Supplementary Data

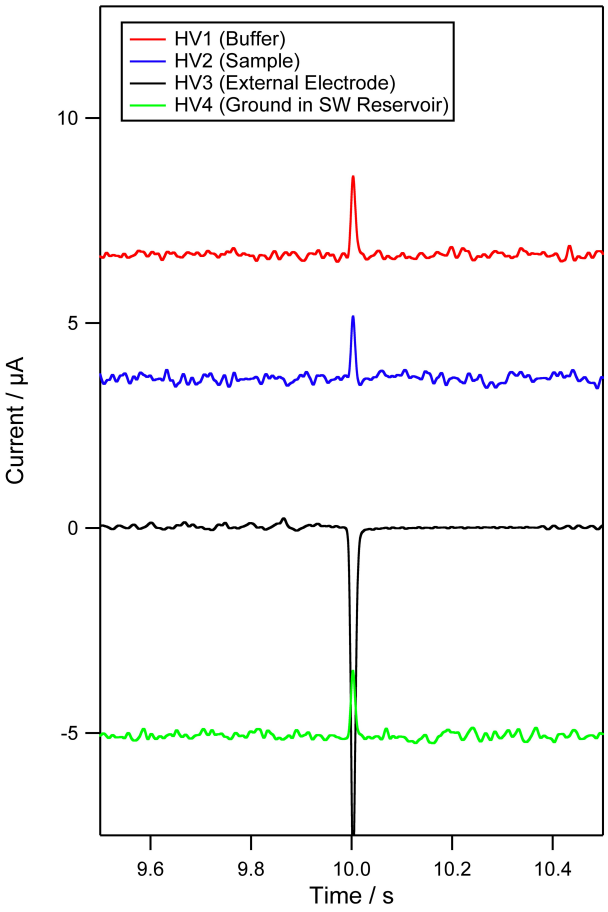

Fig. ESI-1 Current measurements at 4 different electrodes on a microfluidic device with a DE actuator (HV1 = BI, HV2 = SI, HV3 = external electrode, HV4 = ground at SW). The device has active electrode area of 0.50 mm^2 and a 20:1 PDMS DE layer. The buffer is the same run buffer as used previously. Initially, V_{cap} = 0 V. At t = 10 s, the capacitor is charged such that V_{cap} = -1000 V. The difference in current between the pre-charge and post-charge states is statistically insignificant as shown in Table ESI-1. The current spikes that occur at t = 10 s are due to the charging of FETs inside of the HV power supply.

Table ESI-1

Electrode	Pre-charge current / μA	Post-charge current / μA	Max noise / nA
HV1	6.68 ± 0.05	6.65 ± 0.07	367
HV2	3.64 ± 0.09	3.69 ± 0.06	436
HV3	0.03 ± 0.06	0.01 ± 0.01	189
HV4	-5.07 ± 0.05	-5.10 ± 0.02	368