In-Situ Roughening of Polymeric Microstructures

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Supporting Information

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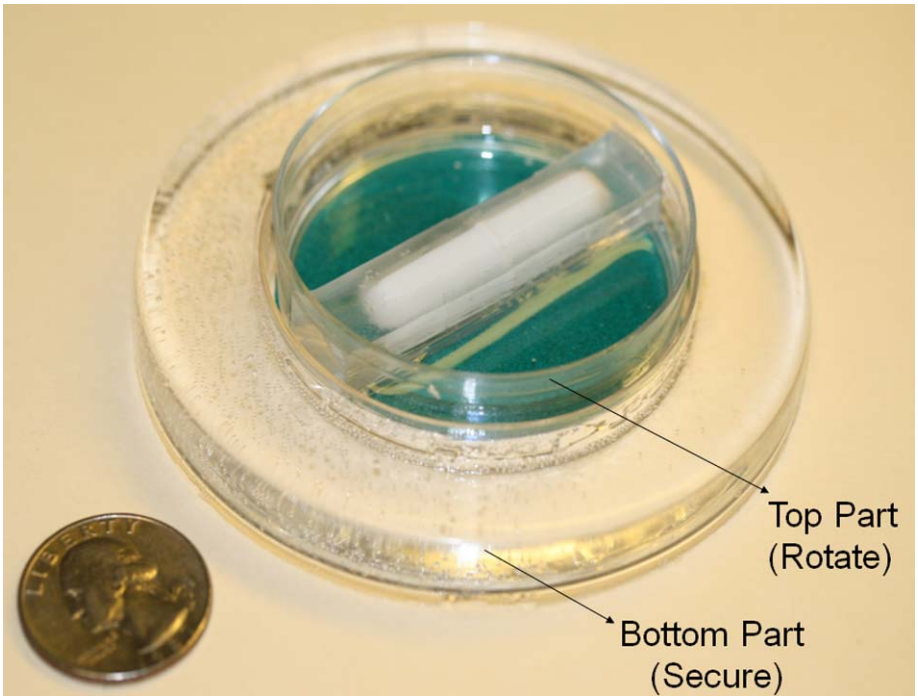

Figure S1. Photograph of the assembled device used for roughening of micropallet arrays, PDMS stamps, and photoresist films.

