Electronic Supplementary Material (ESI) for Lab on a Chip.


## Supplemental Information

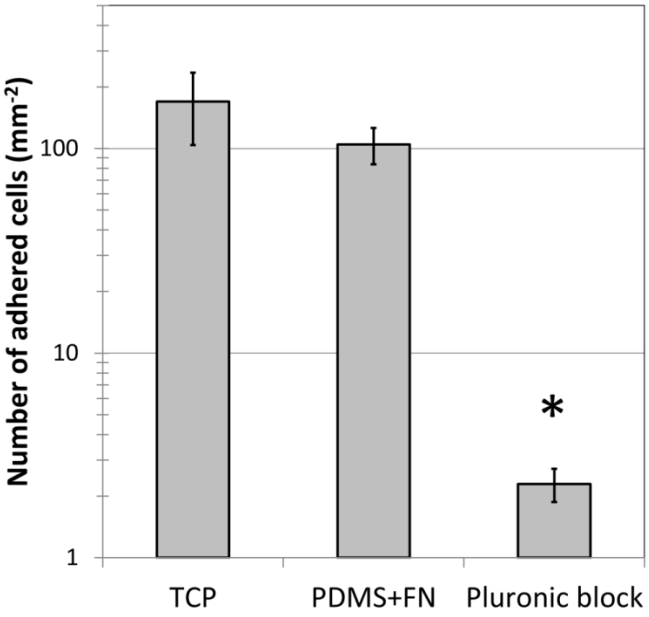


**Figure S1.** Adhesion of NIH3T3 fibroblast cell populations to adhesive and blocked regions of PDMS. Cells were plated at the same initial density of 10,000 cells/cm$^2$ on tissue culture plastic (TCP), PDMS coated with fibronectin (PDMS+FN), and PDMS that had been passivated following the procedure outlined for micropatterning. Cells were allowed to adhere for 8 hours, before the samples were rinsed three times in PBS and fixed in 4% formalin. The number of cells adhering to the passivated surface is reduced by ~2 orders of magnitude, demonstrating that the blocking protocol is suitable to generate adhesive patterns.

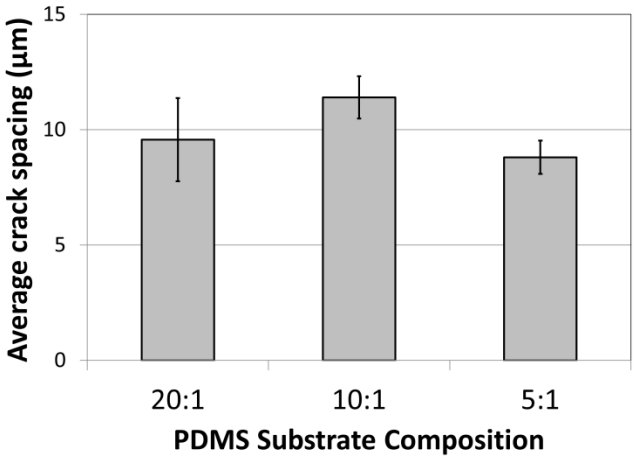


**Figure S2**. Crack spacing does not vary significantly with PDMS substrate composition. The monomer: crosslinker ratio was modified to change the mechanical properties of the PDMS layer. However, no significant differences in crack spacing were observed within this range ($p > 0.8$, data collected at 5% strain after 10 minutes of plasma oxidation).

**Supplemental Movie 1**. TRITC-BSA was adsorbed to adhesive micropatterns that span the width of the microgroove structures in PDMS. Confocal microscopy was used to probe the three-dimensional spatial arrangement of the candidate matrix protein, and movies generated by reslicing and extrapolating the collected data in ImageJ software. Movies demonstrating rotation about the (A) Y-axis and (B) Z-axis demonstrate that the micropatterned fiber-like adhesive structures are continuous across the complex topology presented by the microgroove structures (red = TRITC-BSA).

**Supplemental Movie 2**. C2C12 cells are cultured on the adhesive micropatterns, and imaged with confocal microscopy to demonstrate attachment of cells in the three-dimensional context. Fibronectin extracellular matrix proteins (green) preferentially adhere to the crack structures, and cells (red = actin, blue = nucleus) were cultured for 24 hours before fixing and imaging.