Supplementary Data

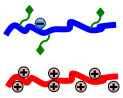

Figure S1. (a). Schematic of biotin modification and enzymatic degradation of alginate. Alginate biopolymer was biofunctionalized using biotin moieties incorporated in the base material. The gel network can be degraded by exposure to the bacterial enzyme alginate lyase that cleaves the backbone of the biopolymer. (b). Layer-by-layer assembly of biotin modified anionic polymer with cationic polymer.

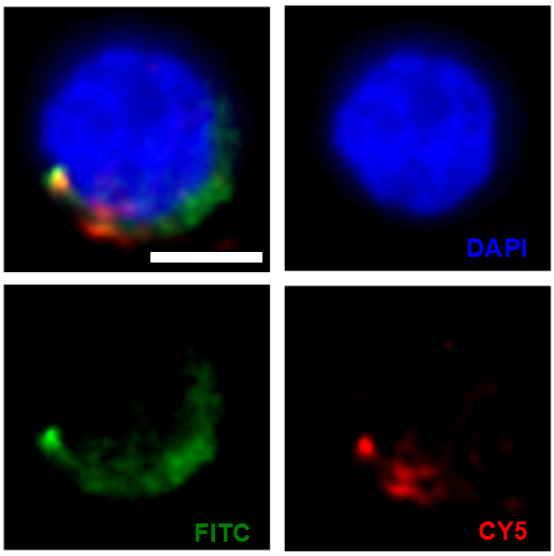

Figure S2. Fluorescent microscope images of released PC-3 cells that show small pieces of LbL films on the cell surface. The LbL film was made by FITC-labeled PAH and CY5-labeled avidin linker. The cells are stained with DAPI. The scale bar is 10 μm.

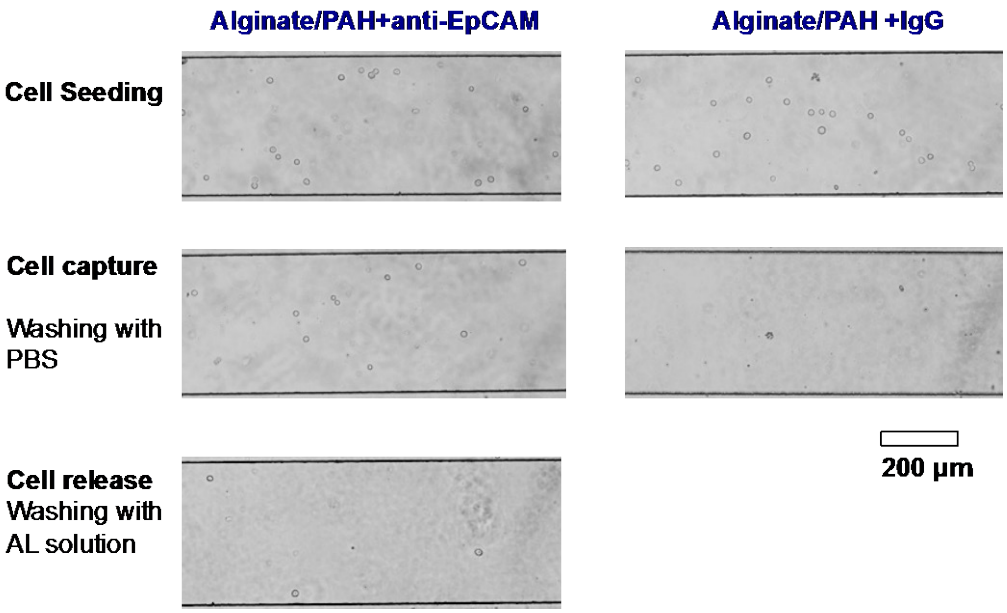

Figure S3. PC-3 Cells capture and release in a single-channel microfluidic device modified with EpCAM. IgG modified surface cannot capture any PC-3 cells.

