

Supporting Information

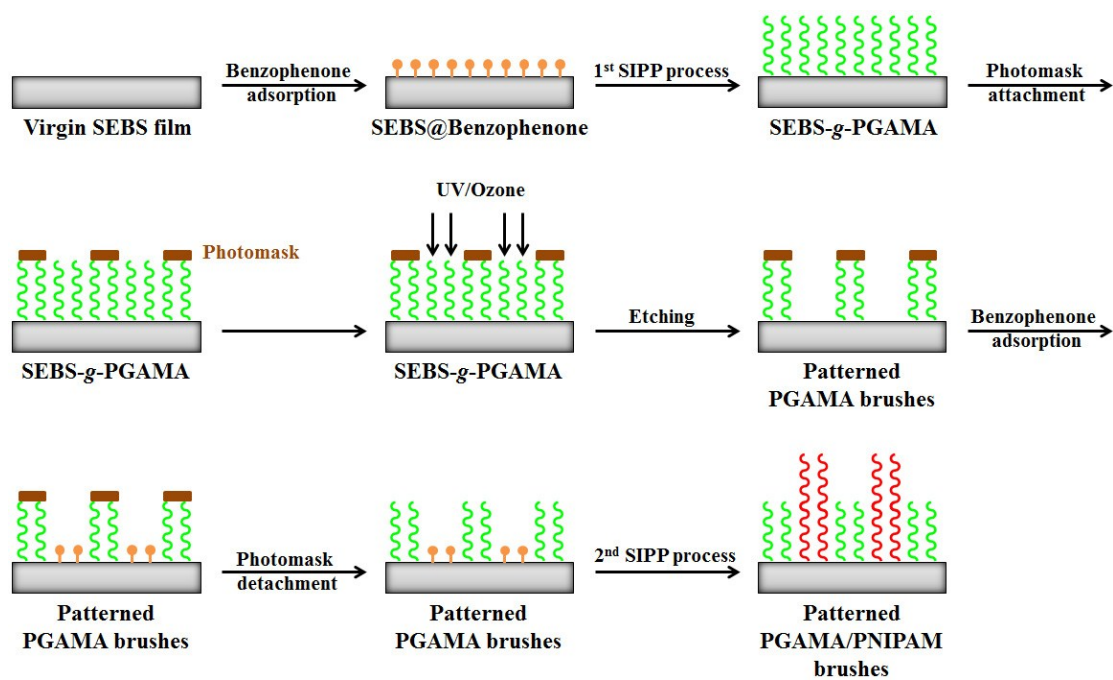
Multiple microarrays of non-adherent cells on a single 3D stimuli-responsive binary polymer-brush pattern

Jianwen Hou,^a Runhai Chen,^a Jingchuan Liu,^a Haozheng Wang,^a Qiang Shi,^{* a}
Zhirong Xin,^b Shing-Chung Wong,^c and Jinghua Yin^a

^a State Key Laboratory of Polymer Physics and Chemistry, Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, Changchun 130022, P. R. China.

^b Department of Polymer, School of Chemistry and Chemical Engineering, Yantai University, Yantai, 264005, P. R. China

^c Department of Mechanical Engineering, University of Akron, Akron, Ohio 44325-3903, USA.



Scheme S1. Schematic diagram illustrating the formation process of binary polymer-brush patterns.

