

Figure 1. (a) 3D schema of the microfluidics/microwave device. (b) Picture of the microwave resonator. The dimensions of the glass slide are 2.5cm by 7.5cm. (c) The amplitude response of the sensor under spectrum analyzer.

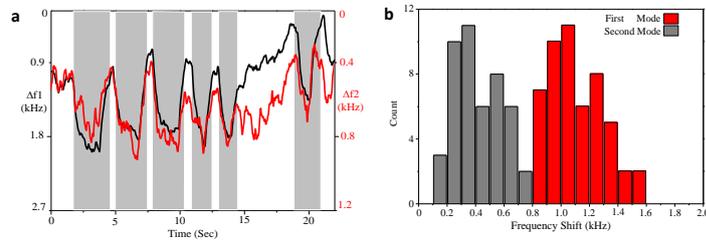


Figure 2. (a) Two-mode frequency shifts due to Skbr3 wt breast cancer cell passage measured by two parallel PLLs; the black trace shows the first mode, and the red trace shows the second mode. The offset frequencies of $f_1 = 974.734$ MHz and $f_2 = 1.85774$ GHz are subtracted for clarity. (b) Histogram of the frequency shift amount in both modes.

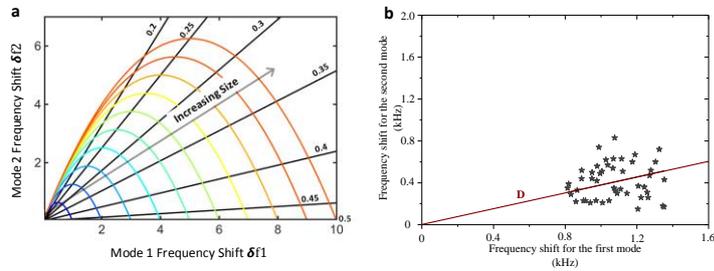


Figure 3. (a) Two-mode frequency shift domain. The straight contour lines are for position (normalized to unity, so 0.5 means the center of the beam). The contours for mass are shown as circular-shaped curves. (b) Initial location measurement in this study, representing the passage of a single cell from capillary D (in $1/3^{\text{rd}}$ of resonator length).