

Microparticles self-assembly induced by travelling surface acoustic waves

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Rigid and elastic particles

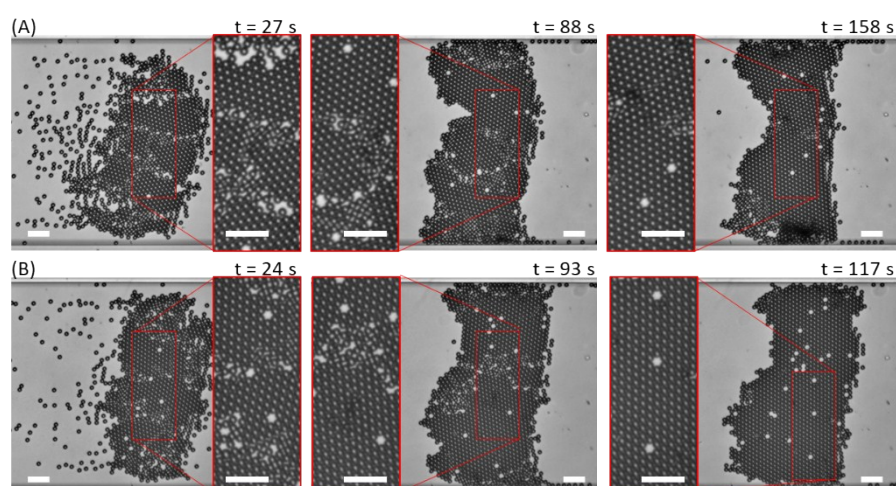


Figure S1. Self-assembly of microparticles suspended in a solution with 5% (A) and 10% (B) surfactant. The sample flowrate is 250 $\mu\text{l/h}$. The device actuation frequency and input voltage are 72 MHz and 5.1 V_{pp}, respectively. The scale bars are 50 μm in length.

