Electronic Supplementary Information

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1. Characterisation of polymer chains

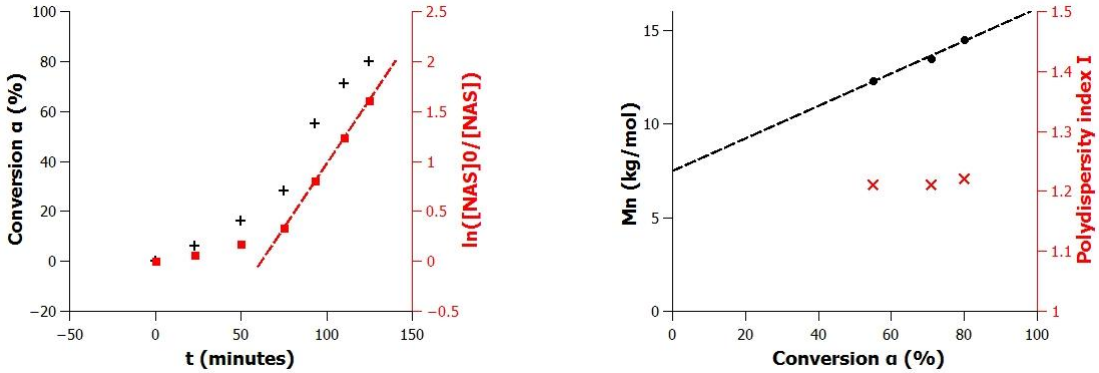


Figure S1. characteristic features of RAFT polymerization of NAS in DMF at 85 °C ($[NAS]_0$ = 3 mol/L; $[NAS]_0/[CTA]_0$ = 50 ; $[CTA]_0/[AIBN]_0$ = 10) : (a) kinetical monitoring by ^{1}H-NMR, (b) Mn and I versus conversion.

Polymerization was stopped by freezing the flask in liquid nitrogen after 2h reaction, i.e. at 80% conversion. The polymer was precipitated twice in dried diethylether. After drying under vacuum, the product was obtained as a yellow powder (1.54 g, 51 %). The dispersity of chain length was estimated by SEC. Mn was calculated from ^{1}H-NMR spectrum.

δ (RMN-^{1}H, DMSO) : 0.85 (t, J = 6.4 Hz, 3H), 1.24 (m, 20H), 1.71-2.40 (s, 100H), 2.74-2.87 (s, 186H), 2.98-3.25 (s, 55H), 10.55 (s, 1H) ; M_n (NMR)= 8.8 kg.mol^{-1} , Ip (SEC)= 1.2

