SUPPORTING INFORMATION:

Single Molecule Adhesion of a Stimuli-Responsive Oligo(Ethylene Glycol) Copolymer to Gold

Michael A. Nash[1,] and Hermann E. Gaub[1]*

[1]Lehrstuhl für Angewandte Physik and Center for NanoScience, Ludwig-Maximilians-Universität, D-80799 Munich, Germany

*Corresponding author

Michael A. Nash, Ph. D.

Lehrstuhl für Angewandte Physik and Center for Nanoscience (CeNS)

Ludwig-Maximilians-Universität

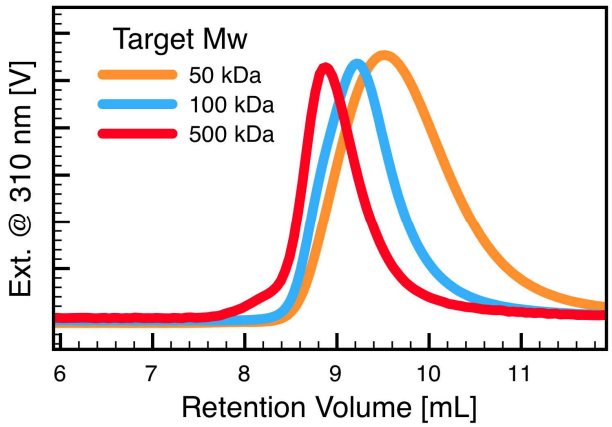
Amalienstrasse 54, 80799 Munich

Tel: +49 89 2180 3162

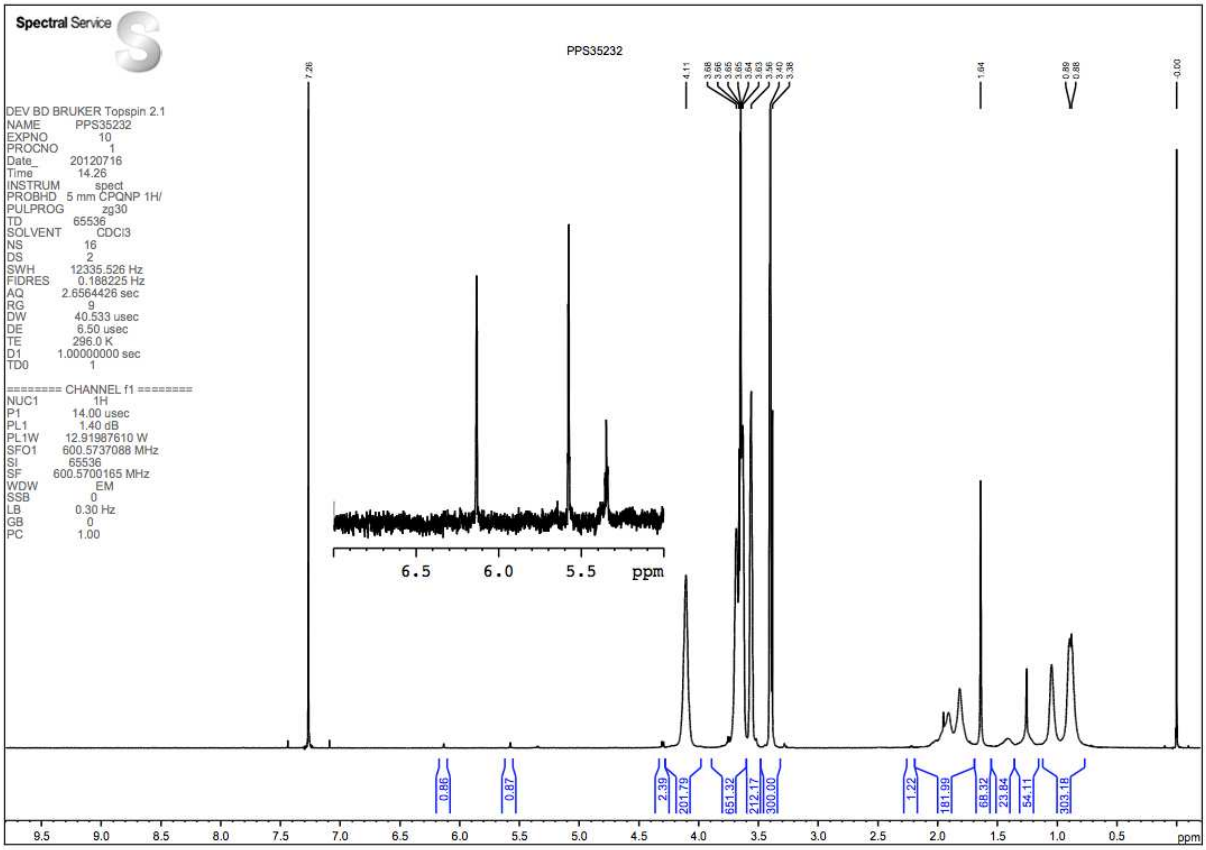
Fax: +49 89 2180 2050

Email: michael.nash@physik.uni-muenchen.de

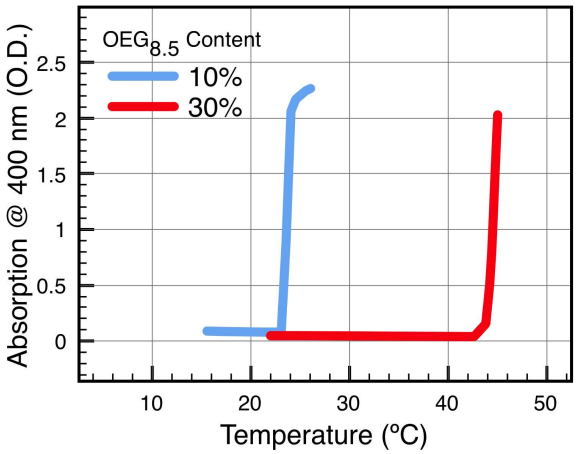
SUPPORTING FIGURES:



