Supplementary Information

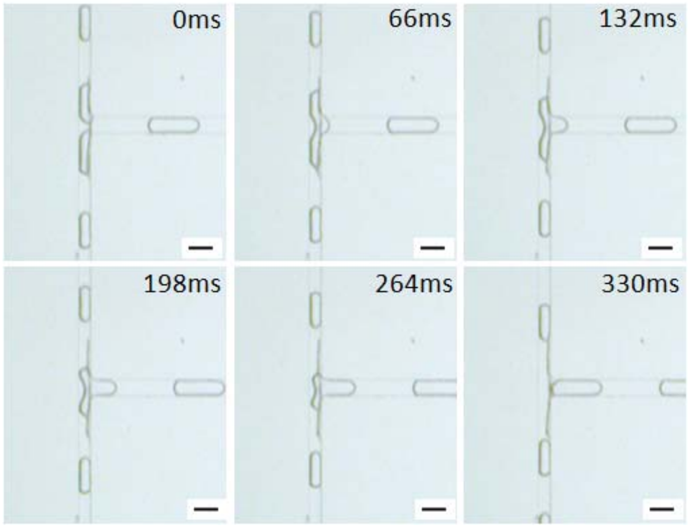

Fig.S1 Cotton fiber induced droplet coalescence. A cotton fiber (diameter in ~10μm) was fabricated into the microchannel as done in the PDMS chip embedded with the glass fiber. The process of the cotton fiber induced droplet coalescence was the same as that of the glass fiber induced droplet coalescence. Aqueous phases both were DI water. The oil phase was mineral oil containing 2.5% (v/v) Span 80. Sample volumes all were 4μL. Scale bar represented 100μm.

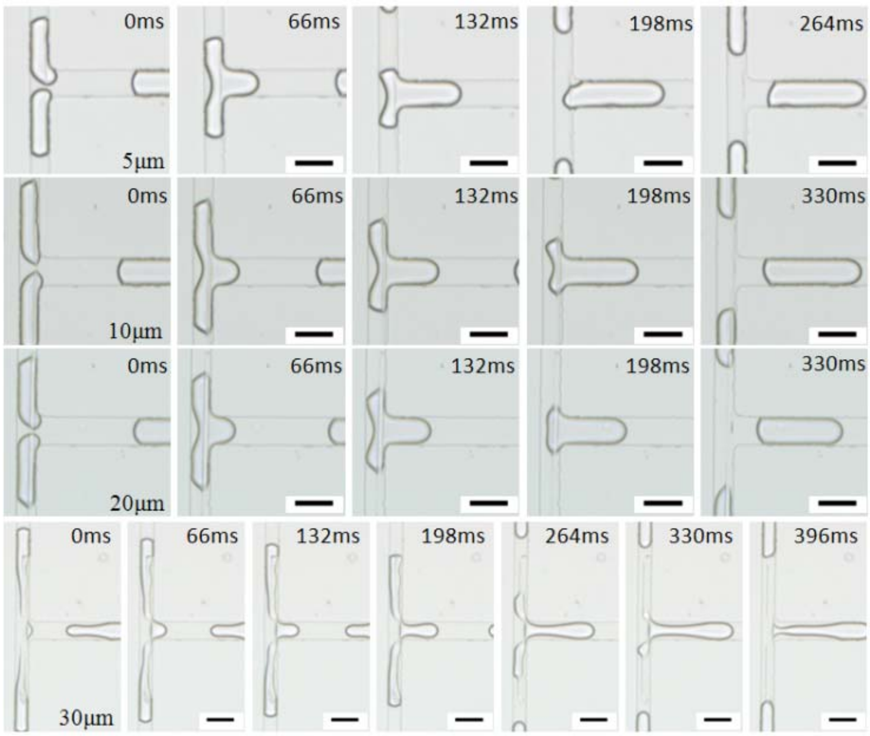

Fig.S2 Effect of the glass fiber diameter on the droplet coalescence. Glass fibers with diameters in 5μm, 10μm, 20μm, and 30μm were tested. Aqueous phases both were DI water. The oil phase was mineral oil containing 2.5% (v/v) Span 80. Sample volumes all were 4μL. Scale bar represented 100μm.

Table S1 Viscosity of glycerol aqueous solutions at room temperature (22℃)

Glycerol (v/v)	Viscosity (cP)
100%	1179
91%	294
83%	116
80%	87
75%	49
66%	24
60%	15

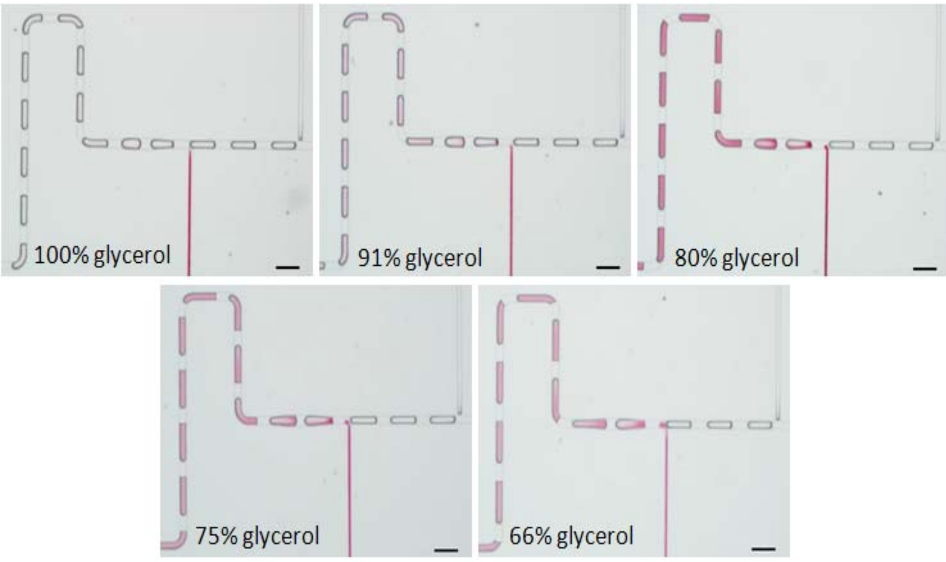

Fig.S3 Effect of the viscosity of the downstream aqueous phase on addition volume. The concentration of glycerol in water was changed to tune the viscosity of the aqueous phase. Notably, colour intensity did not correspond to addition volume due to the difference of dye concentrations. Addition volumes were calculated by measuring the change in droplet size before and after the coalescence. The upstream aqueous phase was DI water and sample volume was 4μL. Sample volume of the downstream aqueous phase containing dyes was 1μL. Scale bar represented 100μm.