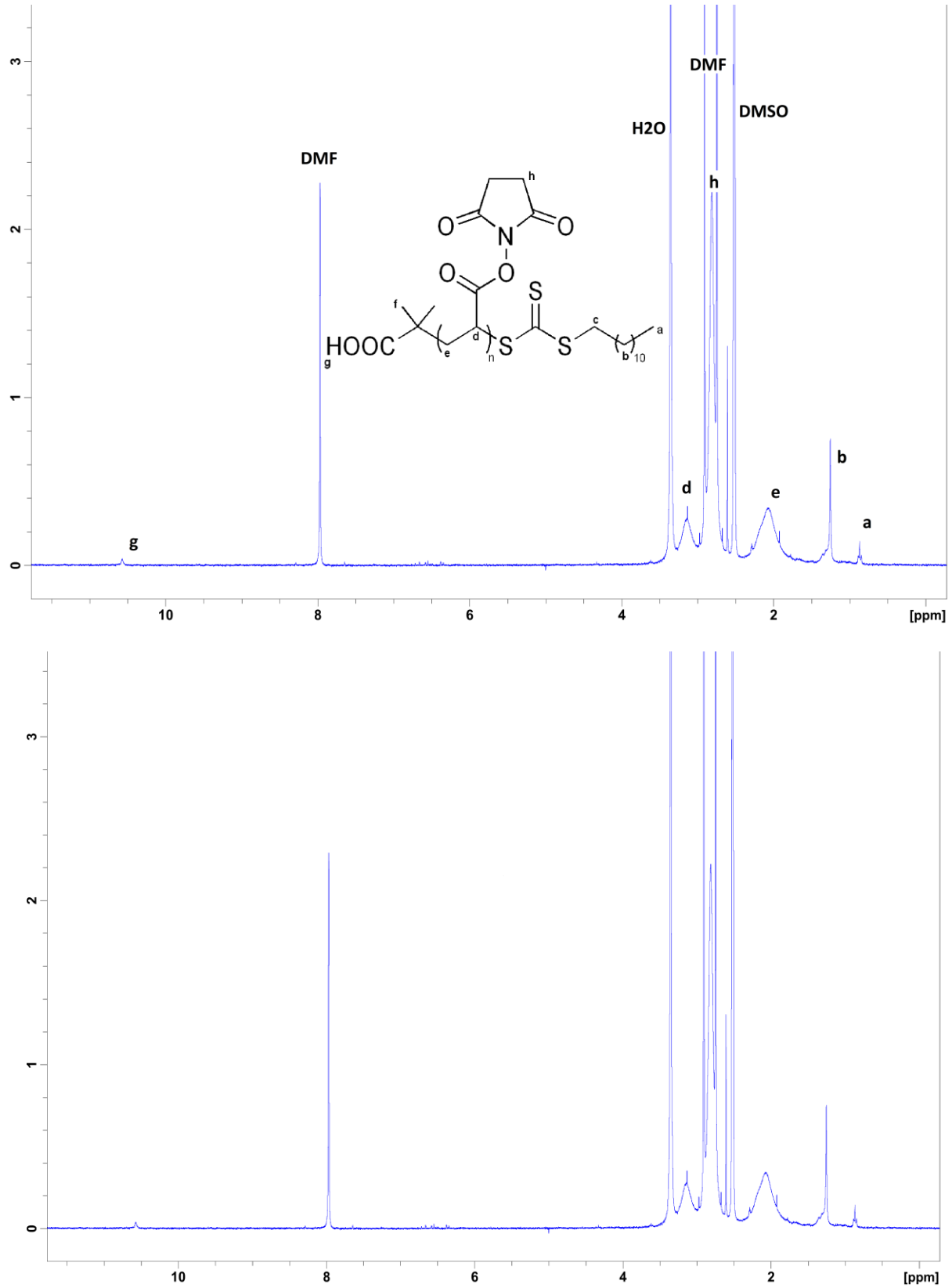


Figure S2. ^{1}H-NMR spectrum of the polyNAS in DMSO after two precipitations in dried diethylether.

Time of reaction	Conversion $\alpha^{(a)}$	DP_n			M_n (kDa)			$I^{(d)}$
		Theoretical[(b)]	NMR[(a)]	SEC[(c)]	Theoretical[(c)]	NMR[(c)]	SEC[(d)]	
2 H 05	80 %	40	50	83	7.1	8.8	14.5	1.2

Table S1. Characteristic features of PNAS obtained by RAFT polymerization (2h in DMF at 85 °C; $[NAS]_0$ = 3 mol/L; $[NAS]_0/[CTA]_0$ = 50 ; $[CTA]_0/[AIBN]_0$ = 10) and purified by two precipitations in dried diethylether. (a) Evaluated by ^{1}H-NMR in DMSO-d6, (b) calculated from $DP_{n\ theoretical} = \alpha \times \frac{[NAS]o}{[CTA]o}$, (c) calculated from $M_n = DP_n \times M_{NAS} + M_{CTA}$, (d) evaluated by simple-detection SEC in DMF (polystyrene standards)

