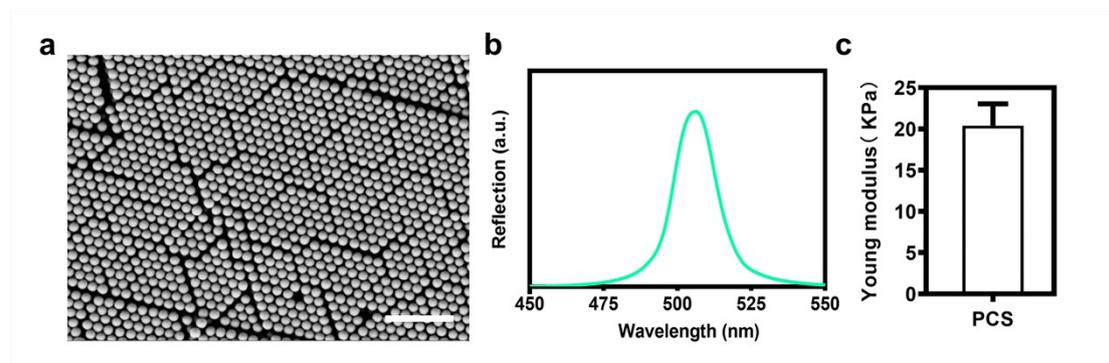


Supplementary Information

Visualizing and quantifying dynamic cellular forces with photonic crystal hydrogels

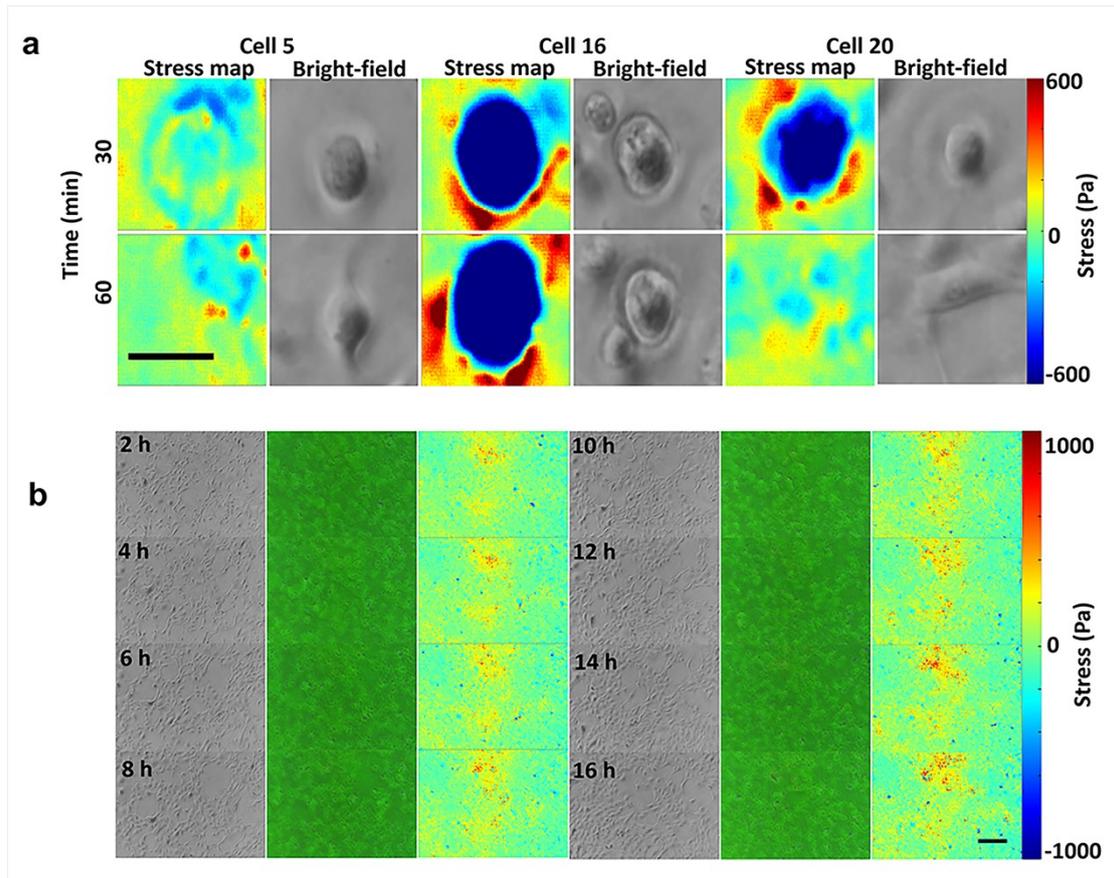
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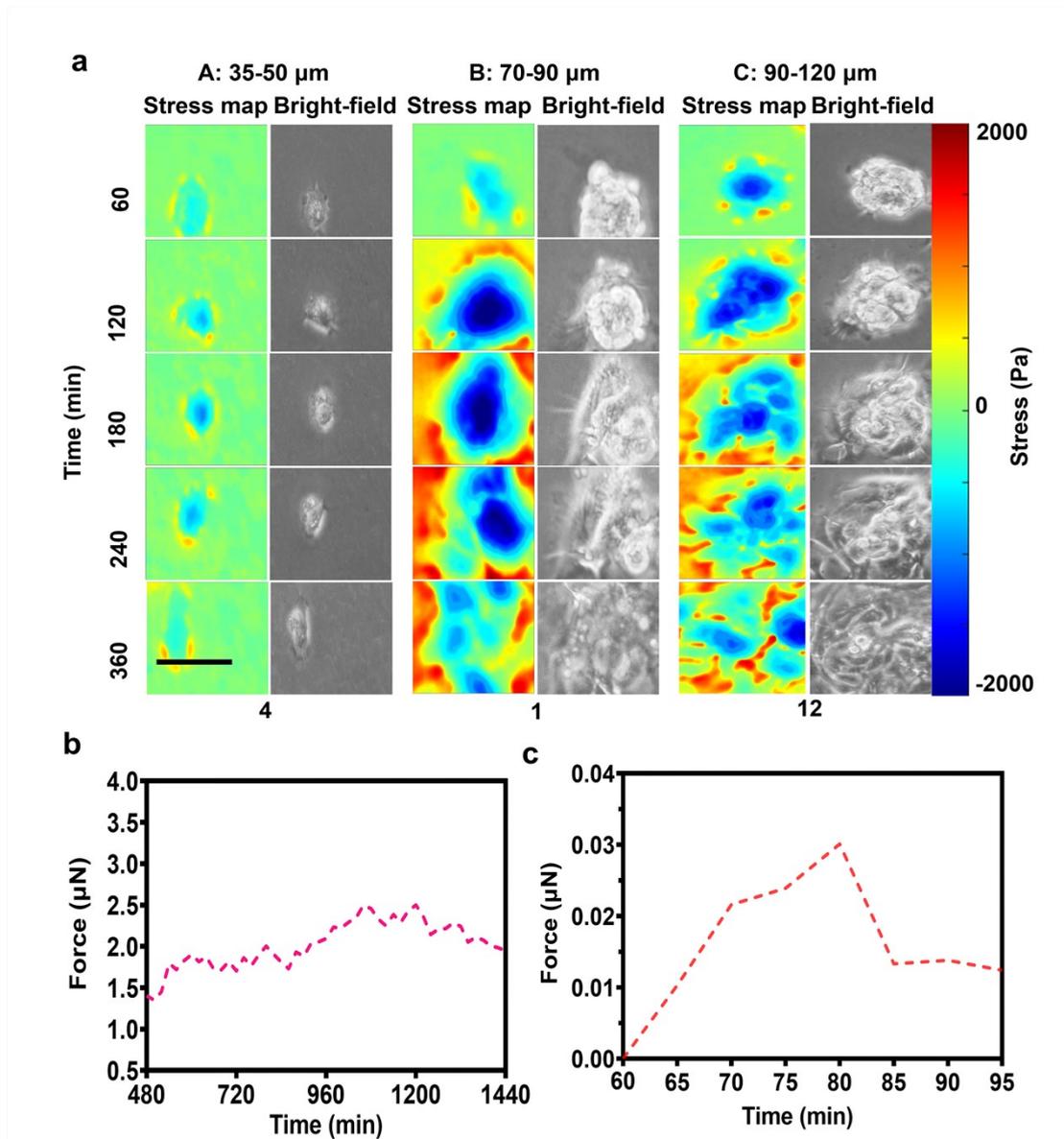