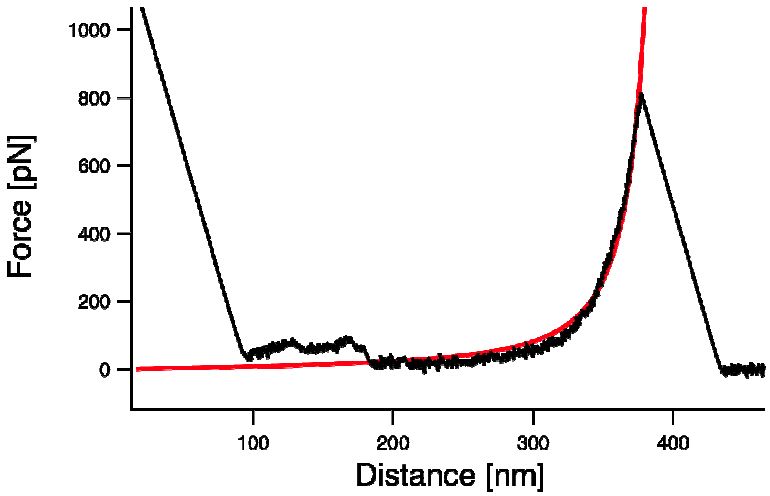
Supporting Figure 1. Size exclusion chromatography traces of OEG-MA statistical copolymers containing 20% OEG_8-MA, 80% OEG_2-MA by weight. Larger molecular weights were targeted by lowering the amount of chain transfer agent in the polymerization feed. The final molecular weights obtained by this polymerization were smaller than the targeted values because of incomplete monomer conversion and termination. For AFM studies, the largest polymer was used (500 kDa targeted, 220 kDa actual, PDI 1.4).



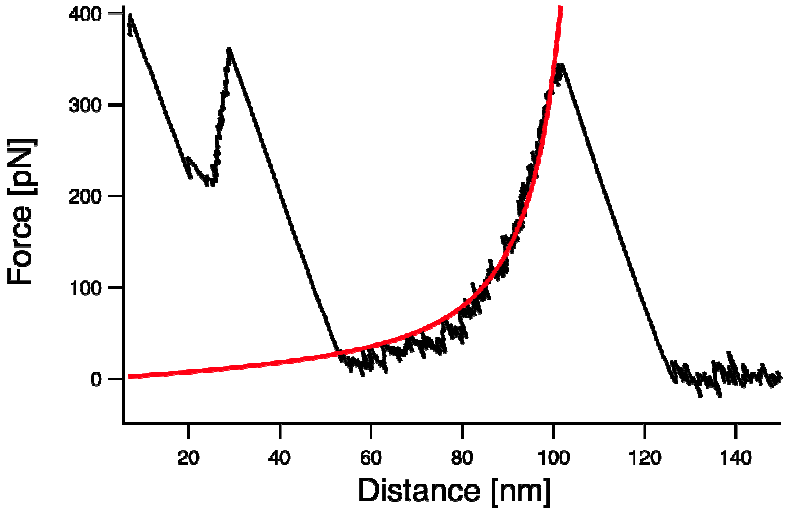
Supporting Figure 2. ^{1}H-NMR spectrum of the 220 kDa OEG-MA statistical copolymer (8mg/mL, $CDCl_3$, 600 MHz.)



