Electronic Supplementary Material (ESI) for Lab on a Chip.

Supporting Information:

Pressure Stabilizer for Reproducible Picoinjection in Droplet Microfluidic Systems

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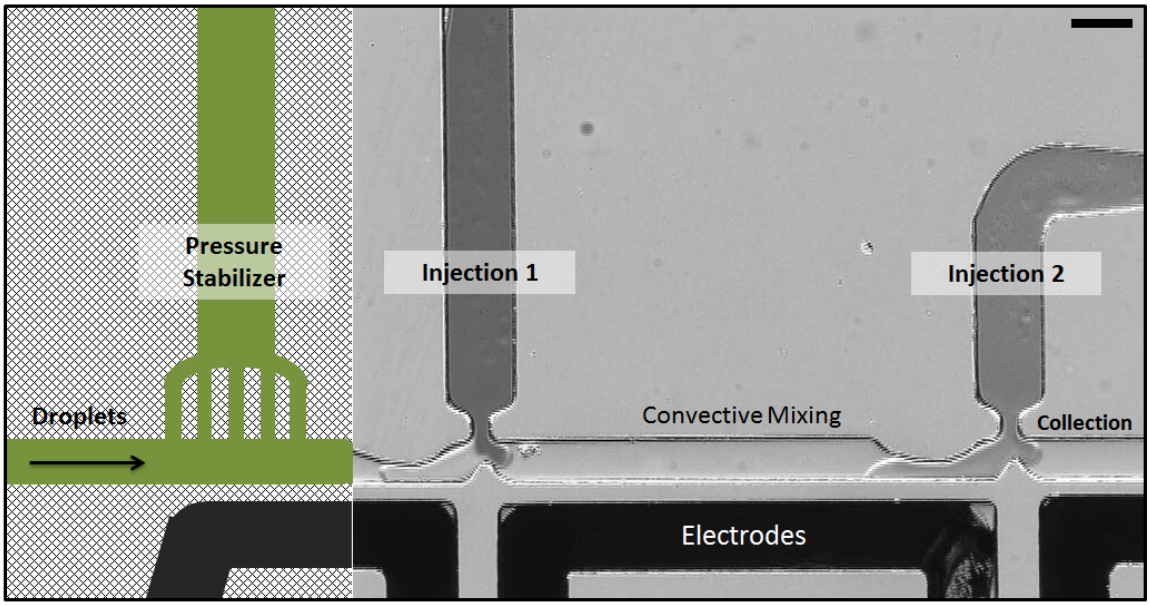

Figure S1. A system with two serial picoinjectors stabilized with a single pressure stabilizer (shown with a cartoon in the check patterns), demonstrated with color dyes. A single pressure stabilizer successfully reduces pressure fluctuation in the channel caused by on-demand actuation for droplet generation. Convection ensures complete mixing of droplet contents during translocation between two picoinjectors. This system can be used for a droplet MDA assay that requires multiple picoinjectors. For example, cell-containing droplets will be injected with chemical lysis solution from the first picoinjector, triggering immediate cell lysis and denaturation. The second picoinjector will then inject the droplets with neutralization buffer and amplification reagents.

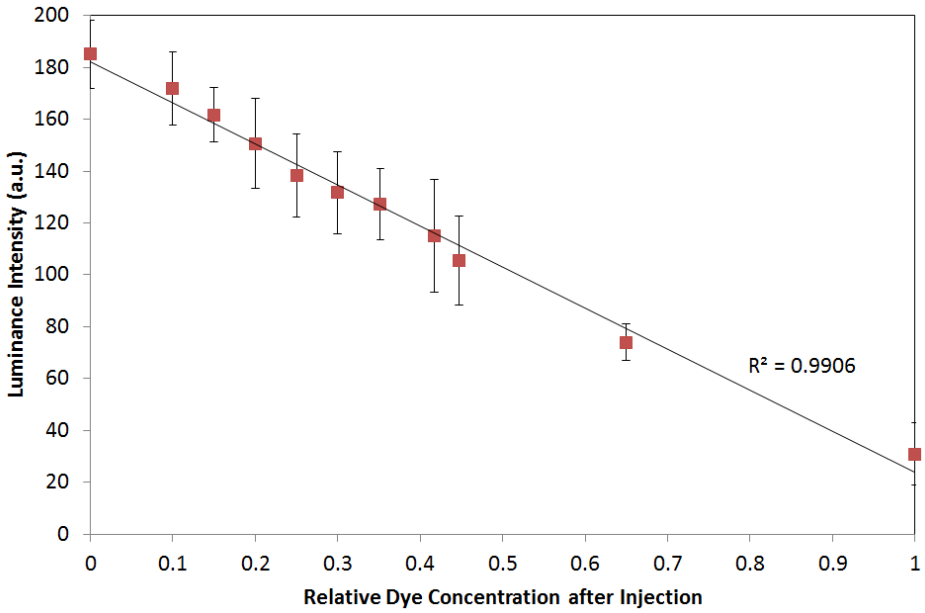

Figure S2. A calibration curve for the luminance intensity and the dye concentration. A food dye and a colorless liquid (DI water) were used. The images were recorded and processed at 8-bit resolution allowing 256 levels of the luminance to be measured. The fit indicates that the luminance intensity of the recorded image was linearly proportional to relative dye concentration.

Movie S1. Picoinjection operation in aid of pressure stabilizer for dye injection into droplets