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

Electronic Supplementary Information for Reconfigurable Microfluidic Dilution for High-Throughput Quantitative Assays

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Design of Single-Outlet Dilution Chip

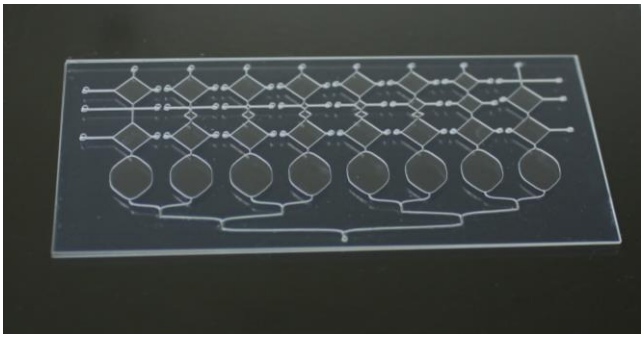

Fig. S1 Structure of the microfluidic dilution chip with a single outlet. To minimize manual pipetting steps, we have connected all eight outlets into a single outlet. To solve the unbalanced hydraulic resistances/volumes caused by the metering chambers, Laplace valves have been designed at the exit of each reaction chamber. In brief, with a manual withdraw of 100μL volume from the pipette at the common outlet, it can simultaneously move the metered fluidic contents into the reaction chambers in parallel.

Fluorescent Dilution Profile

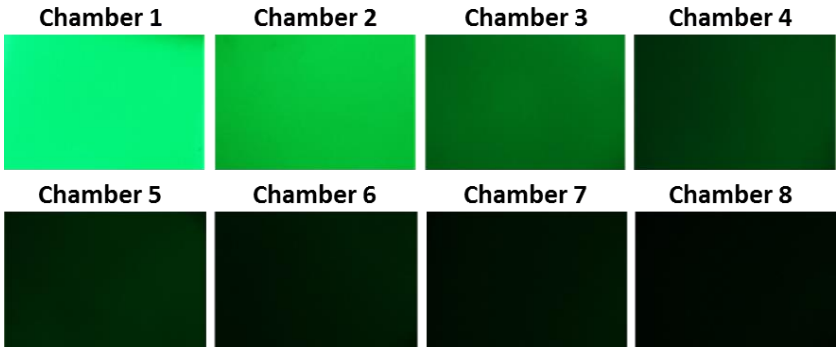

Fig. S2 Recorded microscopic images in the fluorescent dilution experiment. In the quantitative dilution experiment, BSA-FITC conjugate was excited by a pulsed high power LED at 490nm (Thorlabs M490L2 and DC2100) passing through a FITC filter set (Thorlabs, MDF-FITC). Filtered fluorescent images shown here were recorded in the centre of each reaction chamber by a CCD sensor of Canon 550D camera (2.5 s, ISO 6400).

Setup for Bubble-array Microstreaming Mixing

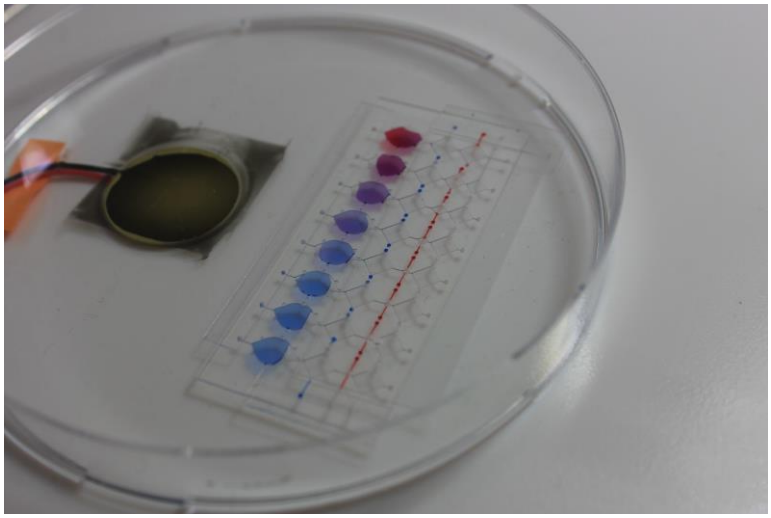

Fig. S3 Setup for bubble-array microstreaming mixing actuated by a piezoelectric transducer. For the bubble-induced acoustic microstreaming mixing actuated by a piezoelectric transducer, the microfluidic dilution chip was glued to the surface of a petri dish, with embedded air pockets surrounding the individual reaction chambers. A piezoelectric transducer of 15 mm in radius was also glue-bonded to the backside of the petri dish to produce the acoustic actuation.