Lab on a Chip

Electronic Supplementary Information

Capture, Isolation and Release of Cancer Cells with Aptamer-functionalized Glass Bead Array

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4 Figures

1 Table

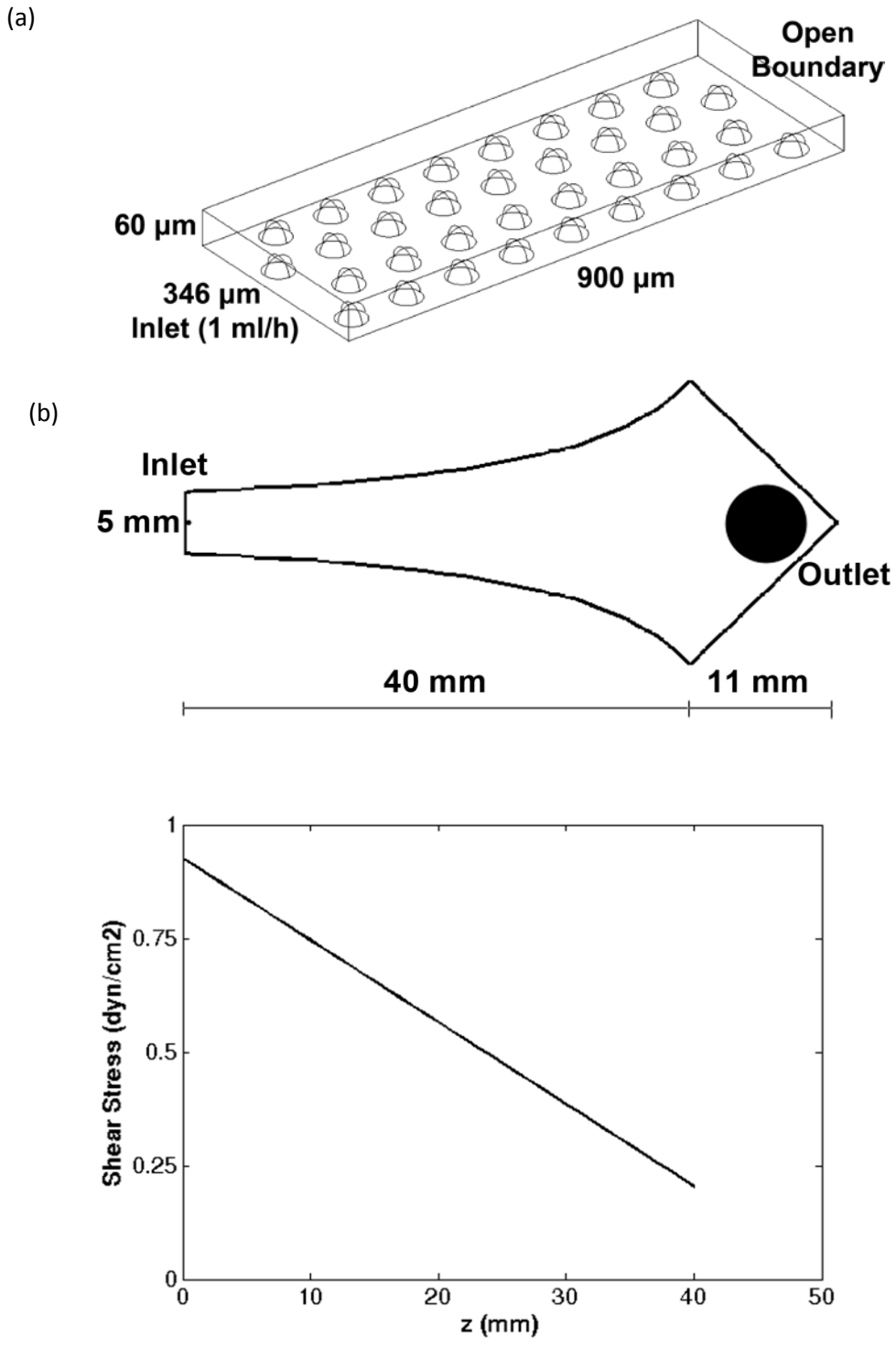

Figure S1. (a) The numerical model of a GB array channel with dimensions 346 µm (width) X 900 µm (length) X 60 µm (height). The GB loaded channel is used to analyze velocity pattern, shear stress, stream lines, trajectory and cell adhesion probability. The flow rate is set to 1 ml h^{-1} at the inlet and the other side is open boundary. (b) The device structure and dimensions of 60 µm thick Hele-Shaw device made with SU8 master. The plot shows gradually decreasing shear stress along the flow axis.

