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

ELECTRONIC SUPPLEMENTARY INFORMATION

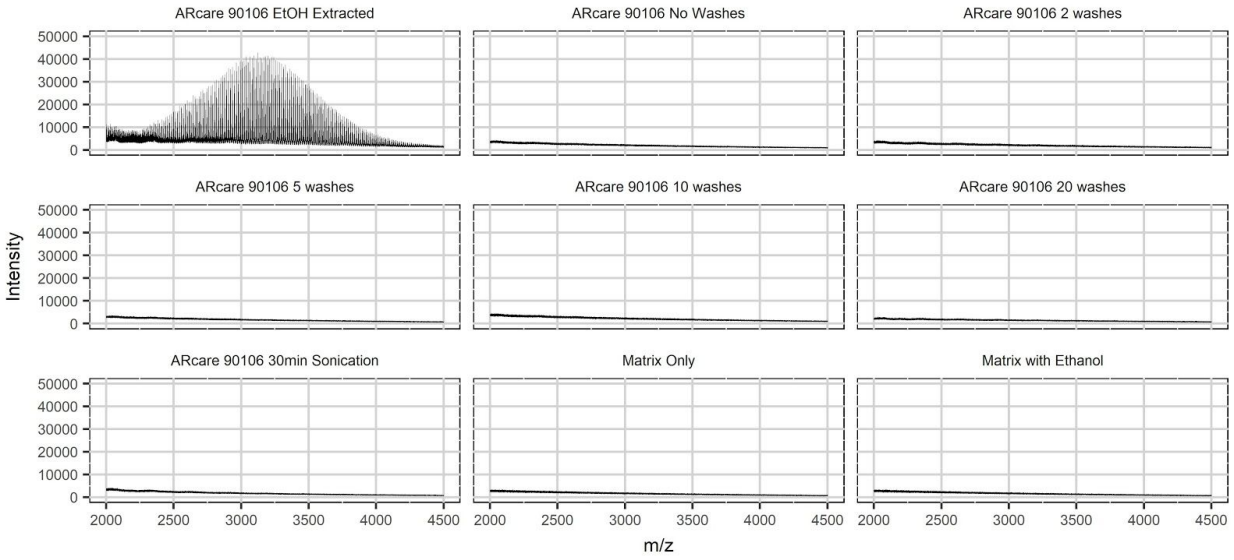

Figure S1 - MALDI-ToF analysis. A Bruker ultrafleXtreme and 2-(4'-Hydroxybenzeneazo)benzoic acid (HABA) matrix was used for analysis. Positive controls (100% ethanol incubated with tape to dissolve tape components) and negative controls (matrix only) were compared to water samples incubated in 2.7 mm open wells (PS-Tape laminate on glass). Prior to placing the PS-Tape laminate device on a glass substrate, the laminate was washed either 0, 5, 10, or 20 washes with DI H_2O. Each wash was performed by putting the tape into a 50 mL polypropylene tube, filling the tube with fresh DI-H_2O, shaking for 30 s, and removing the fluid. Water samples (5µL) from 70 different open wells were aggregated, lyophilized, and resuspended in 10 µL of ethanol, to significantly concentrate (35-fold) compounds released into the aqueous solution. Comparison of the positive and negative controls identified a range of m/z ratios where a gaussian distribution of peaks characteristic of polymer molecules could be detected. The gaussian region (present in positive controls, absent in negative controls) was then exported for all conditions and plotted using R for comparison.

