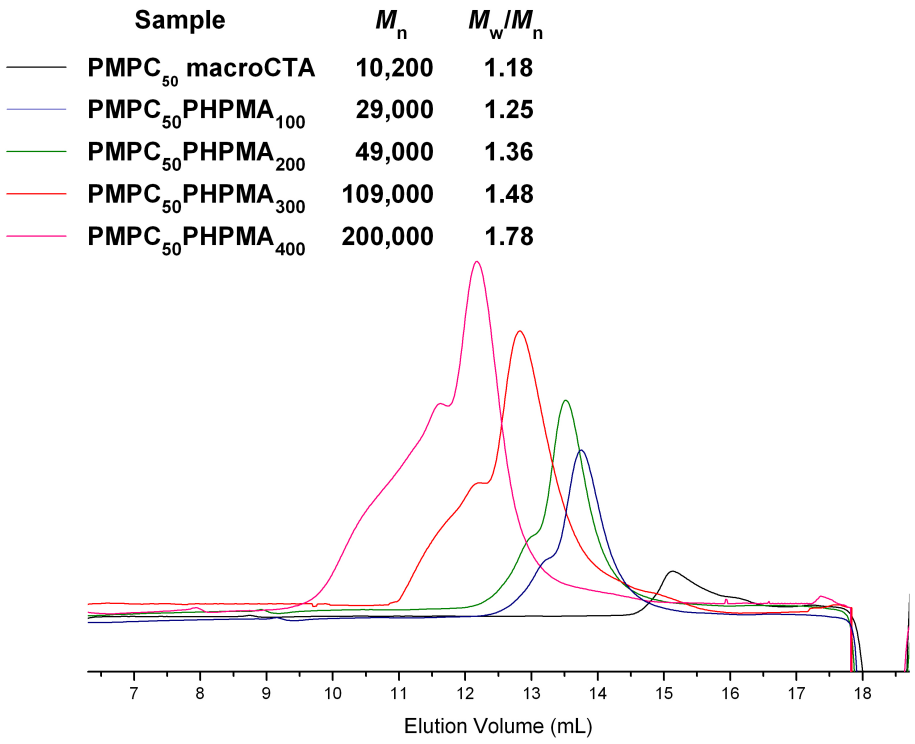

Fig. S4 Typical GPC curves obtained for the RAFT aqueous dispersion polymerization of HPMA at 70 °C using the $PMPC_{50}$ macro-CTA targeting mean degrees of polymerization for the PHPMA block of 100 to 400. There is a prominent high molecular weight shoulder, particularly when targeting higher DP PHPMA chains. This is due to a small amount (< 0.20 mol %) dimethacrylate impurity that is known to be present in HPMA monomer due to its propensity to undergo slow transesterification on storage at ambient temperature.[3] However, this impurity only causes relatively light branching rather than cross-linking, since DLS studies confirm complete dissolution of these linear $PMPC_{50}$-$PHPMA_m$ nanolatex particles in methanol, which is a good solvent for both the PMPC and PHPMA blocks.

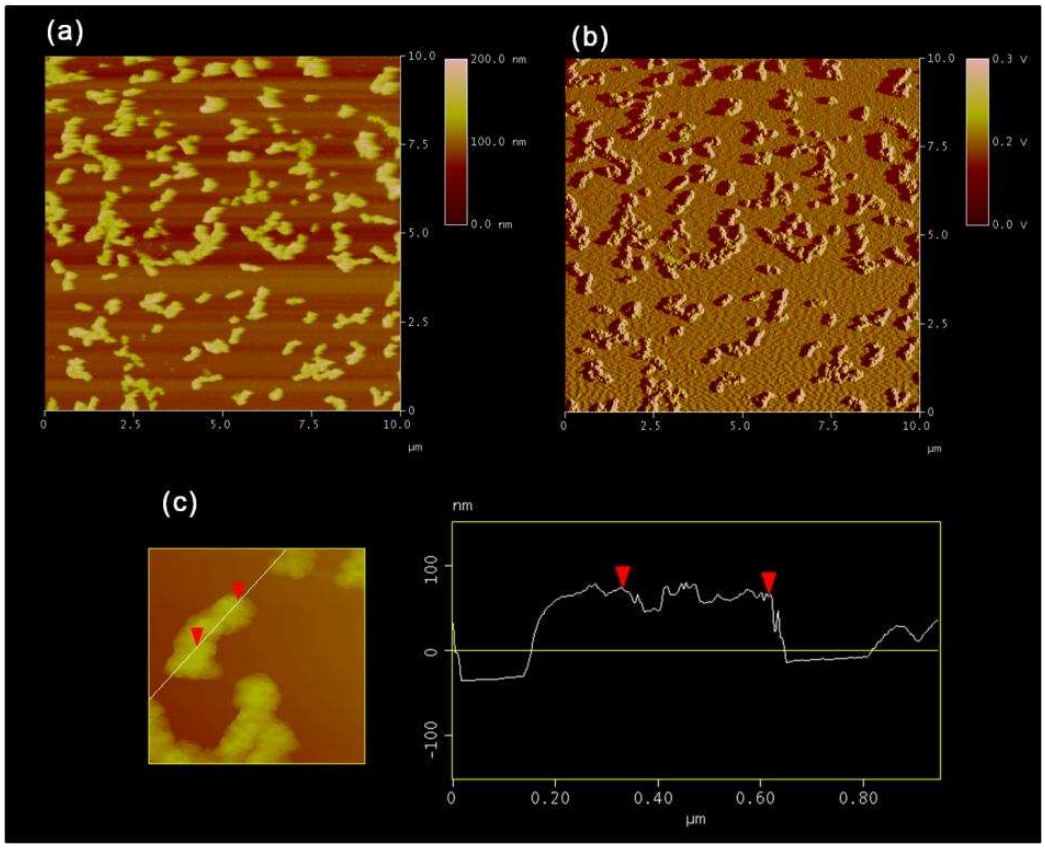

Fig. S5 Tapping-mode AFM image obtained for the $PMPC_{50}$-($PHPMA_{400}$-*stat*-$EGDMA_6$) 'lumpy rod' particles. (a) Height image (10.0 μm × 10.0 μm), (b) amplitude image, (c) cross-sectional image. The dilute aqueous dispersion was deposited onto freshly-cleaved mica and allowed to dry at 20 °C for 24 h prior to analysis.

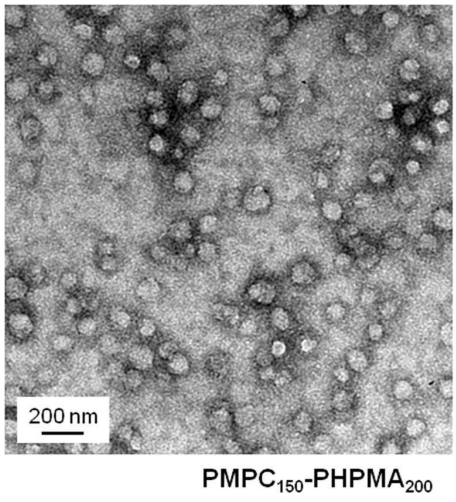

Fig. S6 TEM image of the linear $PMPC_{150}$-$PHPMA_{200}$ spherical nanolatex prepared by RAFT aqueous dispersion polymerization of HPMA at 70 °C using $PMPC_{50}$ macro-CTA at 10 w/w % solids.