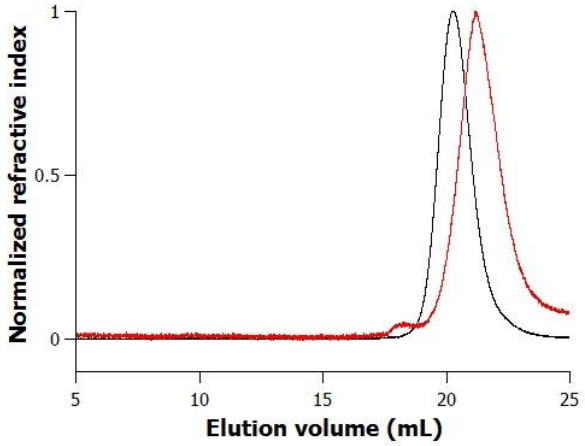
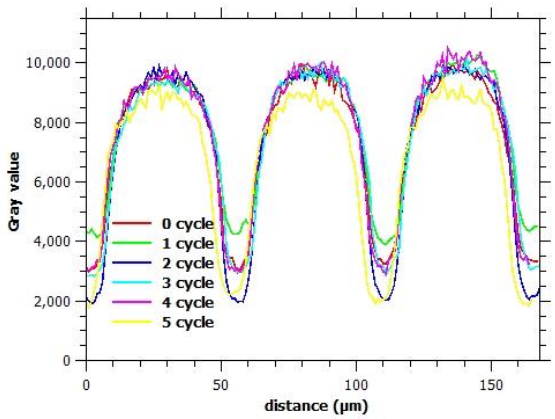


Figure S3. SEC Chromatograms of purified PNAS in DMF (black), and the macrograft derivative under the form of thiol-terminated PNIPAM (red). Elution volumes > 25 mL correspond to the elution of small molecules (Mn < 1000 g/mol); polymer chains were eluted as a single peak in the window 18mL - 24mL.

2. Surface coating

A



B

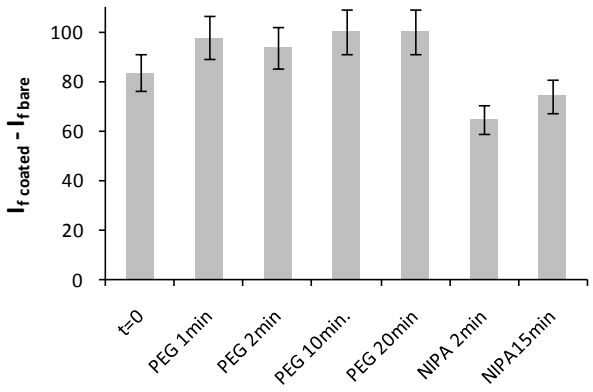


Figure S4. Fluorescence of AlexaPLL-g-PNIPAM-coated, and UV-etched, coverslips (alternative thin bare glass stripes and larger AlexaPLL-g-PNIPAM-coated ones) as evaluated by epifluorescence microscopy along a line orthogonal to the stripes. (A) coverslip subjected to 0 to 5 successive cycles of temperature sweep (in one cycle, the coverslip was immersed in water at 45 °C for 2-3 min., then in water at 25 °C); (B) after application of a solution of PLL-g-PEG (1 g/L) for increasing incubation times ($I_{f\ coated}$ - $I_{f\ bare}$ is the difference between fluorescence intensities of the large stripes and thin ones, normalized by the maximum value measured in the data set). Upon exposure to PLL-g-PEG, the bare stripes were coated with PLL-g-PEG. They were rinsed with water, and eventually incubated in an aqueous solution of 1g/L AlexaPLL-g-PNIPAM for 2 minutes (NIPA 2min) and 15 minutes (NIPA 15 min).