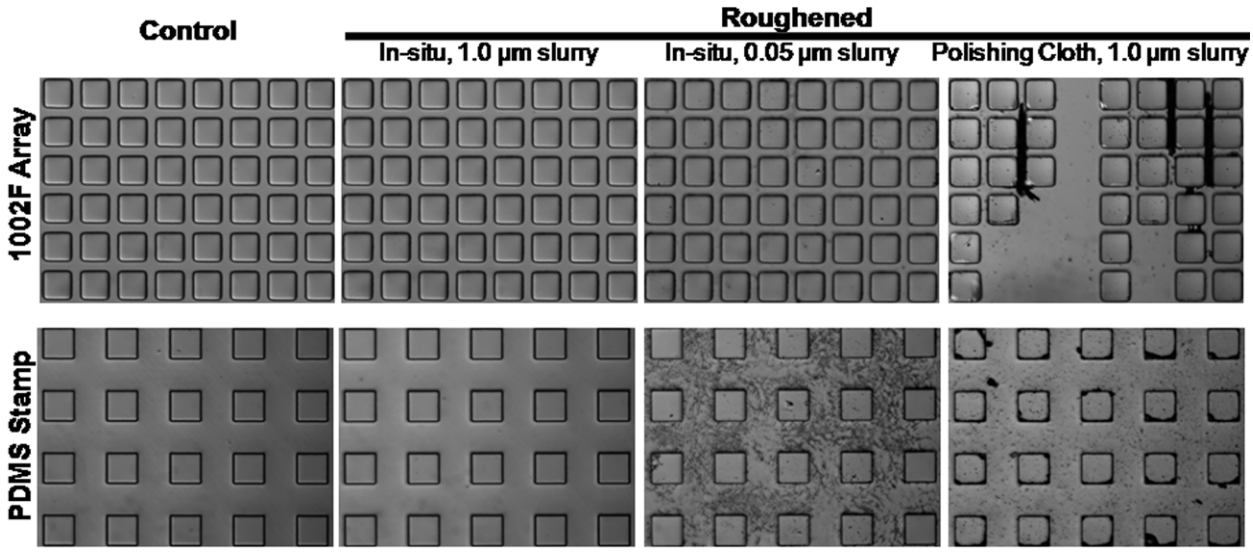

Figure S2. Arrays roughened with different media. DIC micrographs (40×) of 1002F pallet arrays (45 µm sides, 15 µm inter-pallet spacing, 50 µm height) and PDMS stamps (50 µm squares, 50 µm spacing, 50 µm height) roughened with 1.0-micron particles, 0.05-micron particles or 1.0-micron particles overlaid with a polishing cloth. Use of the 0.05-micron particle or polishing cloth either damaged the array or left visible residue on the arrays. The roughening procedure for experiments involved with a polishing cloth only (last column in this figure) was similar to in-situ roughening procedure except that a polishing cloth attached to a flat surface was used by hand to mechanically roughen the arrays and stamps with slurry. Similar to in-situ method, the roughened arrays and stamps were rinsed with distilled water and then ethanol five times and dried with N_2.

