Electronic Supplementary Material (ESI) for Lab on a Chip

Supporting Information

Sorting and patterning of microbeads by evaporation driven receding meniscus.

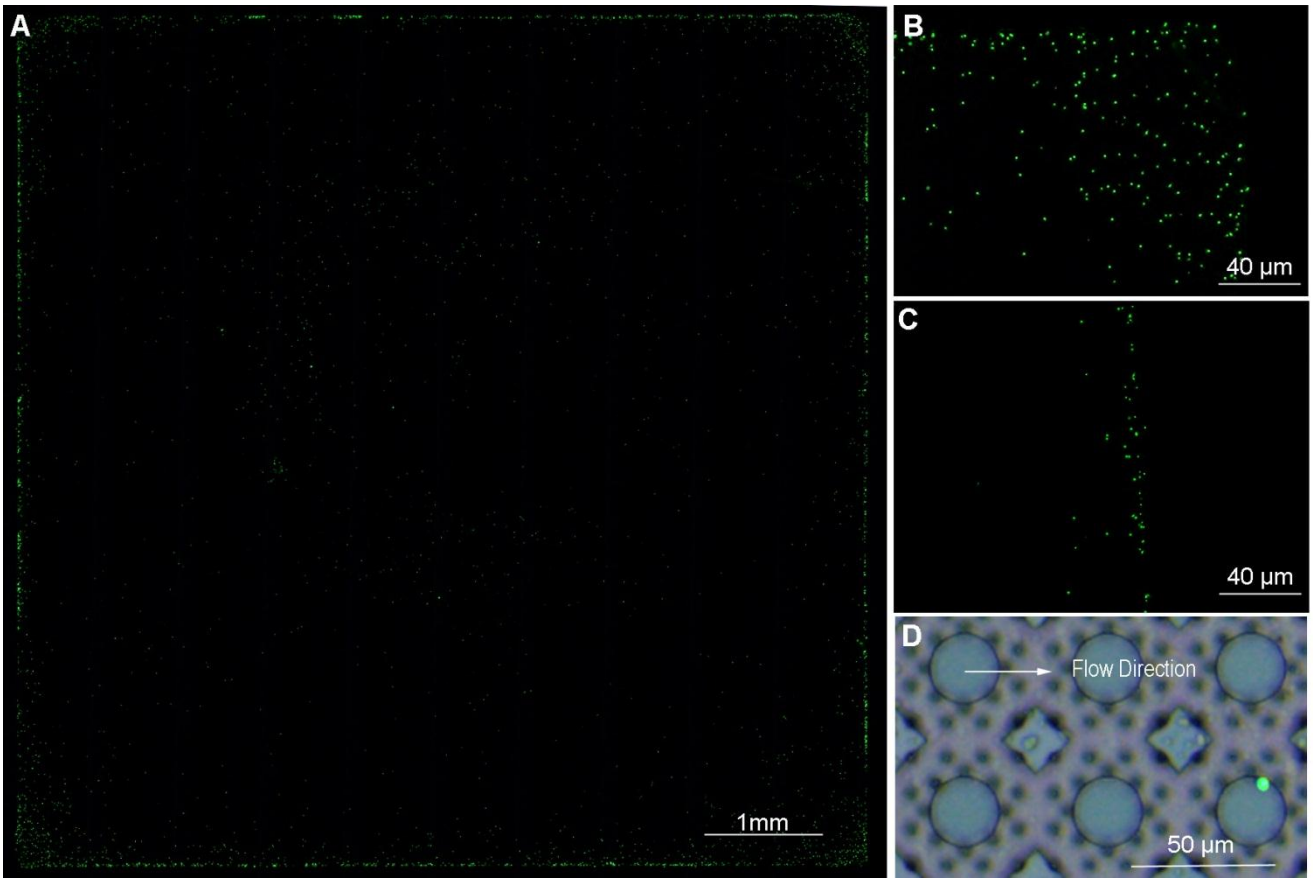

Fig S1. (A) Fluorescence image of a stitched 3D micro-traps array after evaporation driven sorting of 2µm diameter beads. >55% of the 20µm beads are found at the periphery of the chip after evaporation. Zoomed image of 2µm diameter beads (B) beads sorted to top right corner of the micro-traps array and (C) beads found at the periphery of the chip. (D) Optical image of a 2µm bead (Fluorescence green) trapped by a pillar in the stagnation point. Arrow denotes direction of surface tension driven flow beneath the micro-traps.

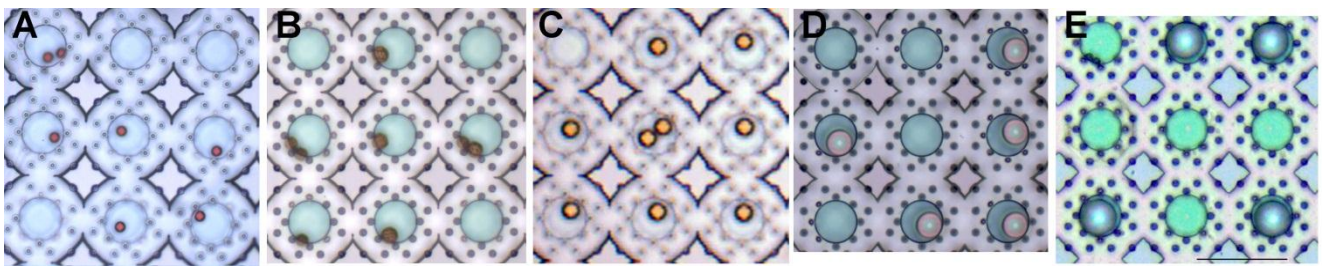

Fig. S2: Optical images of microbead patterned on a 3D micro-traps array; (A) 6µm diameter beads (red), (B) 8µm diameter beads, (C) 10µm diameter beads (orange), (D) 16µm diameter beads, and (E) 20µm diameter beads. Scale bar is 50µm for all 5 panels.