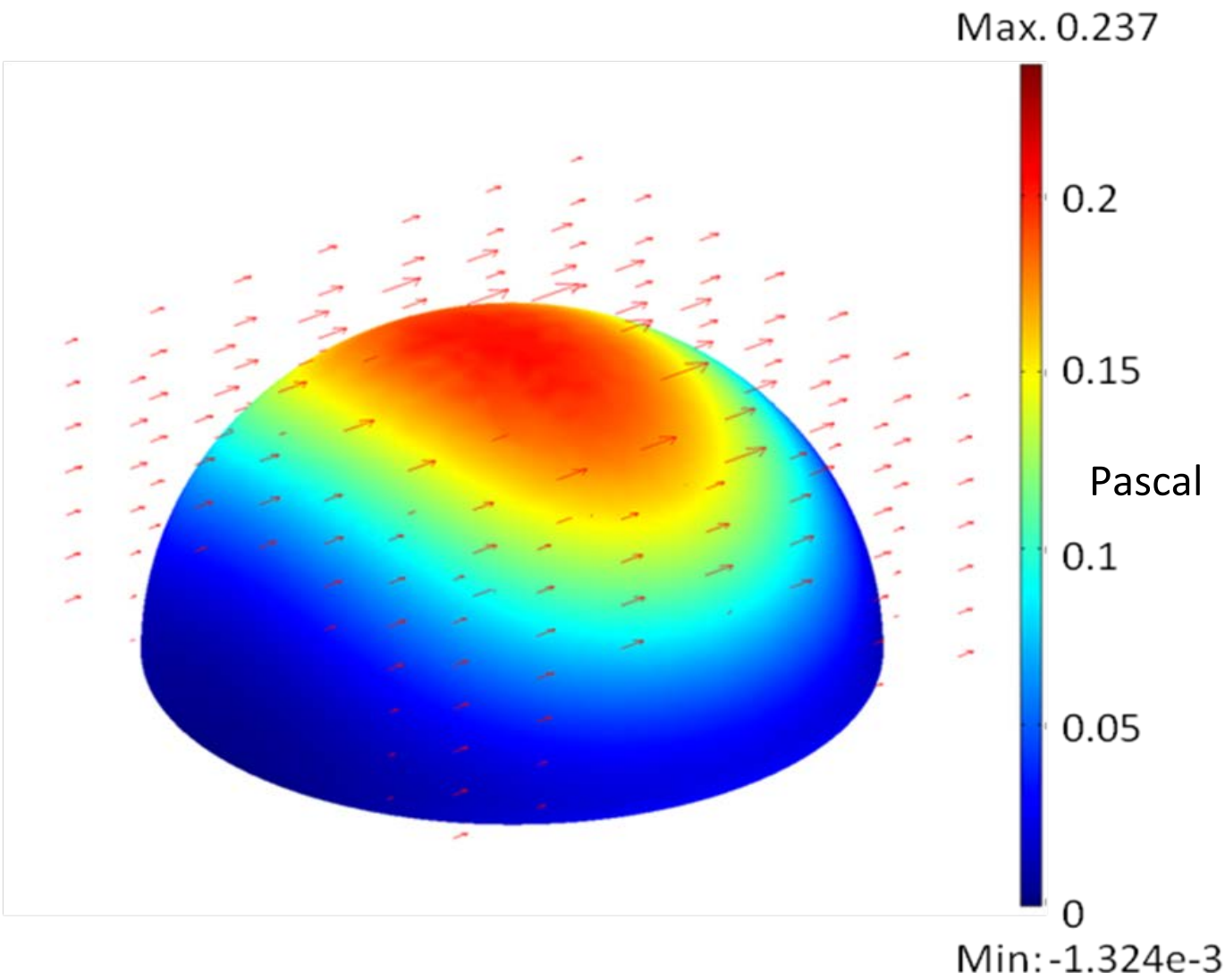

Figure S2. Shear stress on the surface of a glass bead. The maximum shear stress appears on the top of the bead and gradually decreases from top to bottom.