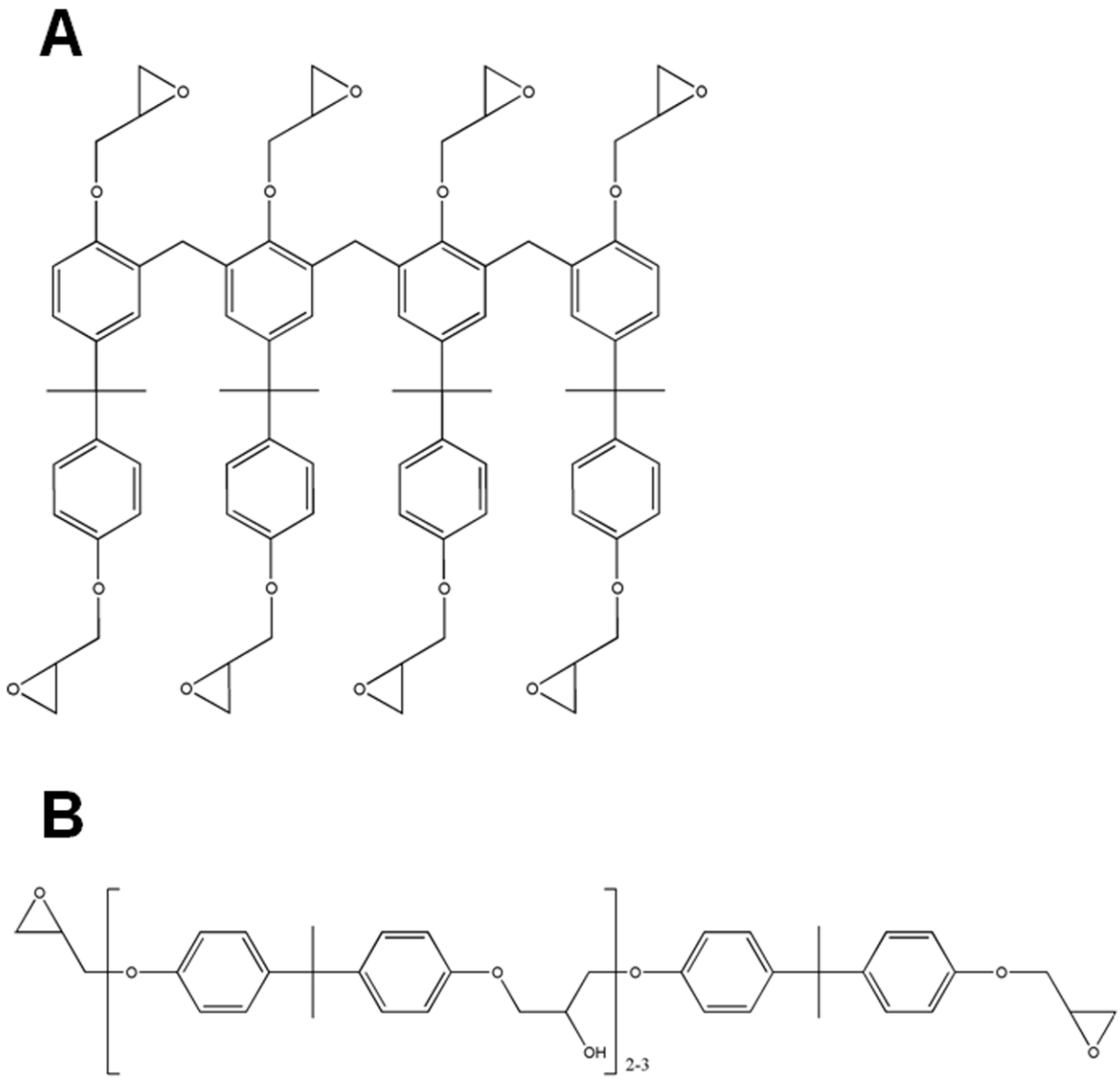

Figure S3. Chemical structure of (A) SU8 and (B) 1002F resins.

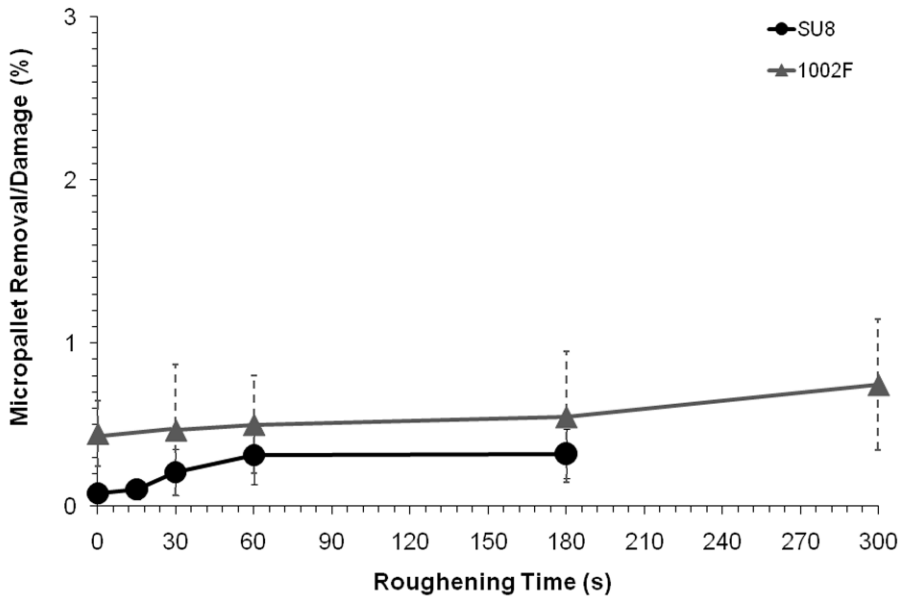

Figure S4. Micropallet removal or damage plotted against the roughening time for SU8 and 1002F micropallet arrays. The data points represent the average values (n >5,000 micropallets) and the error bars correspond to standard deviations.

