

**Supplementary Movie 2.** Fluorescent beads in MPFC. Fluorescence intensity images of 200  $\mu$ m fluorescent polystyrene microspheres on the MPFC. Microspheres travel through the flow cell, confined by the sheath fluid, along the bottom of the flow cell. Lack of warping and elongation indicate that data acquisition rates are compatible with flow rate per unit time of the sample. Data acquisition was at 5 frames/second with a 10× lens (1.2 mm WD, 0.75 NA). The movie was created at 12 frames/second with the scale bar representing 200  $\mu$ m.