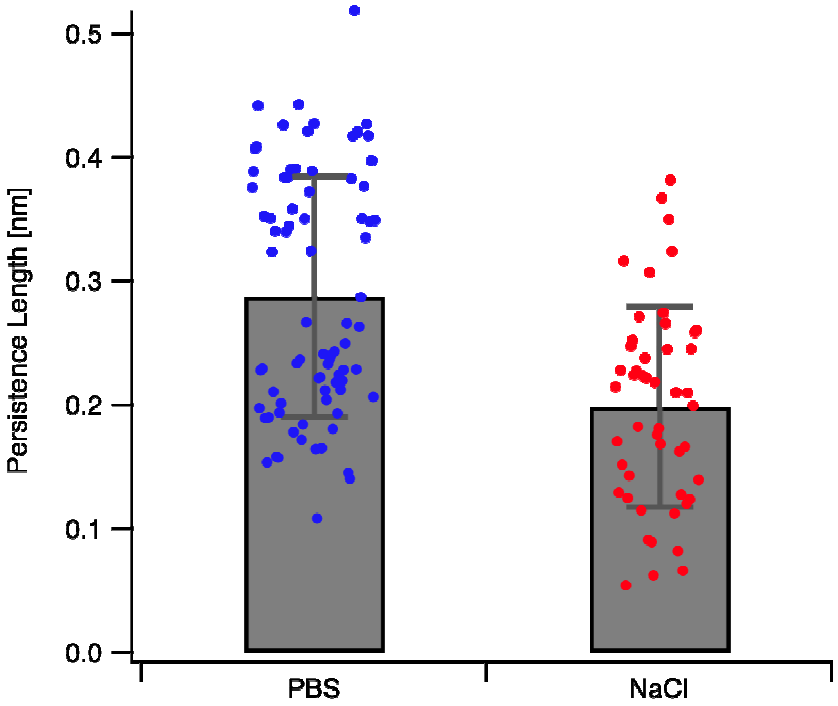
Supporting Figure 3. Cloud-point curves in PBS (0.14 M NaCl, pH 7.4) for OEG-MA statistical copolymers containing the indicated amount of OEG_8-MA in the polymerization feed.



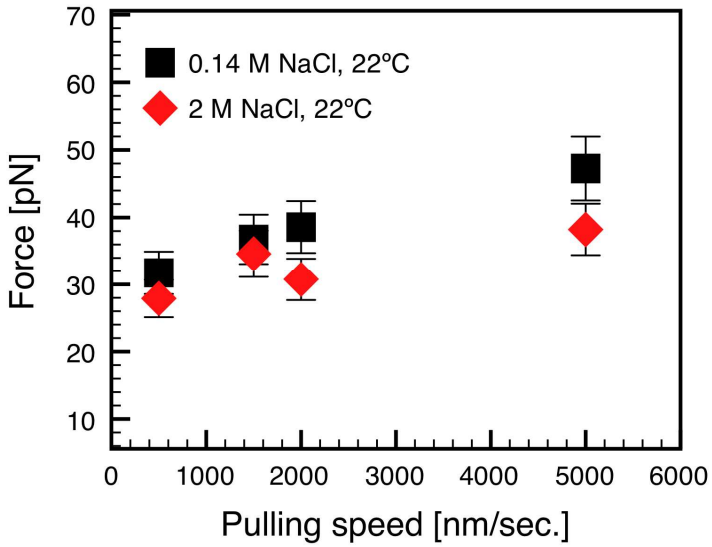
Supporting Figure 4. Example of a comparatively rare case of WLC behavior of the polymer in 0.14 M NaCl/PBS. Force data are shown in black, with a WLC model (persistence length= 0.25 nm, contour length= 408 nm) shown in red. In the 0.14 M NaCl/PBS buffer, the fraction of WLC traces across two independent experiments was found to be 0.016 ±0.002, or approximately 1.6%.



Supporting Figure 5. Example of a comparatively rare case of WLC behavior of the polymer in 1 M NaCl/PBS. Force data are shown in black with a WLC model (persistence length=0.152 nm, contour length = 117 nm) shown in red. In the 1 M NaCl/PBS buffer, the fraction of WLC traces across two independent experiments was found to be 0.026 ±0.12, or approximately 2.6%.



Supporting Figure 6. Comparison of the persistence length in each solvent determined from non-linear fitting of the rare traces that exhibited WLC behavior. Dots represent persistence length fits of individual force extension curves. The gray bars are the sample mean ± standard deviation.



Supporting Figure 7. Dependence of desorption force on pulling speed. Histograms such as those shown in Figure 5 of the main text were obtained at different cantilever retraction velocities for the same cantilever in 0.14M NaCl (black) and 2M NaCl (red). Plotted is the mean ± 10% for the Gaussian fit to the histogram peak corresponding to 1 polymer molecule adsorbed to the surface (see Figure 5).