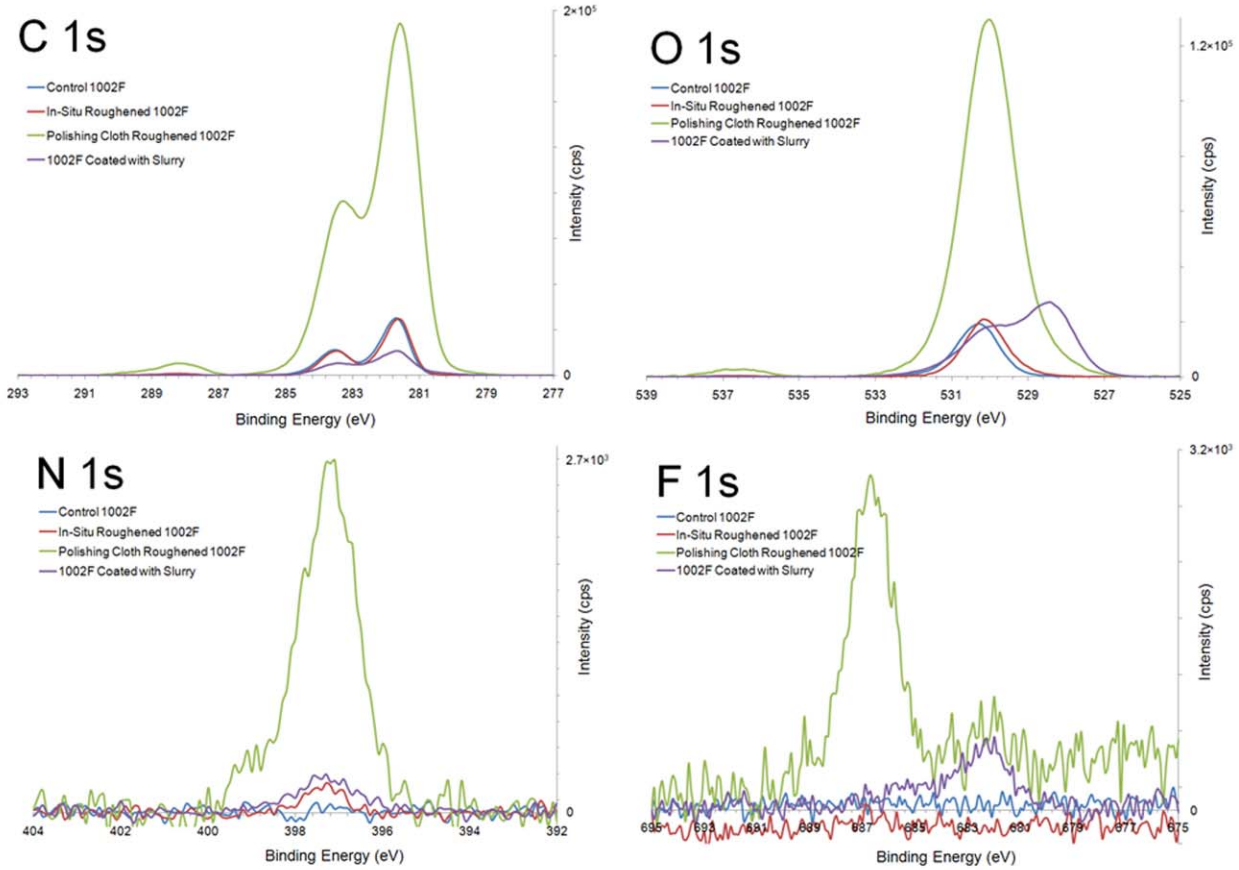

Figure S5. High resolution XPS scans for 1002F surfaces before and after roughening.

