

## Description of Additional Supplementary Files

File Name: Supplementary Movie 1

Description: **Inner streaming visualized by luminescence.** The transducer is turned on and off periodically to enhance mixing. Scale bar: 8 mm.

File Name: Supplementary Movie 2

Description: **The droplet-merging process.** Scale bar: 4 mm.

File Name: Supplementary Movie 3

Description: **Digital manipulation of a 65 nL droplet.** The working frequency is 104 MHz. The dimensions of the IDT are 400  $\mu\text{m}$   $\times$  600  $\mu\text{m}$ . The liquid surface shakes slightly due to the vibration from the switching of IDTs. Scale bar: 2 mm.

File Name: Supplementary Movie 4

Description: **Cyclic transportation of a nanoliter-scale droplet.** The IDT switching frequency is 1 Hz.

File Name: Supplementary Movie 5

Description: **Cyclic transportation of a nanoliter-scale droplet.** The IDT switching frequency is 3 Hz.

File Name: Supplementary Movie 6

Description: **On-demand droplet generation.** The IDT excitation frequency is 1 Hz.

File Name: Supplementary Movie 7

Description: **On-demand splitting of a 25  $\mu\text{L}$  droplet.** Scale bar: 5 mm.