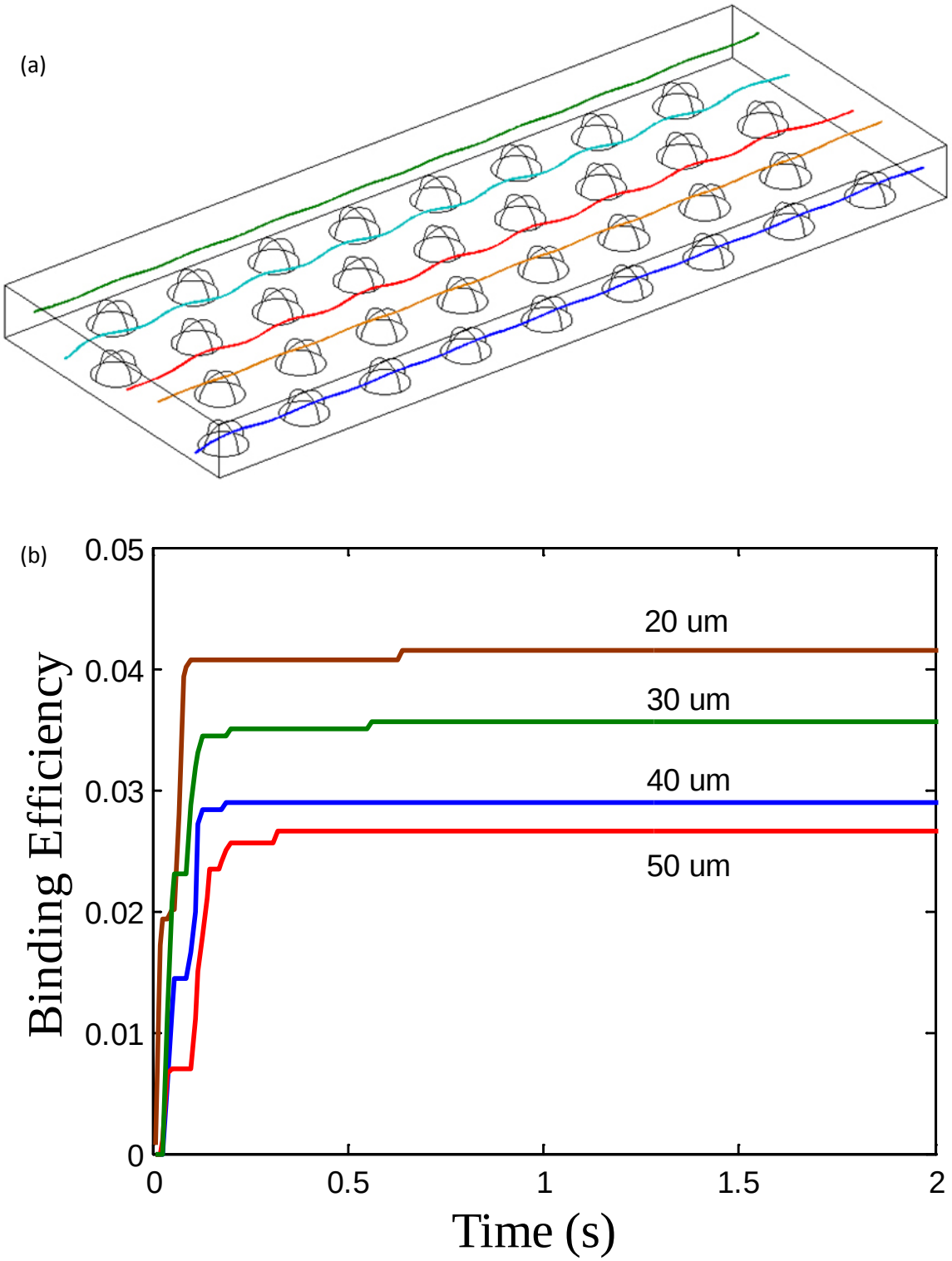

Figure S3. (a) Typical trajectories of cells injected in the microfluidic device; (b) Binding efficiency of cells as a function of time for devices with different separation distances. The shear stress increased from 0.237 Pa to 0.303 Pa when the distance between adjacent GBs decreased from 50 to 20 μm, and binding efficiency increased from 1% to 4%.