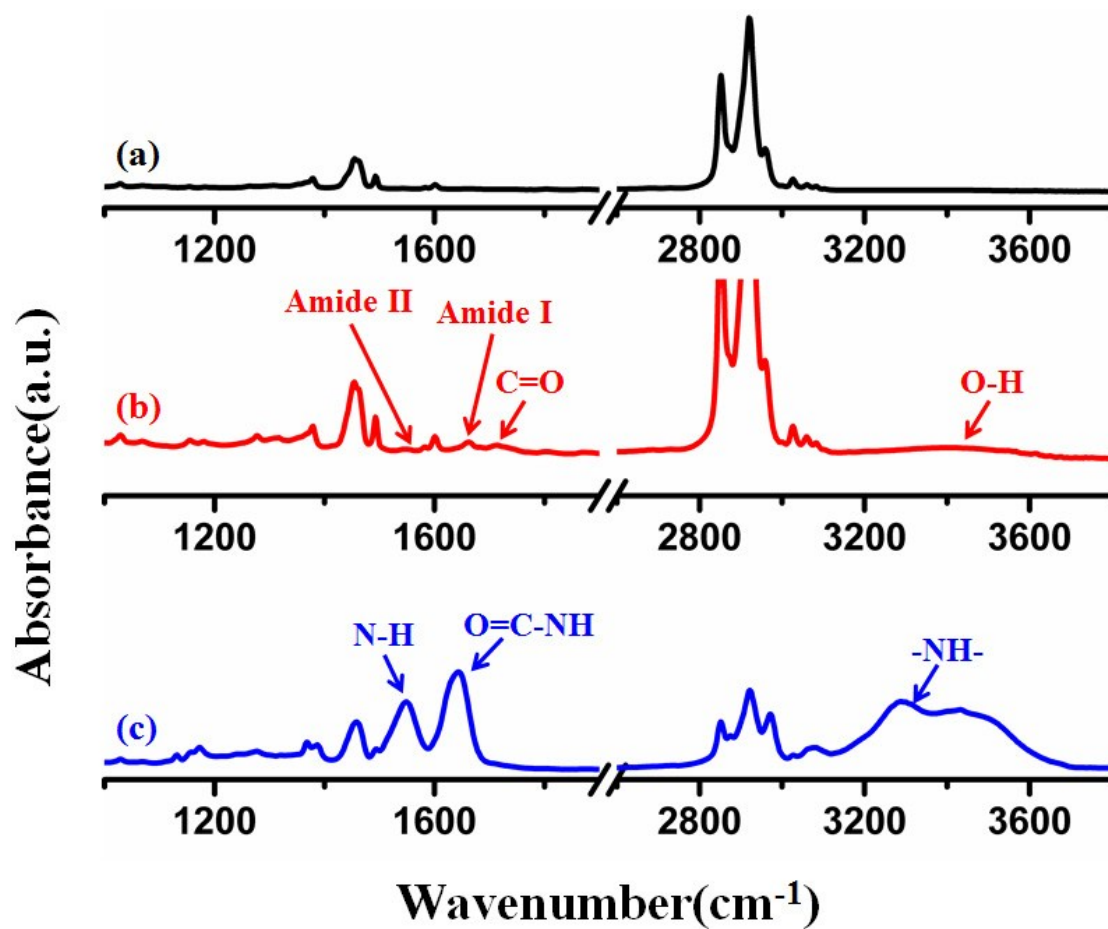


Figure S1. ATR-FTIR spectra of (a) SEBS, (b) SEBS-g-PGAMA, (c) SEBS-g-PNIPAM surfaces.