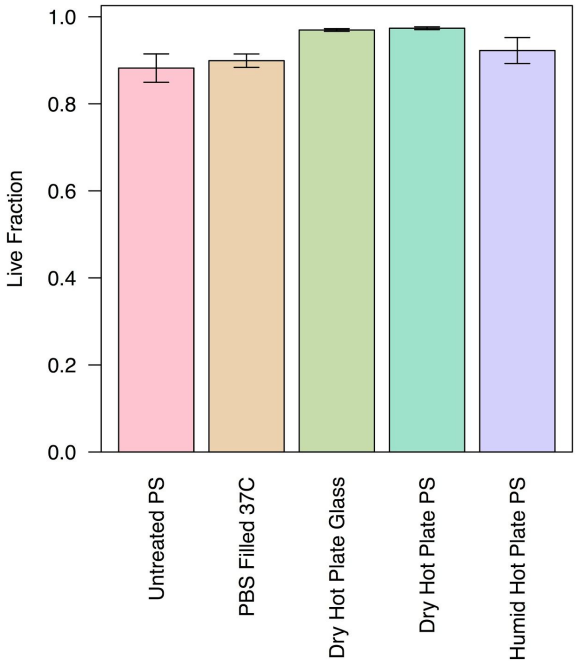

Figure S2 - Viability of MCF-7 cells in treated Tape channels. Viability of MCF-7 cells was measured via acridine orange/propidium iodide staining after 36 hrs of culture in straight channels (device (i) of Fig 5, 6 technical replicates per treatment) that were bonded to either glass or tissue culture polystyrene (PS) substrates. PS-bonded devices, after assembly, were either (1) Untreated; (2) Filled with PBS and incubated at 37℃ overnight; (3) Heated at 60℃ for 2 hrs; or (4) Heated at 60℃ for 2 hrs in a humidified chamber. Glass devices were heated at 60℃ for 30 minutes.