Supplementary Figures

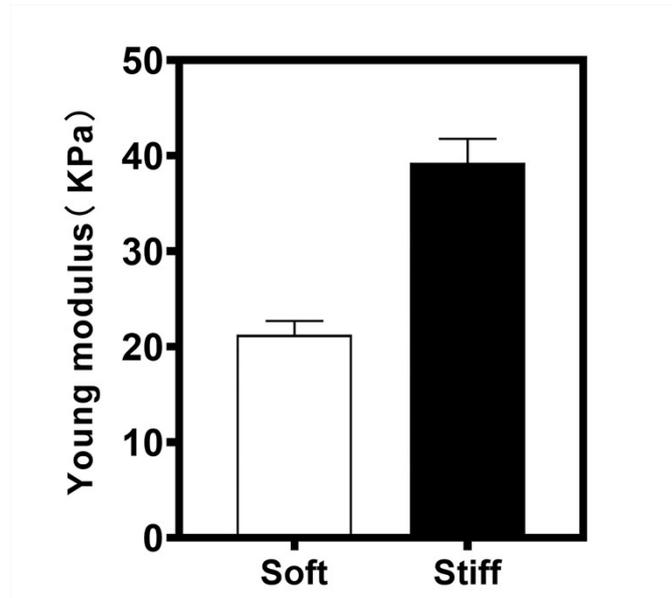
Supplementary Figure 1. (a) Scanning electron microscopy of silica colloidal particles for preparation of PCS. Scale bar, 1 μm. (b) Reflectance spectra of the PCS used in the experiment. (c) The elastic modulus of the PCS was measured using a nanoindentation instruments.



Supplementary Figure 2. (a) Bright-field and stress map of MDCK single cells within 30 min-60 min after cell seeding. Scale bar, 25 μm . **(b)** Bright-field, PCCFM images and stress maps of MDCK multicellular within 2 h-17 h after cell seeding. Scale bar, 250 μm .



Supplementary Figure 3. (a) Changes in the stress maps and corresponding bright-field images of cysts 4, 1, and 12 within 60 min to 360 min post-seeding. Scale bar, 100 µm. (b) Cellular forces of MDCK-generated cysts within 8 h-24 h after seeding. (c) Cellular forces of cells that had crawled out from the cysts within 60 min-95 min after seeding.



Supplementary Figure 4. The values of the Young's moduli of soft and stiff substrates.

Supplementary videos

Supplementary video 1. Bright-field imaging video of MDCK cells seeded onto PCS for 0-17 h.

Supplementary video 2. PCCFM imaging video of MDCK cells seeded onto PCS for 0-17 h.

Supplementary video 3. Bright-field imaging video of MDCK cyst fragments seeded onto PCS for 0-24 h.

Supplementary video 4. PCCFM imaging video of MDCK cyst fragments seeded onto PCS for 0-24 h.