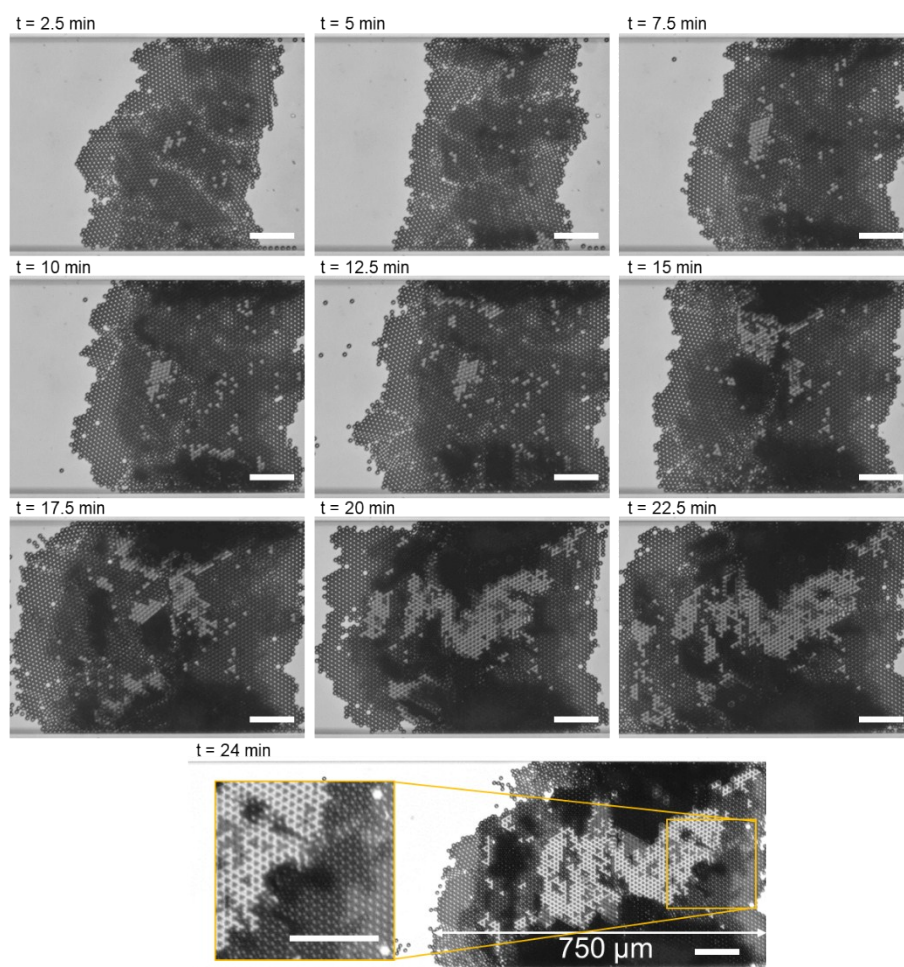


Figure S2. Experimental images for self-assembly of microparticles with a 5% surfactant into multiple layer crystalline structure. The sample flowrate is 250 $\mu\text{l/h}$. The device actuation frequency is 72 MHz, and the input voltage is increased from 6.9 V_{pp} to 8.6 V_{pp} . Scale bars are 100 μm in length.

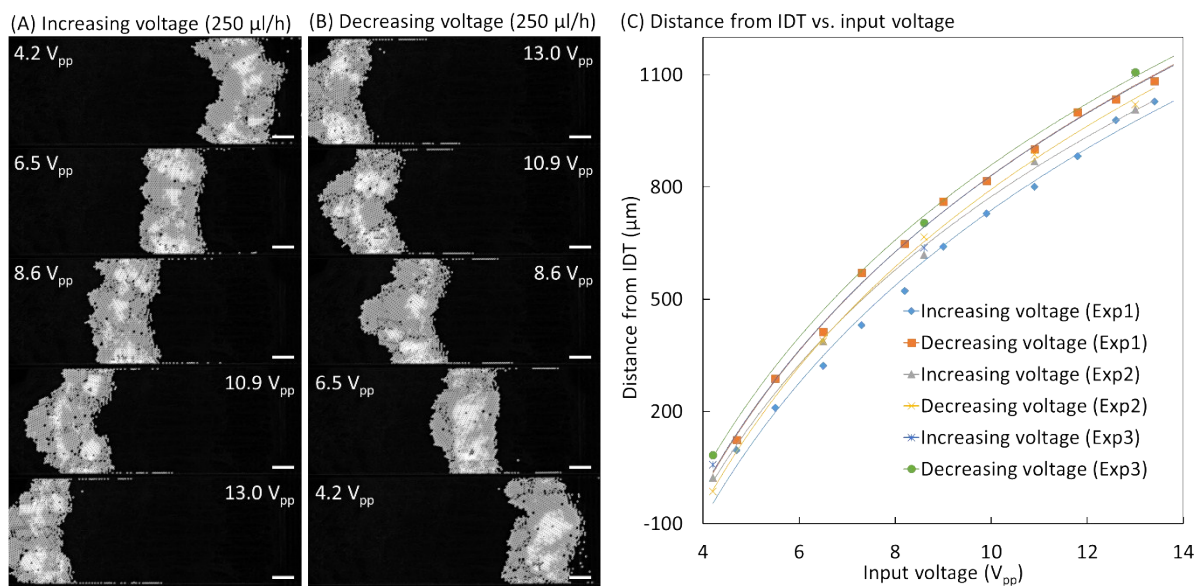


Figure S3. For a constant sample flowrate of 250 μl/h, the input voltage is increased (A) from 4.2 V_{pp} to 13.0 V_{pp} and then decreased (B) to 4.2 V_{pp} for 72 MHz frequency signal as the colloidal structure moved leftward from the IDT and then back. Scale bars are 100 μm in length. (C) The colloidal structure distance from the IDT is plotted against variable input voltage for three different experiments.