3. Blank experiments showing the (weak) non-specific adsorption of beads.

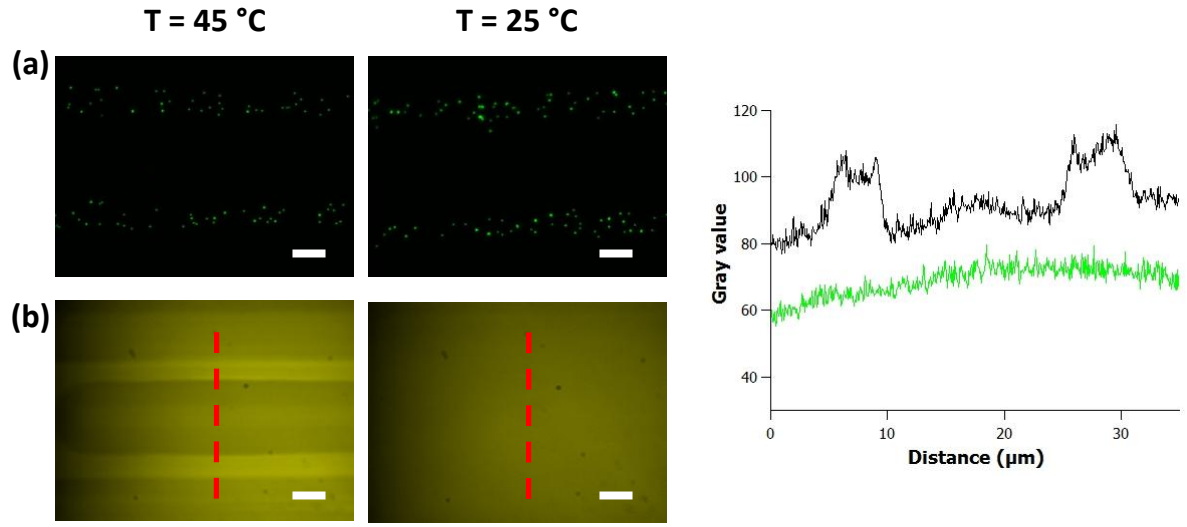


Figure S5. Epifluorescence pictures obtained from $S_{NIPAM:PEG}$ coverslip (alternative stripes of 100% PLL-g-PEG without biotin, and 100% PLL-g-PNIPAM) incubated with a solution of (a) fluoSphere and (b) Qdot-avidin at 45 °C or 25 °C (scale bar = 6 µm), (c) profile of the fluorescent intensity along the red line in (b) chosen to display a profile having the highest contrast within the images collected in these conditions; green = 25°C, black=45°C.

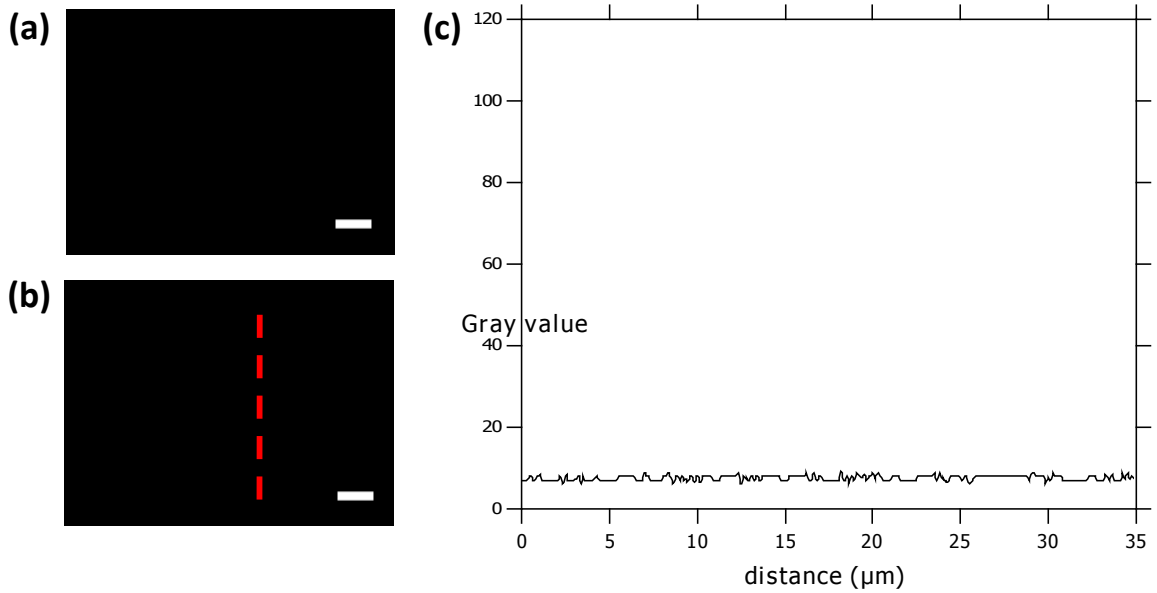


Figure S6. Epifluorescence pictures obtained on bare glass coverslip after incubation (a) with fluoSphere, and (b) with Qdot-avidin and water rinse ; (c) profile of the fluorescent intensity along the red line in (b) (scale bar = 6 µm)

