Abstract Submitted
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Controlled-surface-wettability-based fabrication of hydrogel substrates with matrix tethering density variations[1] MD. MAHMUDUR RAHMAN, DONGHEE LEE, University of Nebraska-Lincoln, DIVYA BHAGIRATH, XIANGSHAN ZHAO, VIMLA BAND, University of Nebraska Medical Center, SANGJIN RYU, University of Nebraska-Lincoln — It is widely accepted that cells behave differently responding to the stiffness of extracellular matrix (ECM). Such observations were made by culturing cells on hydrogel substrates of tunable stiffness. However, it was recently proposed that cells actually sense how strongly they are tethered to ECM, not the local stiffness of ECM. To investigate the hypothesis, we develop constant-stiffness hydrogel substrates with varying matrix tethering density (the number of anchoring sites between the gel and the ECM protein molecules). We fabricate polyacrylamide gel of static stiffness and conjugate ECM proteins to the gel using a cross-linker. When treating the gel with the cross-linker, we control positioning of cross-linker solutions with different concentrations using superhydrophobic barriers on glass, functionalize the gel by pressing it to the aligned cross-linker solutions, and conjugate an ECM protein of constant concentration to the gel. We expect that the gel will be functionalized to different degrees depending on the concentration distribution of the cross-linker and thus the gel will have variations of matrix tethering density even with constant ECM protein concentration.

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