

## Supplementary Information

### **Experimental and numerical studies on standing surface acoustic wave microfluidics**

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**Table 1. Parameters used in the simulations**

	Water	Polystyrene beads	PDMS	Parameters of SAW	
Density, kg/m <sup>3</sup>	997	1050	965	Acoustic phase velocity of SAW, m/s	3900
Speed of sound, m/s	1495	2350	1080	Frequency, MHz	13
Dynamic viscosity, Pa·s	0.001	-	-	Vibration amplitude of SAW, nm	1

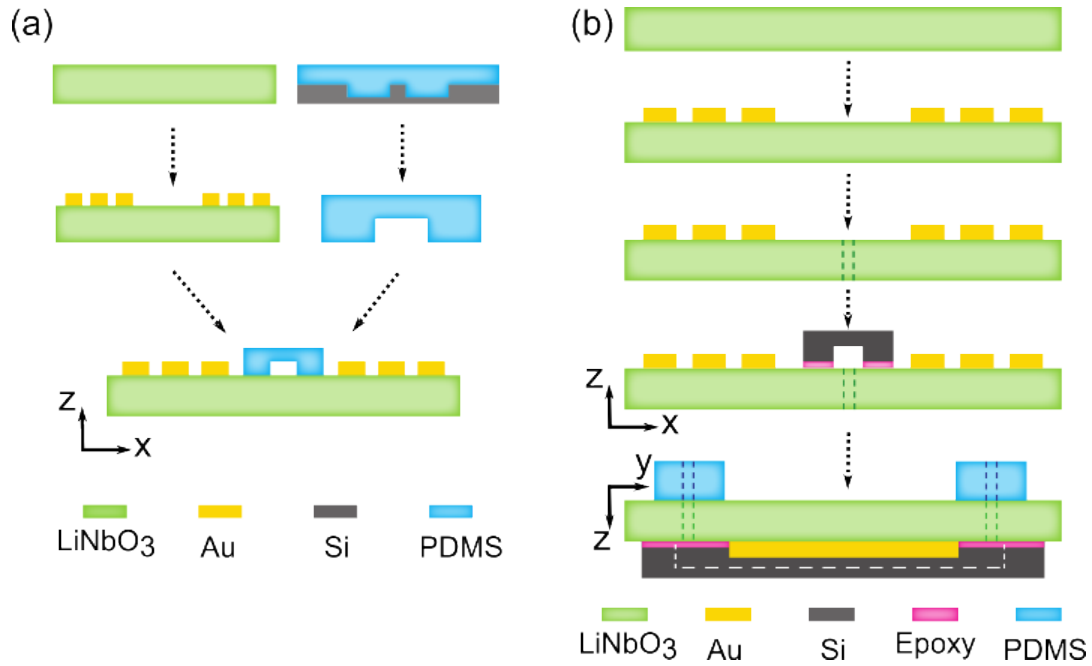


Fig. S1 Fabrication procedure of the SSAW microfluidic devices. (a) Fabrication of the device with PDMS channel. (b) Fabrication of the device with silicon channel.

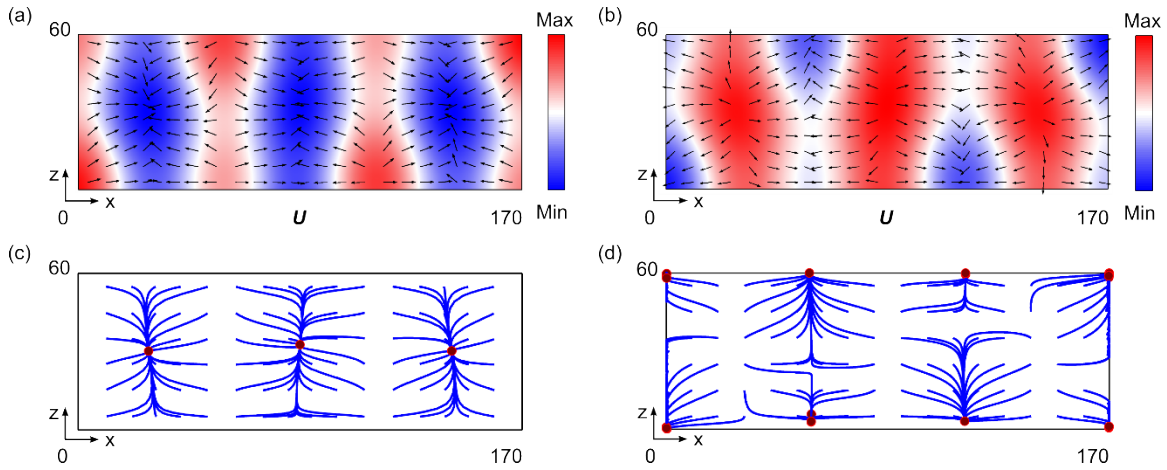


Fig. S2 Numerical results of acoustic energy potential, acoustic radiation forces, particle trajectories and final positions in silicon channel in width of 170  $\mu\text{m}$  when  $a_{AN}$  applied at the bottom. (a) Acoustic energy potential and acoustic radiation forces for polystyrene beads. (b) Acoustic energy potential and acoustic radiation forces for PDMS beads. (c) Trajectories and final positions of polystyrene beads, indicating three traces in x-y plane. (d) Trajectories and final positions of PDMS beads, indicating four traces in x-y plane. The unit for dimensions is  $\mu\text{m}$ . For the images of acoustic potential energy, red color indicate high energy while blue means low energy.

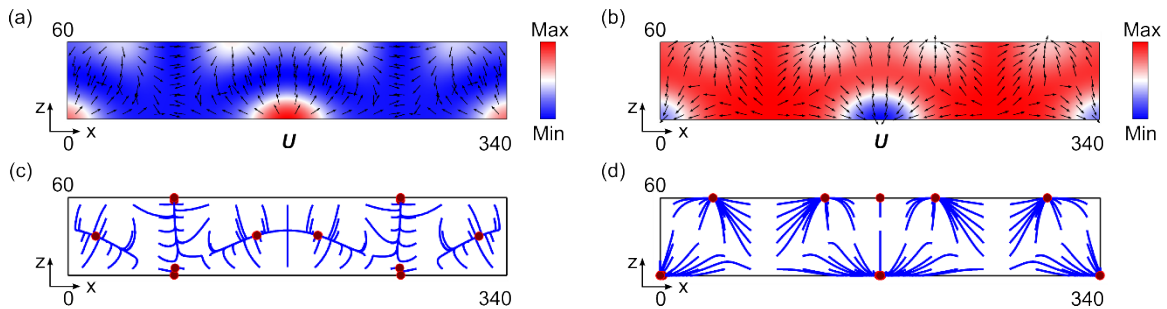


Fig. S3 Numerical results of acoustic energy potential, acoustic radiation forces, particle trajectories and final positions in silicon channel in width of 340  $\mu\text{m}$  when  $a_{AN}$  applied at the bottom. (a) Acoustic energy potential and acoustic radiation forces for polystyrene beads. (b) Acoustic energy potential and acoustic radiation forces for PDMS beads. (c) Trajectories and final positions of polystyrene beads, indicating six traces in x-y plane. (d) Trajectories and final positions of PDMS beads, indicating seven traces in x-y plane. The unit for dimensions is  $\mu\text{m}$ . For the images of acoustic potential energy, red color indicate high energy while blue means low energy.