Sorting and patterning of microbeads by evaporation driven receding meniscus.

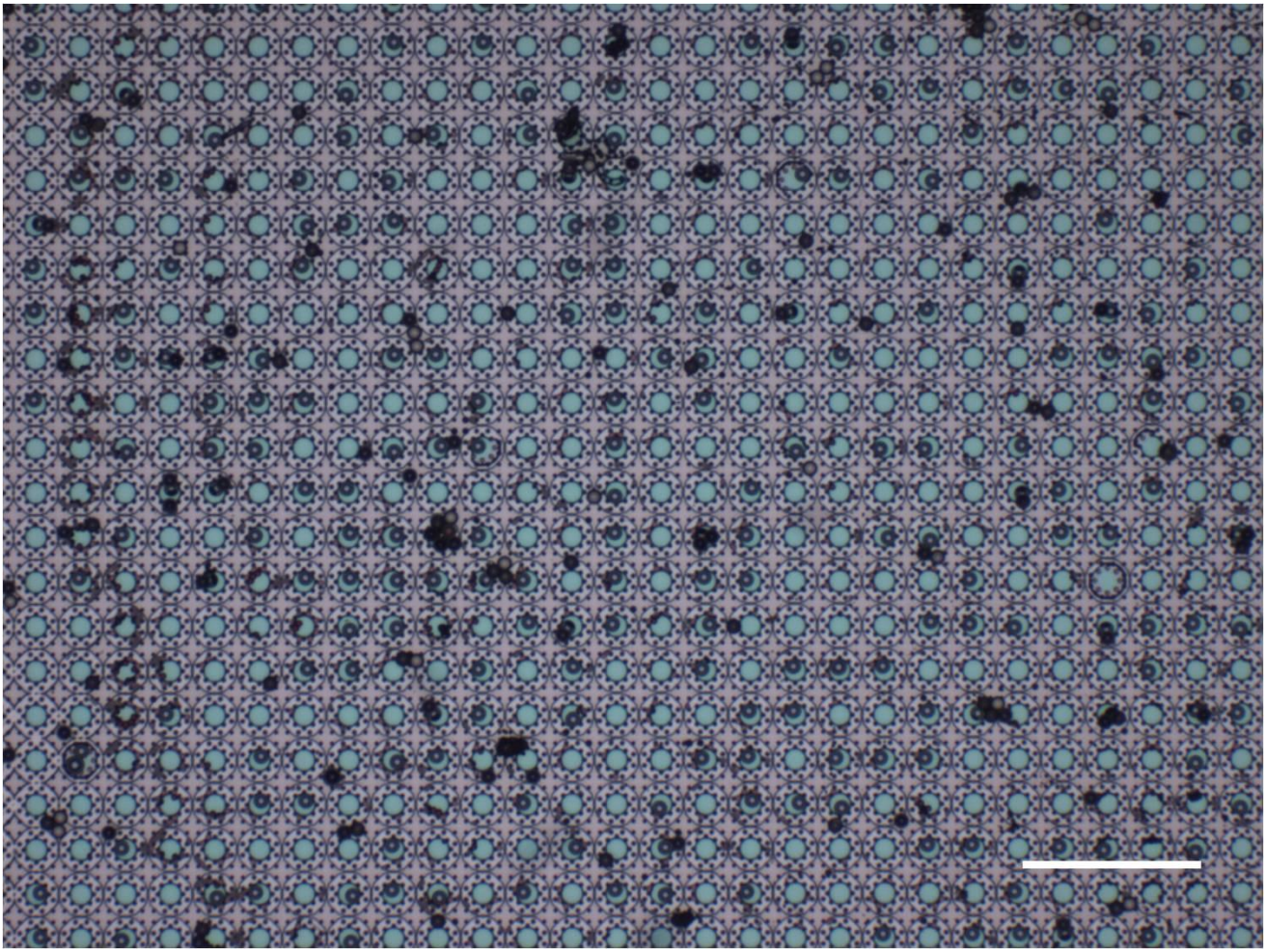

Fig. S3. Optical image of beads sorting and patterning on the field-of-view of 28×21 arrays. Among a population set of 16 μm diameter beads (n=309) seeded on the traps, 205 beads were patterned and trapped within the ordered arrays while 104 beads were found residing above the traps. The current evaporation approach achieved a patterning efficiency of >60%. The 6 μm diameter beads were found trapped within the pillars. Scale bar denotes a length of 200μm.

Table SI: Benchmarking technology for particle sorting

Sorting Techniques	Criteria					References
	Pumping	Interface	Sample volume <10µl	Particles cluster trapping	Single particle trapping	
Dielectrophoresis	Optional	Yes, Electrical source required	Yes	Medium	Yes	S1, S2
Optical	Optional	Yes, Laser source required	Yes	Low	Yes	S3, S4, S5
Acoustic	Optional	Yes, transducer activation required	No	High	Yes	S6, S7, S8, S9
Hydrodynamic	Yes	Yes Pressure source	No	Medium	Yes	S10, S11
Magnetic	Not required	Yes, magnet required	Yes	High	No	S12, S13
Our technique	Not required	No	Yes 2-10 µl	High	No	

*Optional- researchers have used the respective technique with or without a pump

Additional References:

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