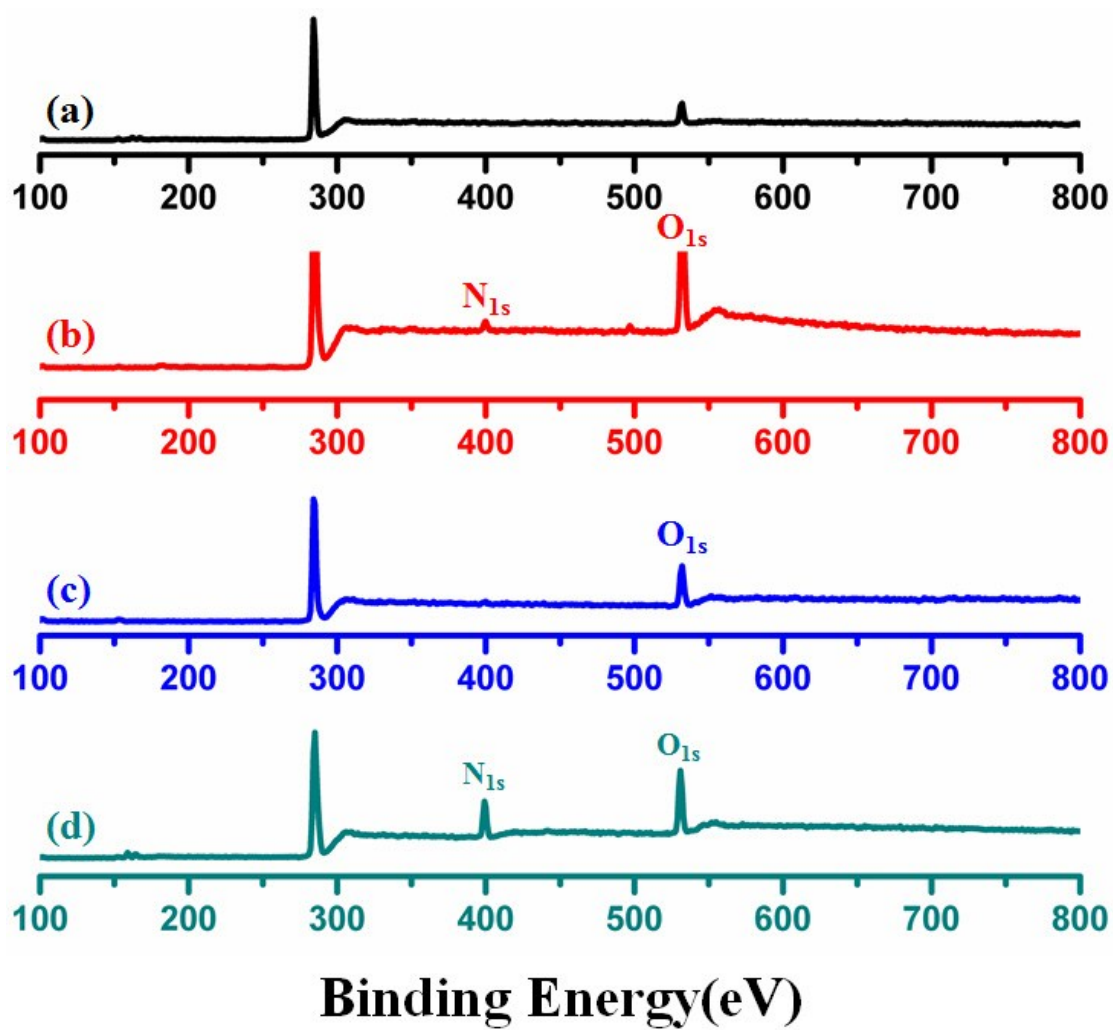


Figure S2. XPS survey scan of (a) SEBS, (b) SEBS-g-PGAMA, (c) UV/Ozone-treated SEBS-g-PGAMA, (d) SEBS-g-PNIPAM samples.

