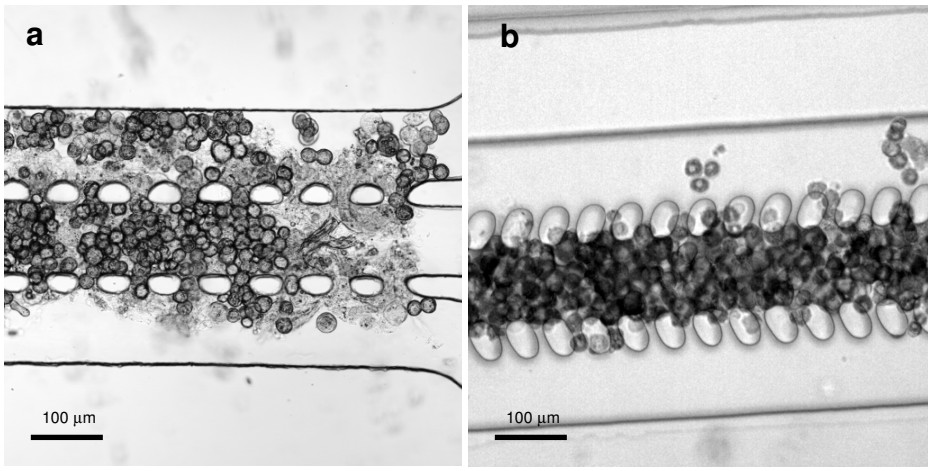
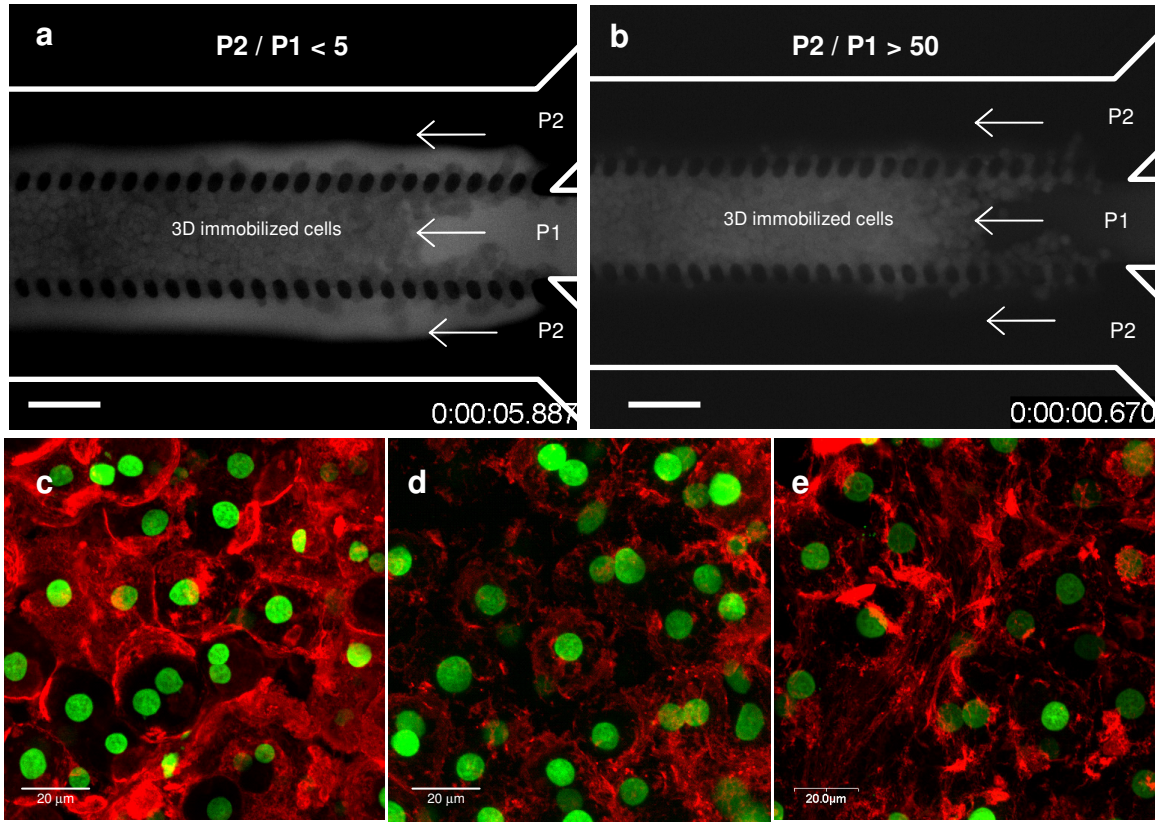


Toh *et al.*, 2006, Supplementary Figure 1



Toh *et al.*, 2006, Supplementary Figure 2

Supplementary Figure Legends

Supplementary Figure 1. Geometrical designs of micropillars affect the clogging tendency during cell immobilization process. Hepatocytes at cell density of $1.5x10^6$ cells ml^{-1} were dynamically seeded into a microfluidic channel at 0.5 ml hr^{-1}. (a) 50 μm x 30 μm semi-circular design (b) 30 μm x 50 μm elliptical design.

Supplementary Figure 2. The density of complex coacervated matrix can be modulated by varying laminar flow complex coacervation conditions. (a) – (d) By changing the relative flow rates of polyelectrolytes. (a) - (b) are flow profiles of a pair of polyelectrolytes (designated P1 and P2) in a microfluidic channel with immobilized cells when their relative flow rates (P2/P1) was < 5 and > 50 respectively. P1 and P2 were simulated with 0.2 % FITC solution and 1X PBS respectively. (c) - (d) show the complex coacervated matrix formed when P1 was represented by 1.5 mg ml^{-1} of Alexa Fluor-532 (AF-532) labeled methylated collagen and P2 by 3 % HEMA-MMA-MAA terpolymer solution at P2/P1 < 5 and P2/P1 > 50 respectively. At high P2/P1, the extent of complex coacervation was decreased due to limiting amount of P1, resulting in a loose matrix. (e) By changing the concentration of polyelectrolytes. The density of complex coacervated matrix was augmented by changing the concentration of AF-532-labeled methylated collagen (P1) from 1.5 mg ml^{-1} to 3.0 mg ml^{-1} while maintaining at the same P2/P1 as (d). Images in (c) – (e) were maximum projections of 30 μm optical sections. Heptoacytes nuclei were counterstained with SYTOX Green (Molecular Probes, USA).

Supplementary video. Cells are damaged during dynamic cell immobilization process. Hepatocytes in culture medium dosed with 50 μg ml^{-1} Propidium iodide (PI) were dynamically seeded into the 3D-

μFCCS at a flow rate of 1 ml hr^{-1}. Cells that turned fluorescent were indicative of damaged cell membrane sustained during the seeding process allowing PI to enter the cells.