Electronic Supplementary Information

Microfluidic Cap-to-Dispense (µCD): A universal microfluidic-robotic interface for automated high-precision liquid handling

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High speed images of droplet dispensing process.

The droplet has immediately emerged from the nozzle from the last ejection (t = 0.1ms); Within a short duration, the droplet tends to move away from the nozzle, forming a characteristic pendent shape (t = 0.6ms); At a critical distance, the liquid bridge would break off and the droplet completely departs from the nozzle (t = 0.8ms); As the droplet further moves, it gradually evolves into a nearly spherical shape with gravitational and inertial influences negligible under its dimensions, while the residue fluid retracts back into the nozzle (t = 1.5ms); Finally, the residue fluid completely returns to the nozzle surface and is ready for the next cycle of droplet ejection (t = 3.5ms).



Figure S1. Stroboscopic images showing droplet dispensing process.

Combinatorial mixtures comprised of 3 color dyes and biological reagents.



Figure S2. Photos of the 10 x10 array of combinatorial mixtures comprised of a)3 color dyes, with red representative of cell suspension, purple of IPTG, and blue of LB buffer; and b) biological samples of cell suspension, IPTG, and LB buffer.

Movie S1 Operational video of the automated μ CD