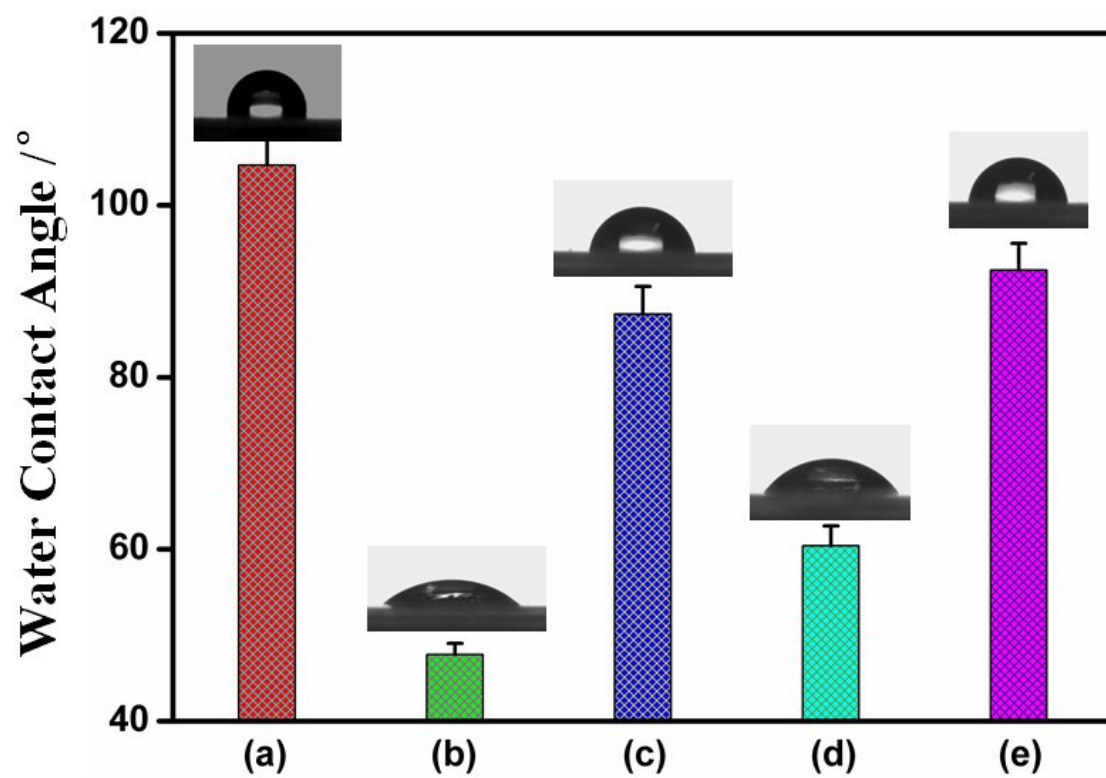


Figure S3. Water contact angle of different samples: (a) SEBS, (b) SEBS-g-PGAMA, (c) UV/Ozone-treated SEBS-g-PGAMA, (d) SEBS-g-PNIPAM (20 °C) and (e) SEBS-g-PNIPAM (37 °C).