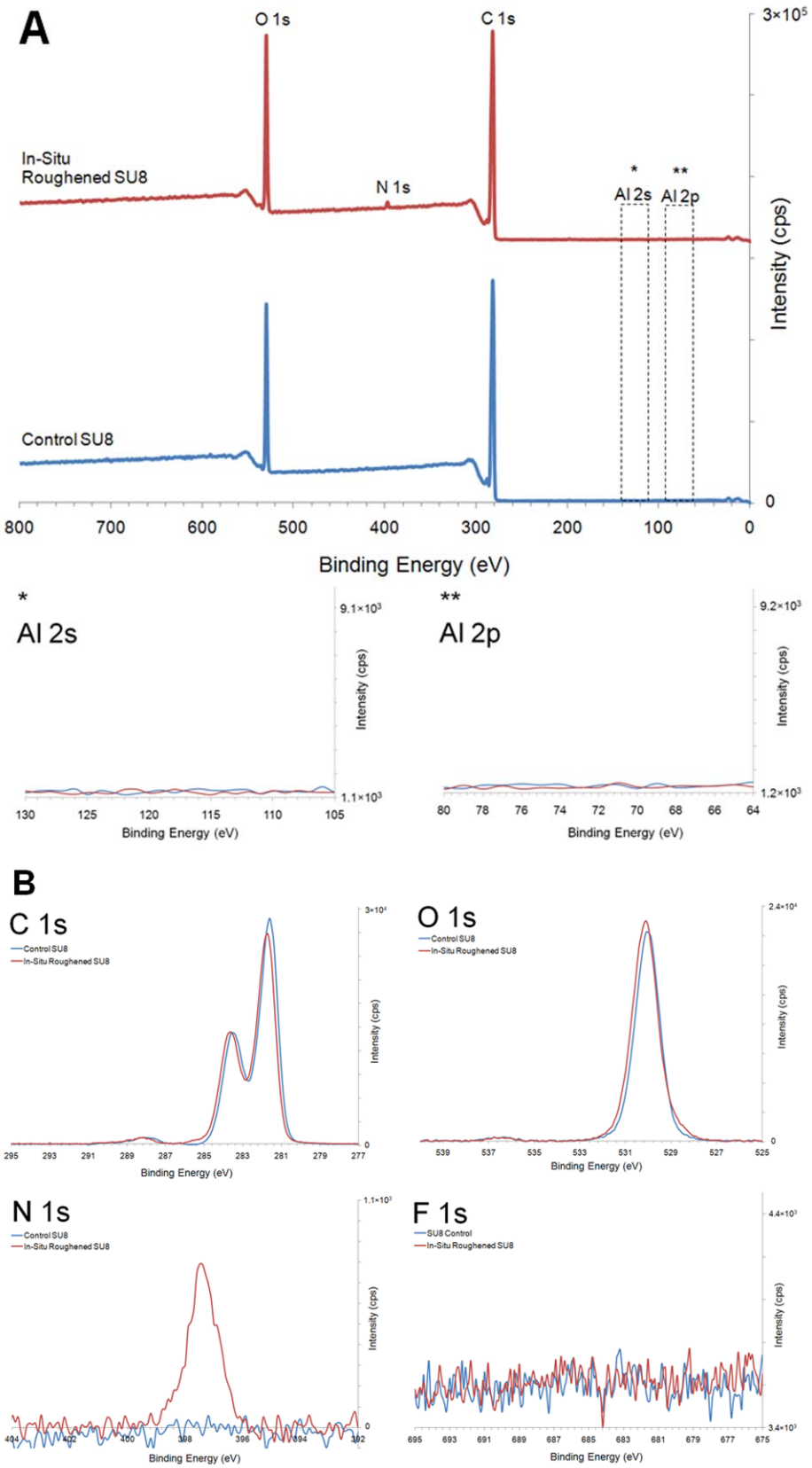

Figure S6. XPS spectra (A) of SU8 surfaces with corresponding high resolution scans (B).