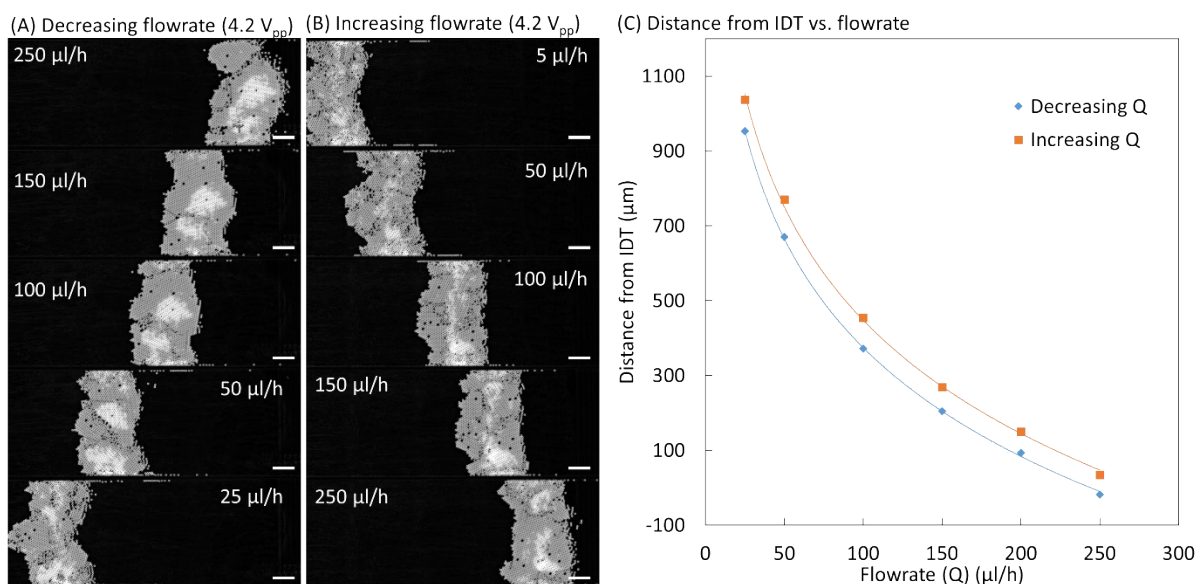


Figure S4. For a constant input voltage of 4.2 V_{pp}, the sample flowrate is decreased from 250 μl/h to 25 μl/h (A) and then increased to 250 μl/h (B) as the colloidal structure moved leftward from the IDT and then back. Scale bars are 100 μm in length. (C) The colloidal structure distance from the IDT is plotted against flowrate.

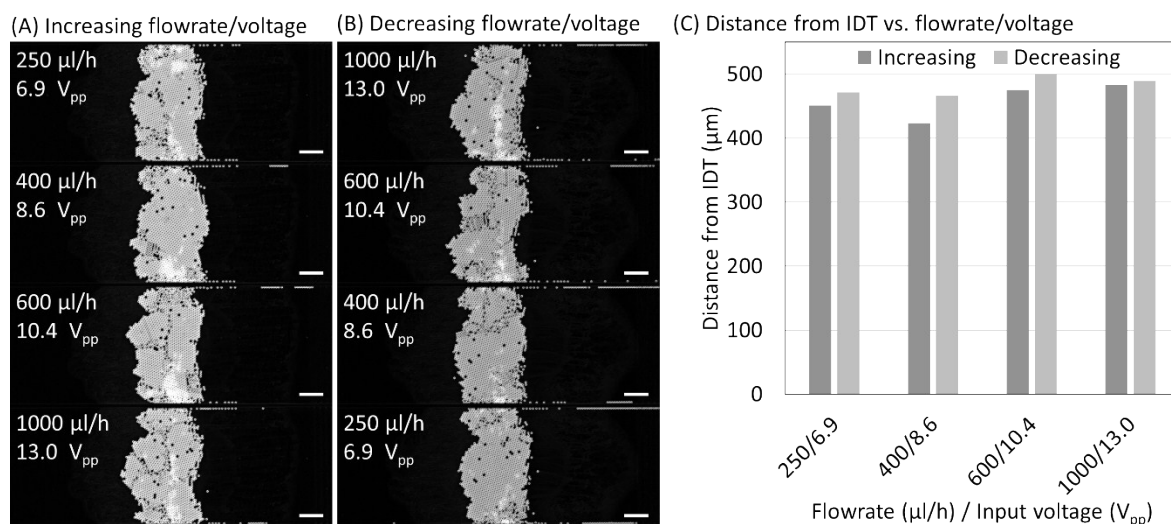


Figure S5. For an approximate consistent position of the colloidal structure inside the microchannel, a combination of input voltage and flowrate is respectively increased (A) and decreased (B) as the colloidal structure remained unmoved. Scale bars are 100 μm in length. (C) The colloidal structure distance from the IDT is plotted against flowrate and input voltage combinations.

Movies captions

Movie 1: Single layer crystal formation. (see also Fig. 2)

Movie 2: Single layer crystal formation without the background removed. The surfactant volume ratio is 10%. (see also Fig. S1)

Movie 3: Multiple layer crystal formation. (see also Fig. 3)