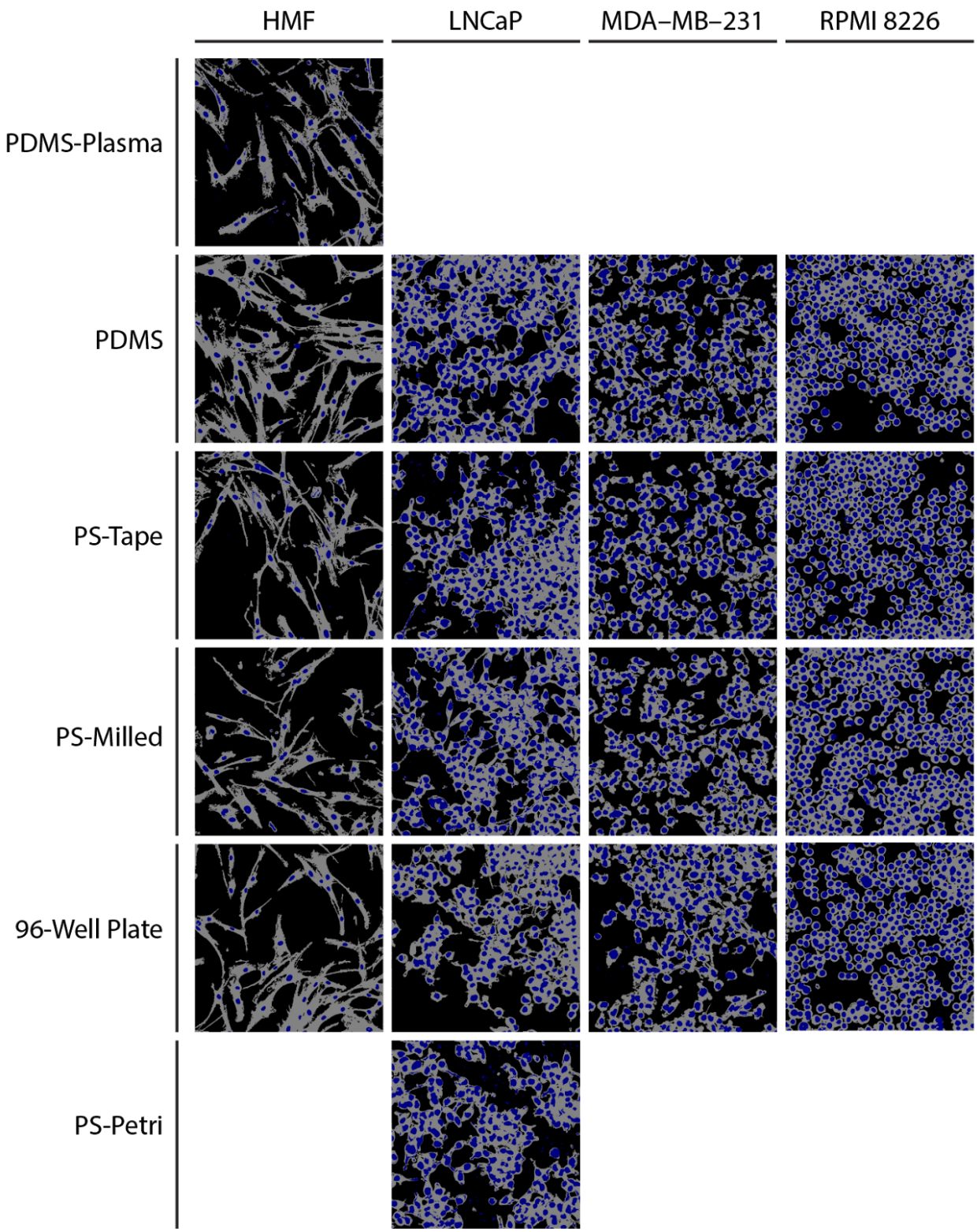

Figure S3 - Images of cell morphology in different devices. Brightfield and nuclear stained images are thresholded and overlaid to show regions of cytoplasm (gray) and nuclei (blue) for comparing morphology of cells with different adhesion characteristics in different culture conditions. PDMS-Plasma refers to a PDMS device in which the culture substrate was pretreated via oxygen plasma treatment, which is often used to promote adhesion. PS-Petri refers to PS-Tape device in a standard 60 mm tissue-culture treated polystyrene Petri dish (353002, Corning).