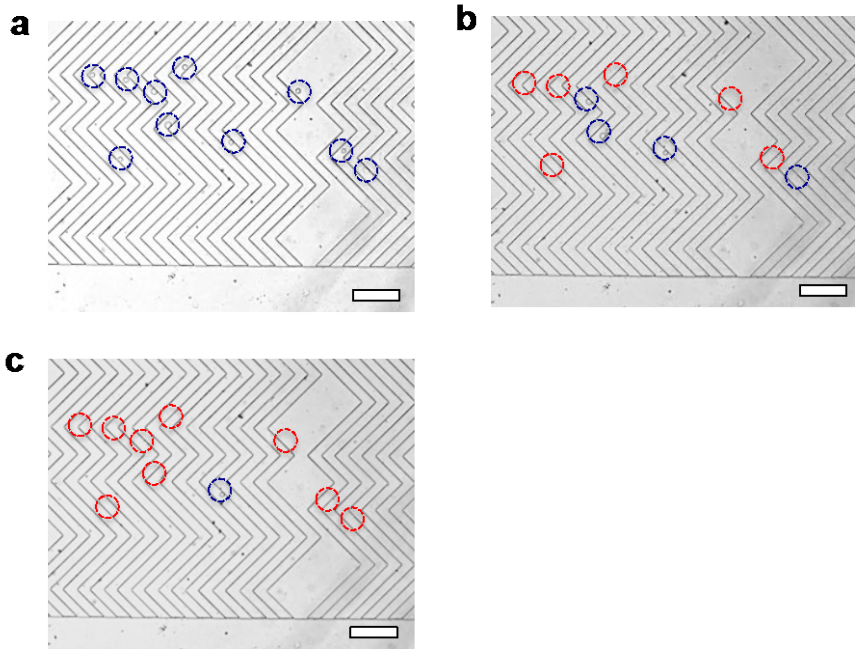

Figure S4. Spiked PC-3 cells in serum-free media were captured and released in an ^{HB}CTC-chip**.** (a)-(c), Optical microscope images for PC-3 cells that were captured, during release, and after release, respectively. Captured cells are indicated by blue circles, and released cells by red circles. The scale bar is 200µm.

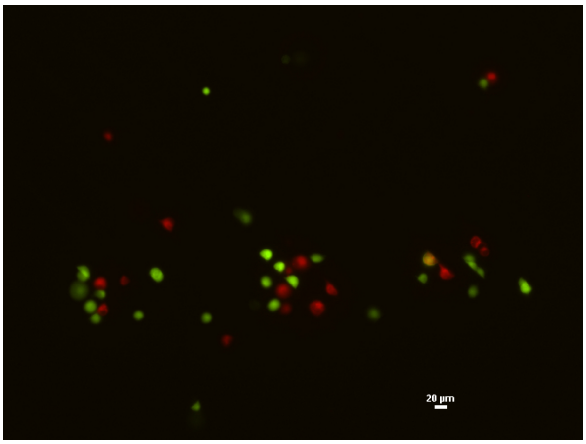

Figure S5. Captured lung cancer cell lines H1975 (stained in CellTracker™ Red) and H1650 (stained in CellTracker™ Green). The Scale bar is 20µm.

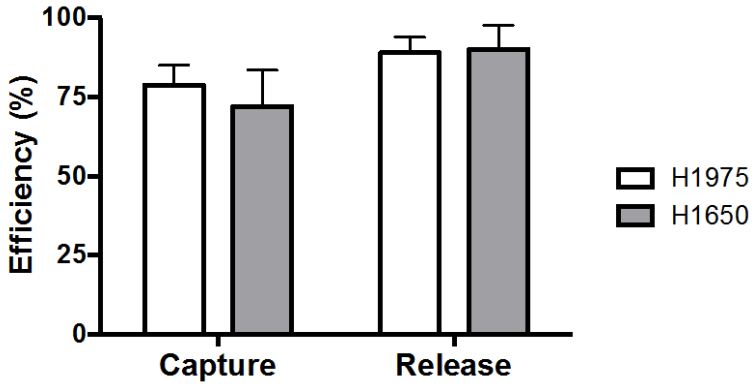

Figure S6. Capture and release efficiency of lung cancer cell lines H1975 and H1650 (n=3).