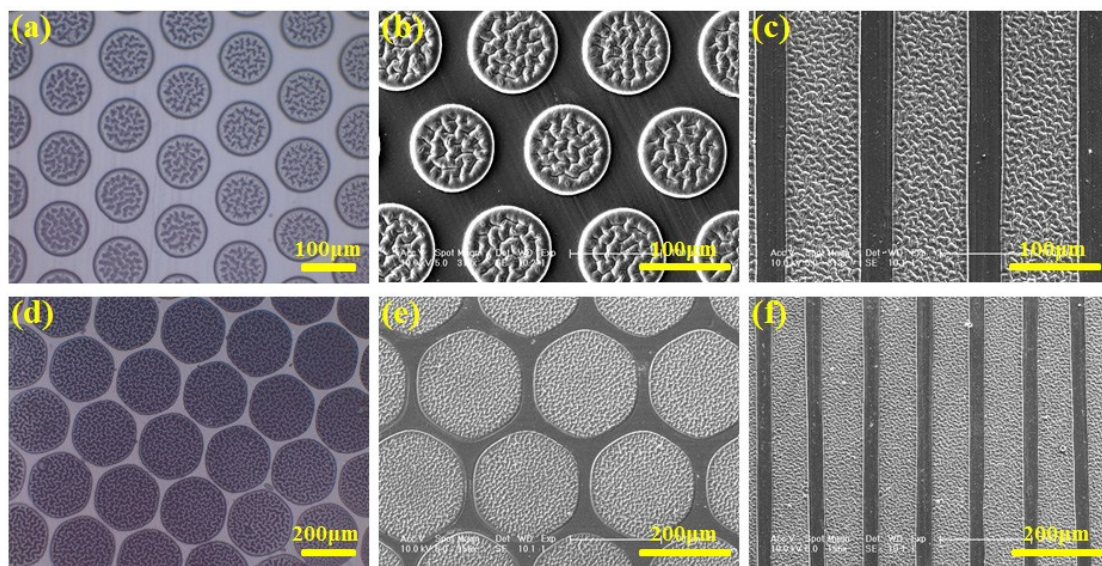


Figure S4. POM (left) and SEM (middle and right) images of PNIPAM/PGAMA patterns with different sizes and varied geometries.

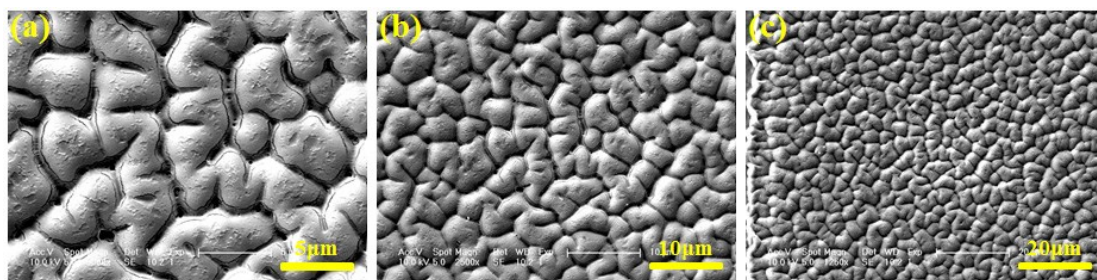


Figure S5. SEM images showing typical surface morphologies of PNIPAM brushes grafted from the substrate under different magnifications (a) 5000 \times , (b) 2500 \times , (c) 1250 \times .