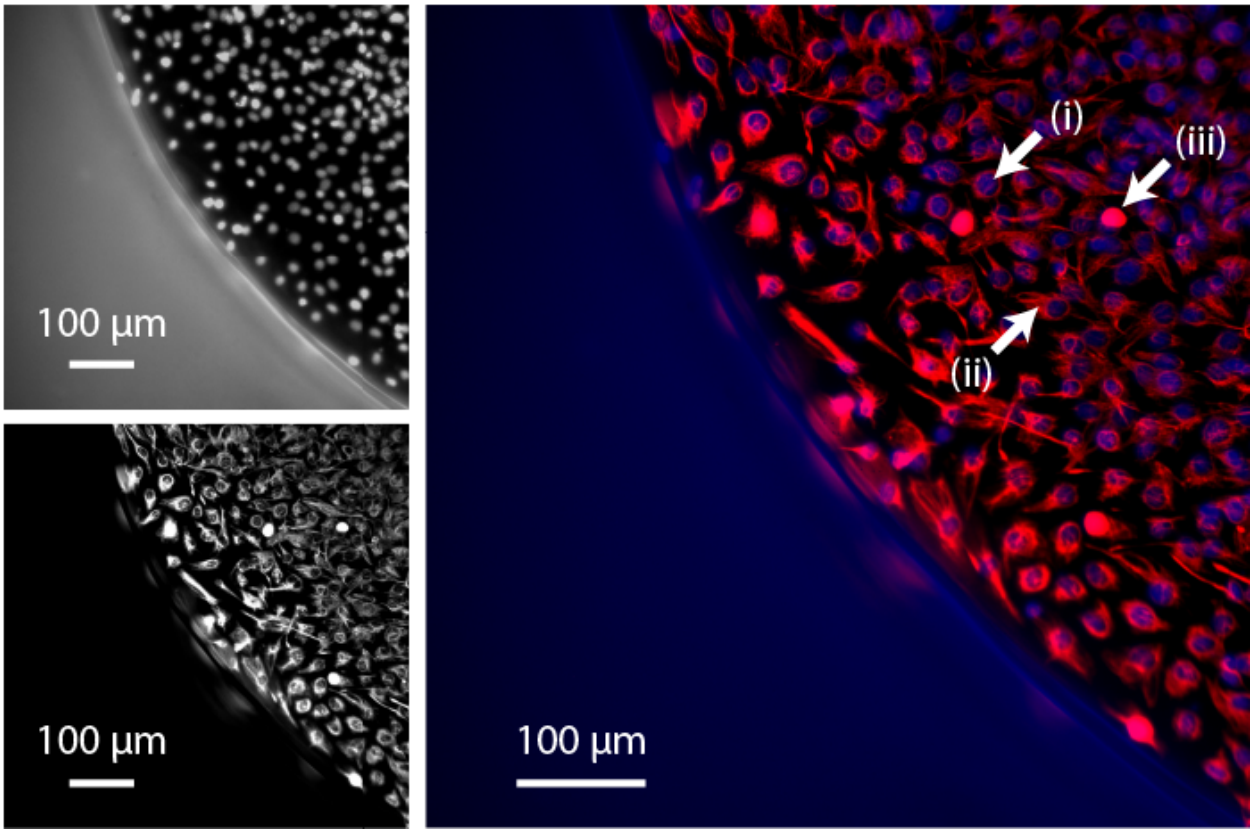

Figure S4 - Indirect Immunostaining in PS-Tape devices. NIH 3T3 cells were stained with Hoechst 33342 nuclear stain (top-left) as well as vimentin cytoplasmic immunostaining (bottom-left) with EdU (5 - ethynyl - 2' - deoxyuridine) nuclear staining. Imaging was performed on a ZOE Fluorescent Cell Imager (Bio-Rad) and imaged using excitation/emission channels of 355/433 nm and 556/615 nm. The false colored image in the right panel is a magnified overlay of Hoechst (i), vimentin (ii), and EdU (iii) staining.

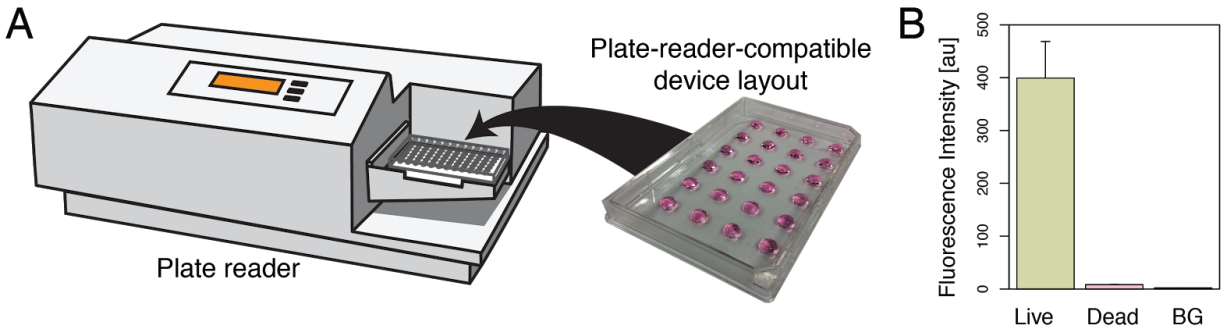

Figure S5 - 3D-cell culture and automated microarray read-outs. Collagen type I was neutralized with HEPES 1M solution (H0887, SIGMA-ALDRICH, St. Louis, MO, USA) using 1:1 ratio. Equal volumes of neutralized collagen type I were mixed with cells in culture media and loaded (7ul) into each microwell. After overnight incubation, 50 µl of % 0.5 FBS cell culture media were added to each set of adjacent microwells of a 3 microwell array (PDMS) on a flat tissue culture-treated omnitray aligned to a 96 well plate format. Cell viability and total cell counts were monitored at 1, 3, 4 and 7 days of culture using independent microwell array plates. LIVE/DEAD assay was used to obtain fluorescent read outs of viable cells following manufacturer's recommendation. Fluorescent intensity for each set of adjacent microwells was read in Gemini XPS plate reader (Molecular Devices, Sunnyvale, CA, USA).