

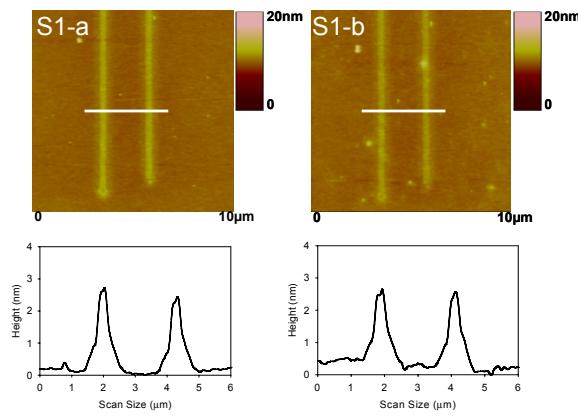
Supplementary Information

Experimental details

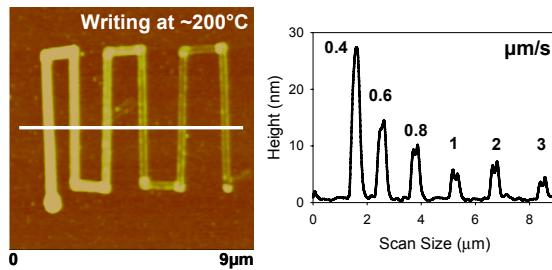
A silicon substrate was cleaned with hot piranha solution for 30 min and extensively rinsed with DI water. The substrate was then placed in an epoxysilane ((3-glycidoxypropyl)trimethoxysilane) (Sigma-Aldrich, USA) solution (1 vol % in toluene) overnight. The SAM thickness was measured with a spectroscopic ellipsometer (J.A. Woollam Co., Inc., USA). Carboxylic acid-functionalized PNIPAAm (MW about 23,000; Polymer source, Inc., Canada) was patterned onto the epoxy-terminated SAM surface by heating the thermal cantilever probe tip to 200 °C. The patterned sample was then annealed in a vacuum oven at 150 °C for 3-6 hours to react the surface epoxy with the polymer carboxylic acid groups. Next, a thin film of poly(ethylene glycol) diacid (MW=600; Sigma-Aldrich, USA) was deposited by chemical vapor deposition at 150 °C for 3 hours in vacuum. The PEG film thickness was measured with a spectroscopic ellipsometer on an unpatterned region of the sample. Finally, the sample was sonicated in EtOH and DI water for 10 min each, and then dried in a stream of dry N₂.

Adhesion forces between patterned PNIPAAm and a silicon nitride AFM cantilever ($k \sim 0.05$ N/m) were measured via AFM (Veeco Digital Instrument, USA) in water. The temperature of the water was controlled by an AFM heating stage (Veeco Digital Instrument, USA) beneath the sample substrate. To equilibrate the temperature, we waited at least 15 min following any temperature changes before measurement.

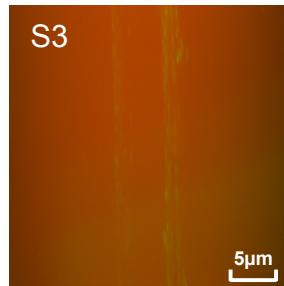
Supplementary Material (ESI) for Soft Matter
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S1. Tapping mode AFM topographic images of PNIPAAm patterns in DI water (a) at 23 °C (below the LCST); (b) 40 °C (above the LCST). Note there was no significant change in pattern height.



S2. PNIPAAm line features patterned by different writing speed at ~200 °C. Feature height varied from 3.5 nm to 26 nm.



S3. Optical microscopy fluorescence image of FTIC-labeled neutravidin bound to micrometer-scale PNIPAAm patterns.