Table S2. Fluorescence intensity (a.u.) measured on the PEGylated stripes after adsorption of QDs (same conditions as Table 3 in main text).

T (°C)	$S_{PEG/NIPAbiot}$	$S_{PEG/NIPAbiot:PEG\ 3:1}$	$S_{PEG/NIPA}$
25	50	77	60
45	70	90	85

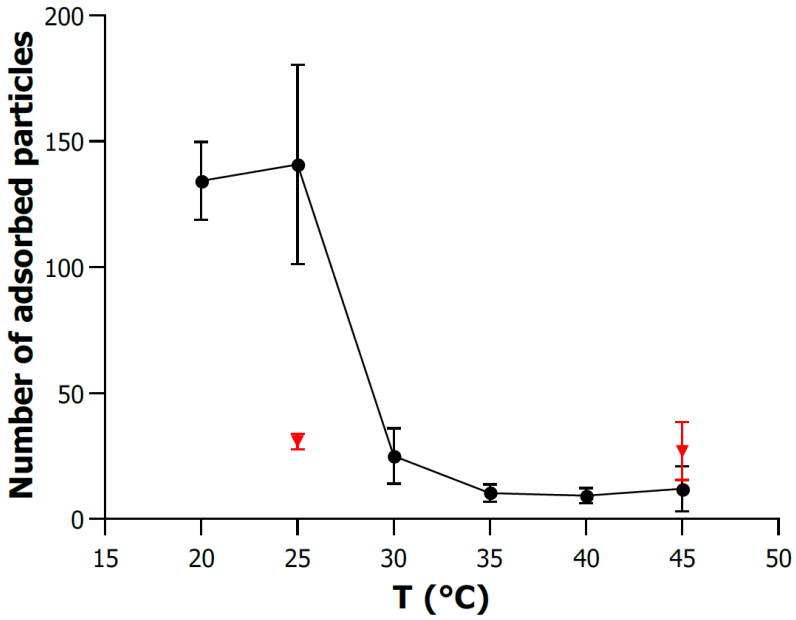


Figure S7. Number of FluoSpheres counted on a stripe coated with 100% PLL-g-NIPAMco-biotin (circles, $S_{PEG/NIPAbiot}$, total surface of 351 μm^2) incubated with Neutravidin-coated FluoSpheres at increasing temperature. Red triangles are controls on PLL-g-PNIPAM stripe (in $S_{PEG/NIPA}$ sample).

