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Lab-on-a-chip Single Particle Dielectrophoretic Traps WEINA WANG, HUA SHAO, KEVIN LEAR, Electrical & Computer Engineering Department, Colorado State University, Fort Collins, CO 80523-1373 — Cell-patterning and cell-manipulation in micro-environments are fundamental to biological and biomedical applications, for example, spectroscopic cytology based cancer detection. Dielectrophoresis (DEP) traps with transparent centers for stabilized cell and particle optofluidic intracavity spectroscopy (OFIS) were fabricated by patterning 10 μm wide, planar gold electrodes on glass substrates. The capturing strength of DEP traps was quantified based on the minimum AC voltage required to capture and hold varying diameter polystyrene or was it some other material, e.g. silica or PMMA microspheres in water as a function of frequency required under a constant flowrate of 20 μm/s. The maximum required trapping voltage in the negative DEP regime of $f = 1$ kHz to 40 MHz was 5.0 VAC. The use of AC fields effectively suppressed hydrolysis. New geometries of DEP traps are being explored on the basis of 3-D electrostatic field simulations.

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