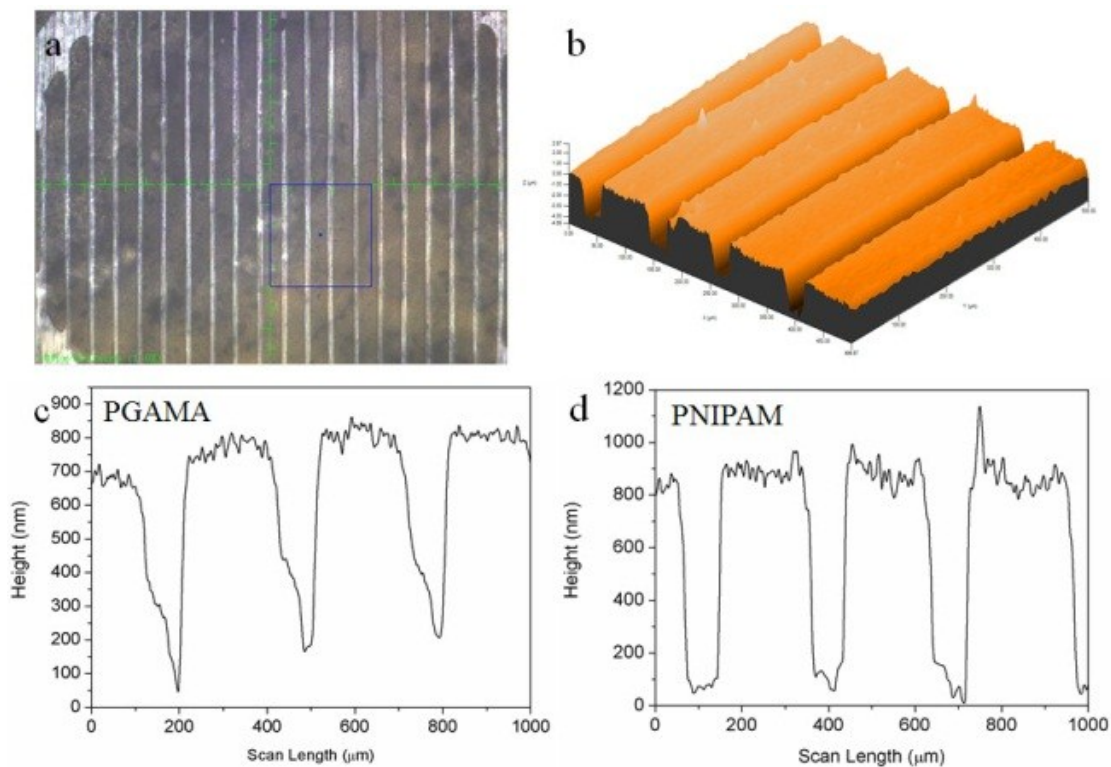


Figure S6. Thickness of polymer brushes at dry state after UV irradiation for 8 min. a) Image of sample taken by CCD camera; b) 3D profile of patterned surface; c) Height vs scan length curve of patterned SEBS-g-PGAMA; d) Height vs scan length curve of patterned SEBS-g-PNIPAM.

