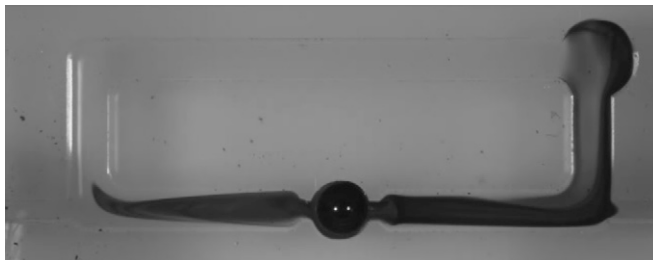


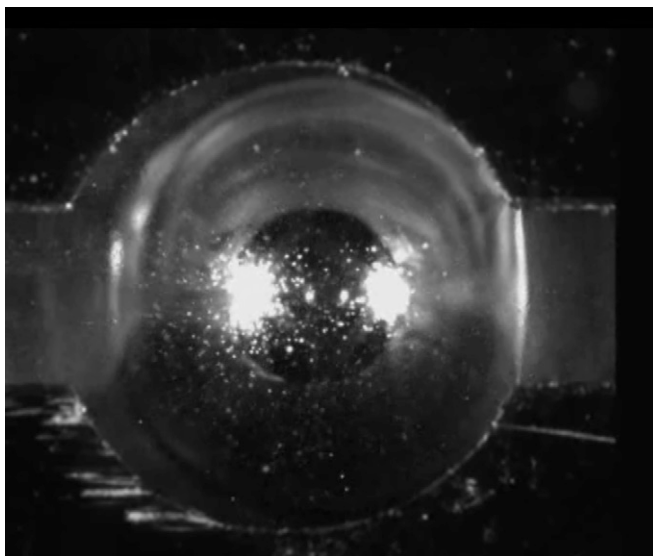
# Supporting Information

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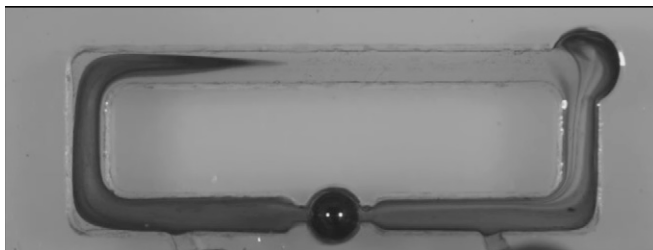
**Movie S1.** Continuous pumping effect obtained at 200-Hz and 5 V<sub>p-p</sub> square wave with 2.5-V DC offset.

[Movie S1](#)



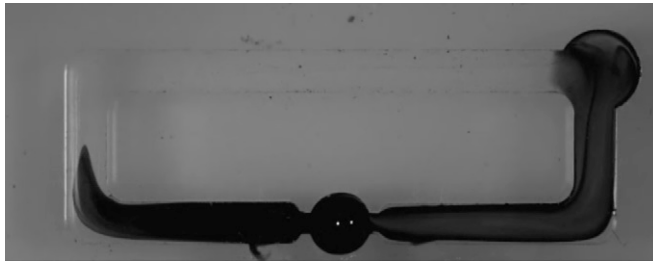
**Movie S2.** The trajectory of particles along the surface of the liquid metal droplet obtained by high-speed camera.

[Movie S2](#)



**Movie S3.** Decreasing the distance between the electrodes from 40 to 20 mm leads to a flow rate of 3600  $\mu\text{L}/\text{min}$ .

[Movie S3](#)



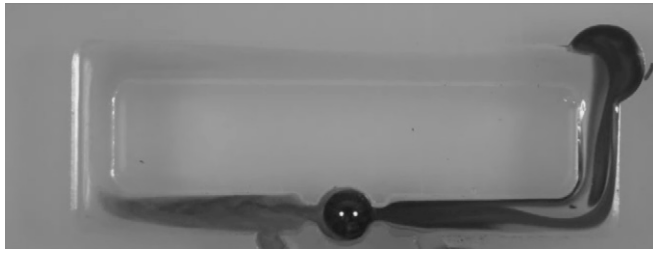
**Movie S4.** Decreasing the distance between the electrodes from 20 to 10 mm leads to a flow rate of 5400  $\mu\text{L}/\text{min}$ .

[Movie S4](#)



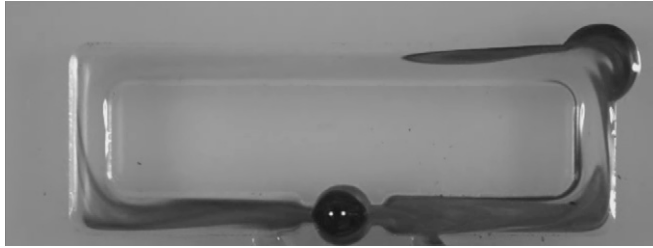
**Movie S5.** Increasing the length of the channel by 4× leads to the same flow rate of 5400  $\mu\text{L}/\text{min}$  under the same electrode gap and signal shown in [Movie S4](#).

[Movie S5](#)



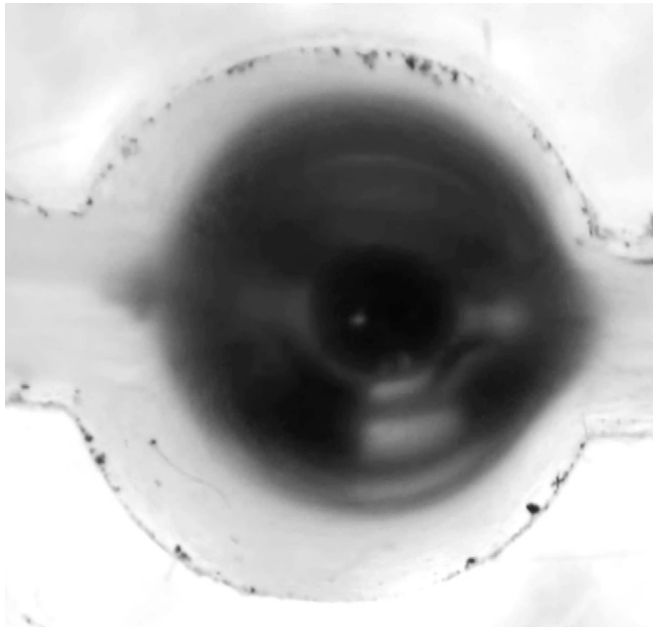
**Movie S6.** The flow can be stopped and started immediately by turning the voltage on and off.

[Movie S6](#)



**Movie S7.** The flow direction can be instantly reversed by changing the voltage polarity.

[Movie S7](#)



**Movie S8.** Pumping high-viscosity liquid in the presence of microparticles.

[Movie S8](#)

## Other Supporting Information Files

[SI Appendix \(PDF\)](#)