4. AFM

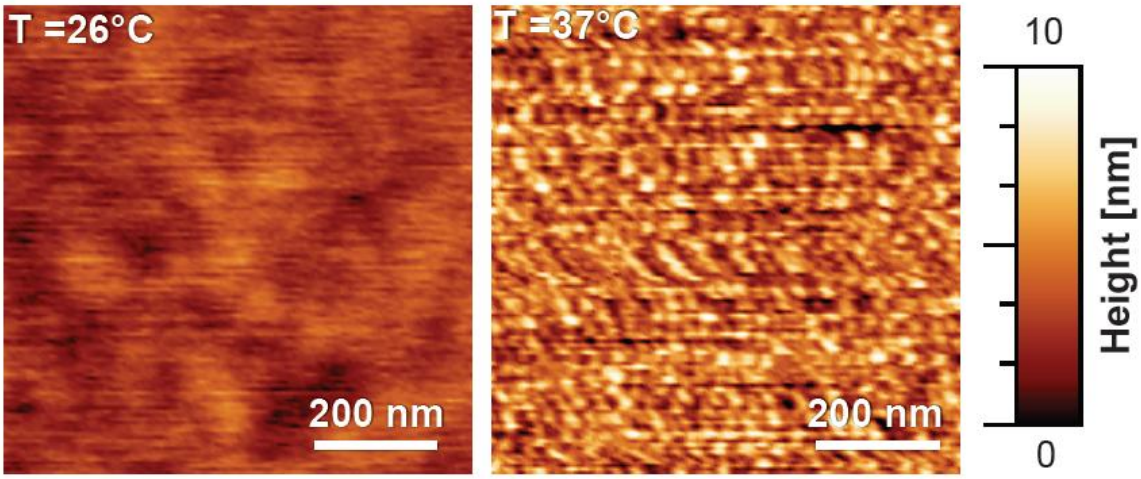


Figure S8. PF-QNM AFM topographs (full color scale : 10nm) in PBS Buffer.

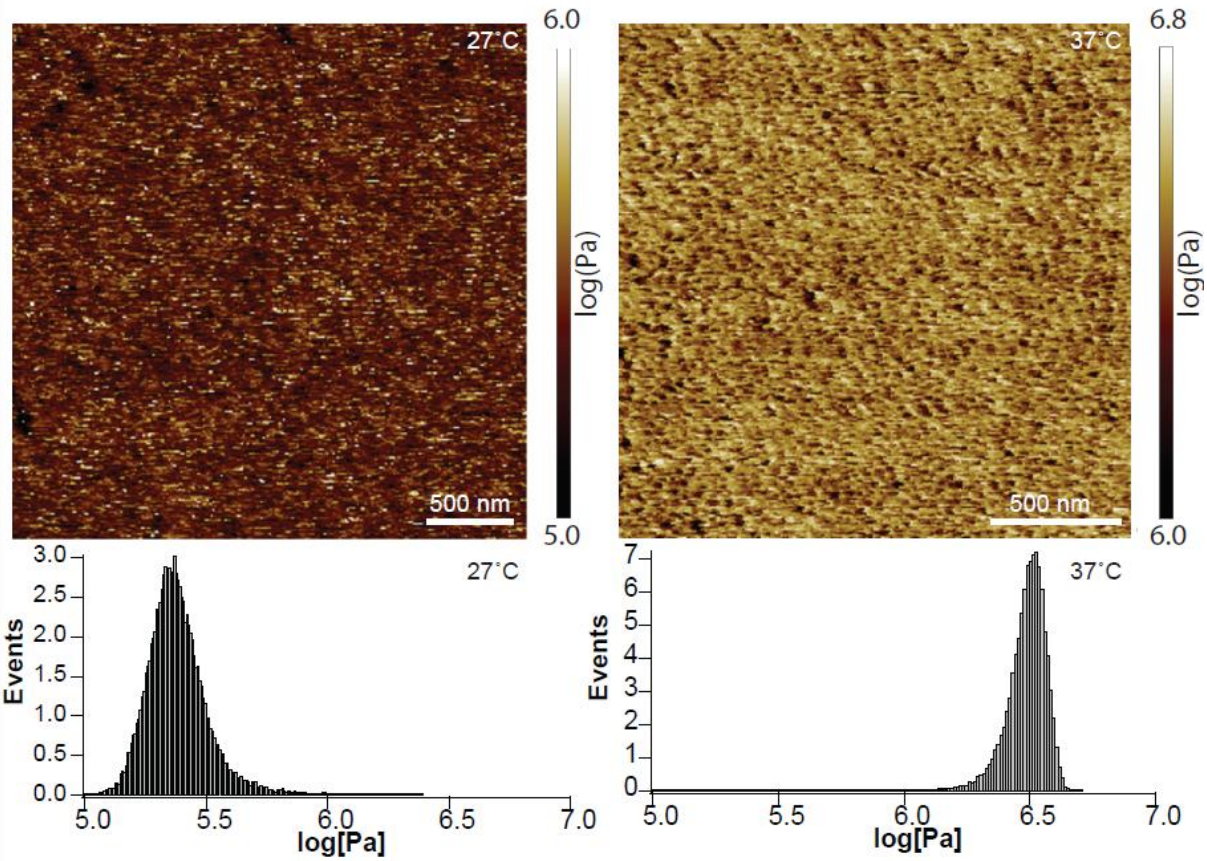


Figure S9. PeakForce nanomechanical maps obtained on the PNIPAM layers below and above phase transition