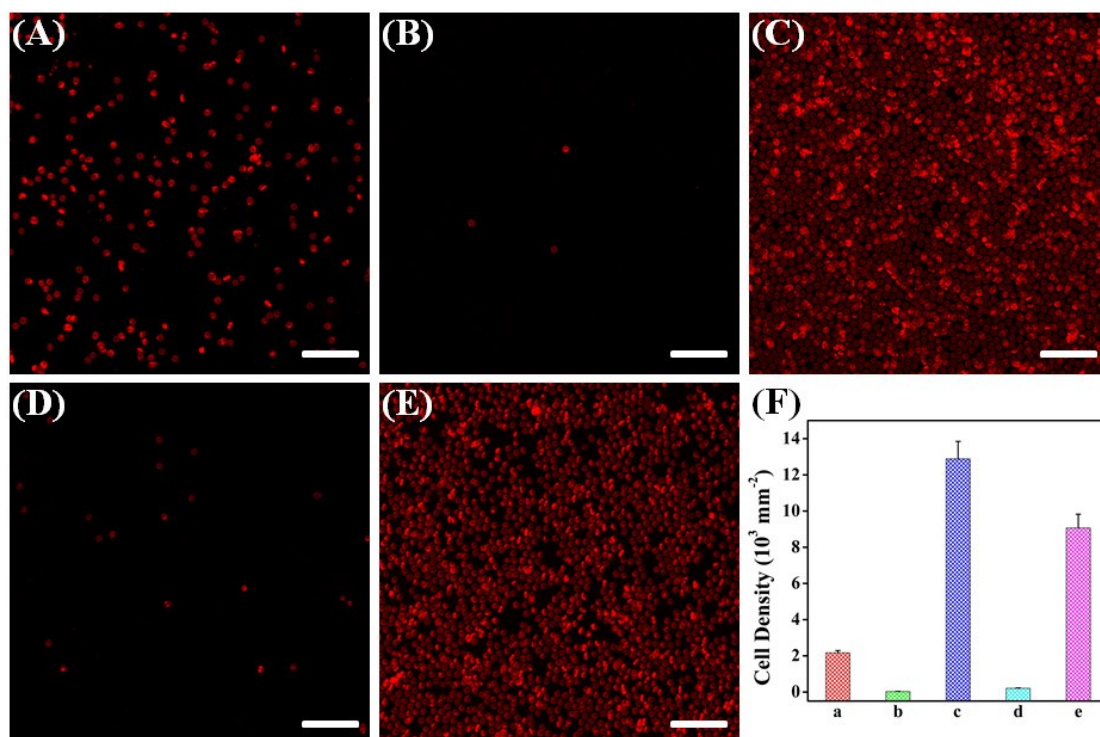


Figure S7. CLSM images showing RBCs adhesion on the surface of (A) virgin SEBS, (B) SEBS-g-PGAMA (without preadsorbed Con A), (C) SEBS-g-PGAMA (with preadsorbed Con A), (D) SEBS-g-PNIPAM (20 °C), and (E) SEBS-g-PNIPAM (37 °C), respectively. The scale bar is 50 μm in all images. (F) Statistical number of adhered normal RBCs on different samples: (a) SEBS, (b) SEBS-g-PGAMA, (c) SEBS-g-PGAMA (preadsorbed Con A), (d) SEBS-g-PNIPAM (20 °C), (e) SEBS-g-PNIPAM (37 °C).