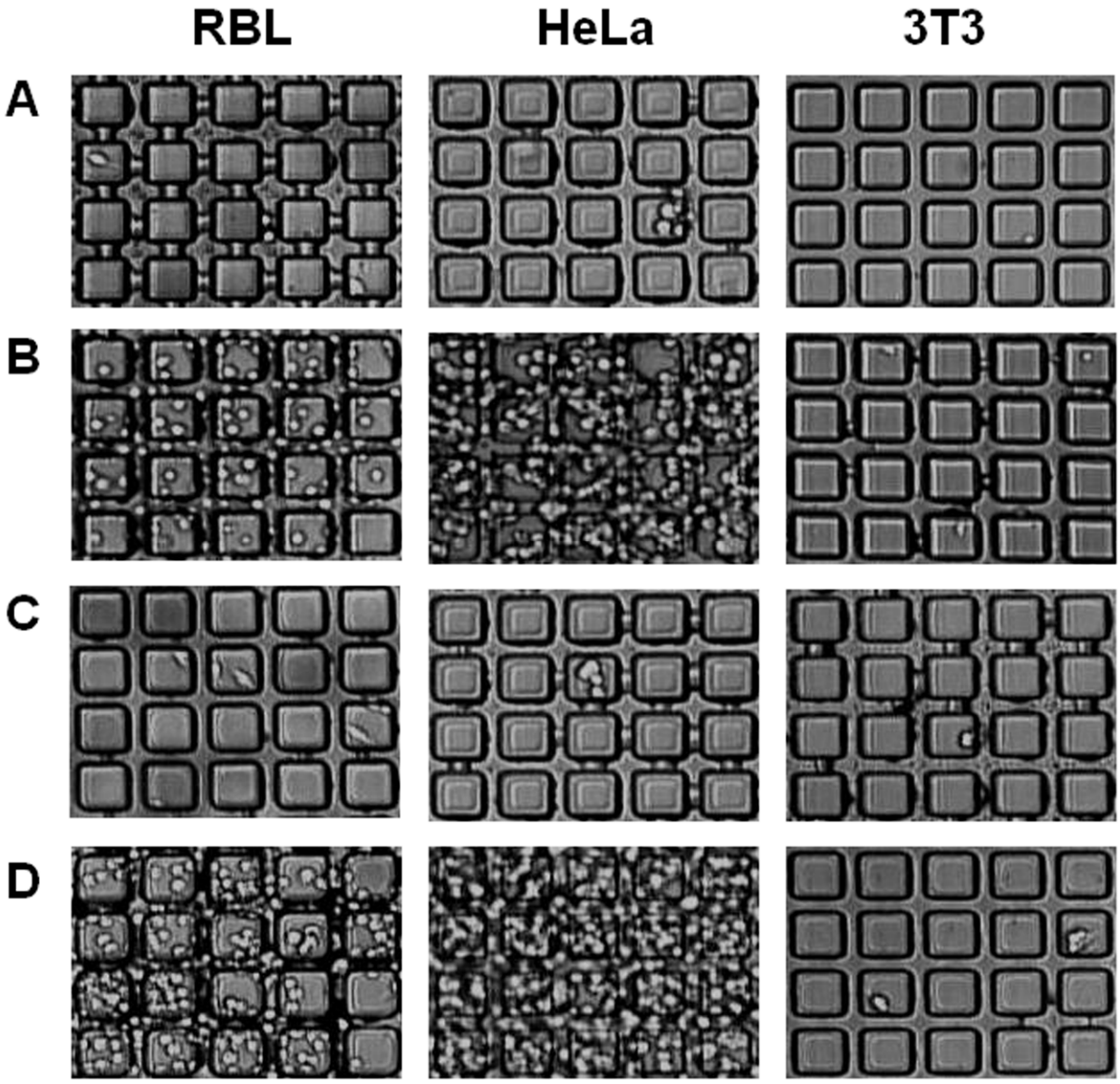

Figure S7. Typical micrographs illustrating cell attachment/growth on (A) SU8, (B) roughened SU8, (C) 1002F, and (D) roughened 1002F micropallet arrays for RBL, HeLa, and 3T3 cells. Shown are cells after 16 h of culture on the micropallet arrays.

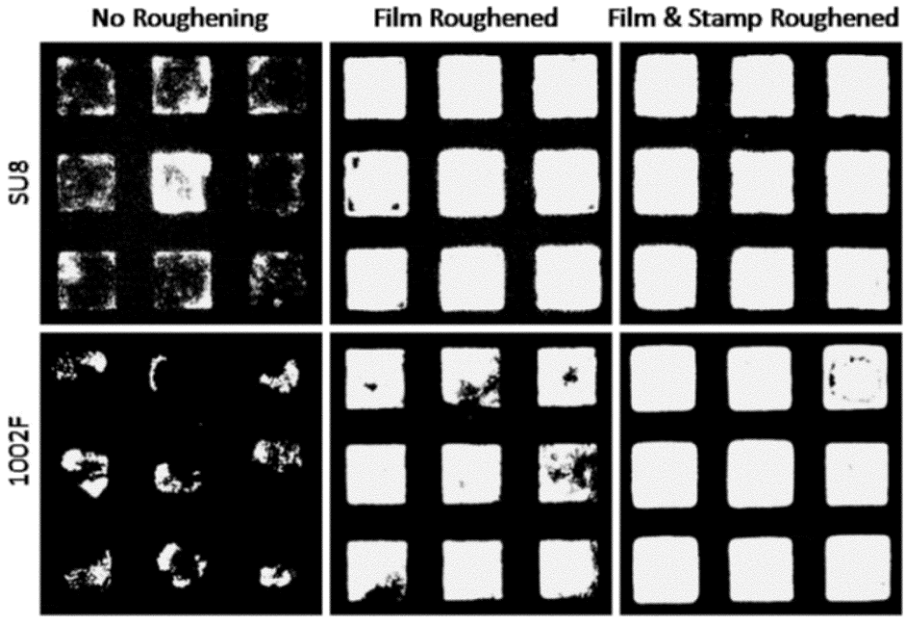

Figure S8. Fluorescence micrographs of BSA-Alexa 647 printed on SU8 and 1002F surfaces before and after roughening of the substrate or stamp. Each square is 100 μm on a side.