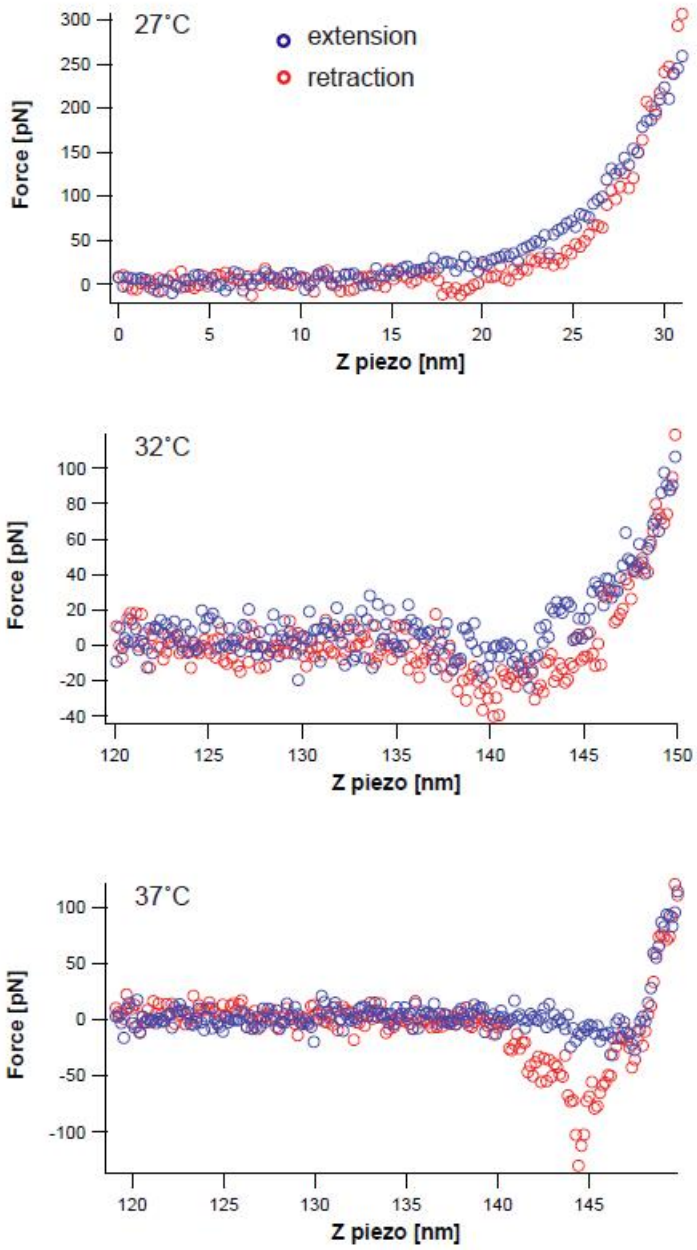


Figure S10. Extension and retraction force *vs* indentation above PLL-g-PNIPAM layer initially equilibrated in PBS at 27°C (top), then heated up to the temperature quoted in figures.

References.

1. D. B. Thomas, A. J. Convertine, L. J. Myrick, C. W. Scales, A. E. Smith, A. B. Lowe, Y. A. Vasilieva, N. Ayres and C. L. McCormick, *Macromolecules*, 2004, **37**, 8941-8950.
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3. E. K. Dimitriadis, F. Horkay, J. Maresca, B. Kachar and R. S. Chadwick, *Biophysical Journal*, 2002, **82**, 2798-2810.
4. L. Picas, F. Rico and S. Scheuring, *Biophysical Journal*, 2012, **102**, L1-L3.