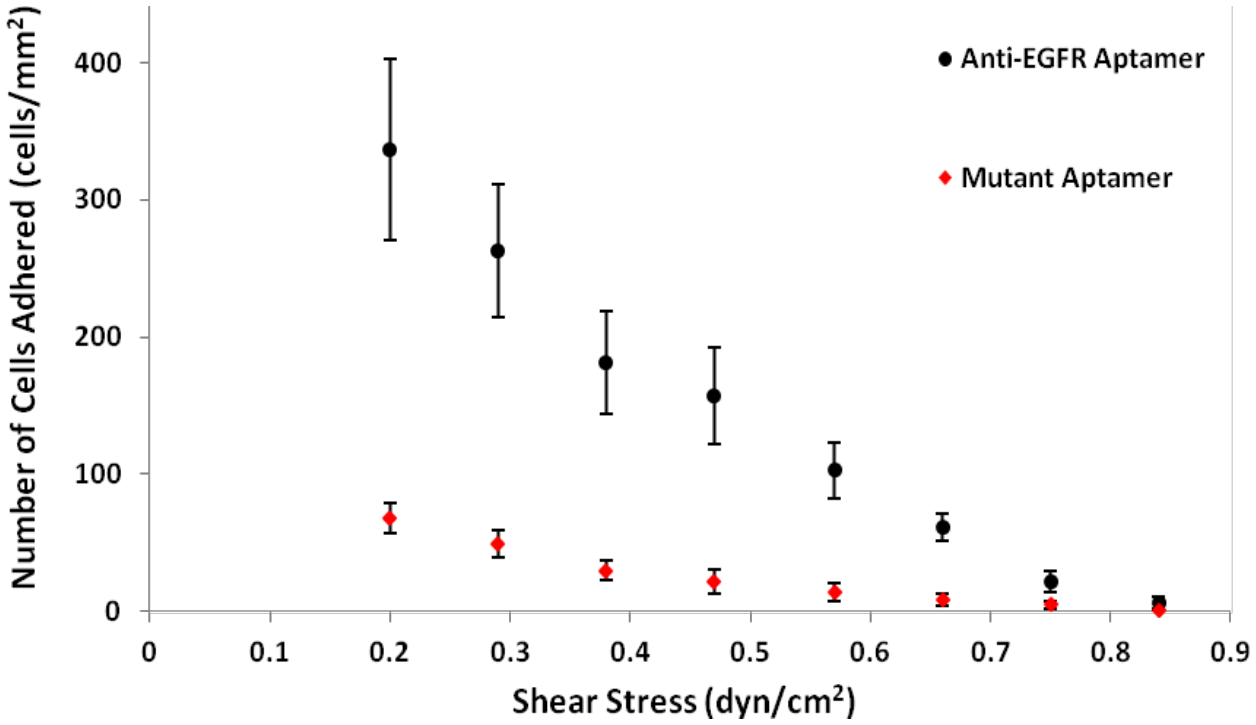

Figure S4. The number of hGBM cells binding to anti-EGFR and mutant aptamer functionalized glass substrates at increased shear stresses.

Table S1. Peclet Numbers corresponding to the shear stress depicted in Fig. S4 of ESI.

Shear Stress (dyn/cm^2)	0.2	0.29	0.38	0.47	0.57	0.66	0.75	0.84
Pe **($x10^5$)**	2.0455	2.9659	3.8864	4.8068	5.8295	6.75	7.6705	8.5909