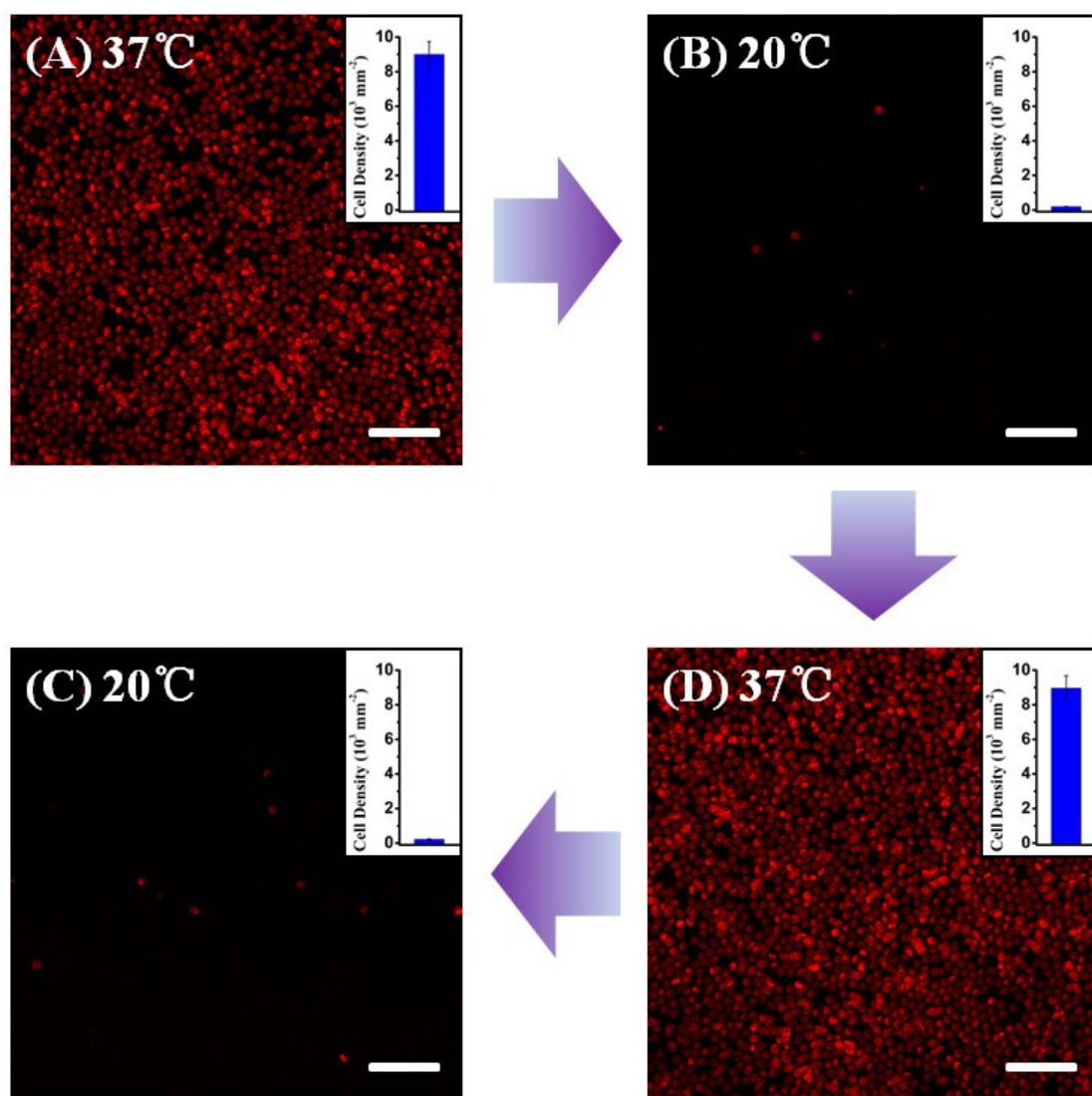


Figure S8. CLSM images showing reversible adhesion and detachment of red blood cells on as-prepared SEBS-g-PNIPAM surfaces triggered by temperature. The insets indicate the quantification of the targeted red blood cells on the surface. The error bar represents the standard error of mean from three repeats. The scale bar is $50 \mu\text{m}$ in all images.

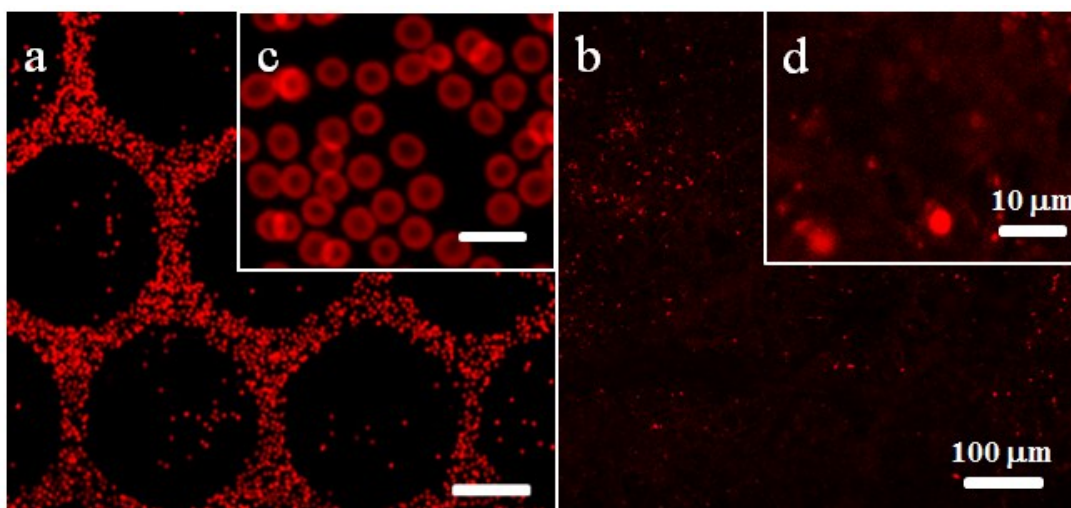


Figure S9. CLSM images of fresh RBCs and hemolytic RBCS adhesion on the patterned surface in the presence of Con A at 20 °C, respectively. (a) fresh RBCs, (b) hemolytic RBCs, (c) fresh RBCs adhered on the patterned surface, (d) hemolytic RBCs adhered on the patterned surface. The scale bar for a,b is 100 μm , c,d is 10 μm , respectively. Cell microarrays are formed on the patterned surface with fresh RBCs, but no cell microarrays are observed on the patterned surface with hemolytic RBCs, indicating the patterned surface can different normal cells from dysfunctional cells. Moreover, the captured fresh RBCs maintain regular biconcave shape (c), confirming binary polymer brushes almost have no damage to RBCs.

Table S1. The thickness of polymer brushes varied with polymerization time

Irradiation time (min)	Thickness (nm)	
	PGAMA	PNIPAM
4 min	406±32	458±25
8 min	610±20	790±35