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Supplementary Material for:

A low cost and quasi-commercial polymer film chip for high-throughput inertial cell isolation

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Supplementary data

Table S1. Comparison of various rapid prototyping methods for fabricating microfluidic devices.

Fabrication methods	Materials	Design-to-device time	Advantages	Disadvantages
Soft lithography	PDMS	~ 24 h	Complex topography replication, high resolution	Require clean room facility, need skilled technician, need master mold
Roll-to-roll embossing	Polymers	Several hours (mainly due to the fabrication time of master molds)	Continuous replication	Need master mold
Injection molding	Polymers, metals	Several hours (mainly due to the fabrication time of master molds)	Mass production capability	Need master mold
CNC machining	Polymers, glass, metals	~ 30 min	Flexible structure optimization	Rough surface, not suitable for mass production
Xurography	Soft polymers	~ 30 min	Flexible structure optimization	Rough surface, not suitable for mass production
3D printing	Thermoplastics (PLA)	> 1 h	Flexible structure optimization	Low resolution, limited materials, not suitable for mass production
Our work	Polymers	< 20 min	Flexible structure optimization, batch production capability	Architecture limitation

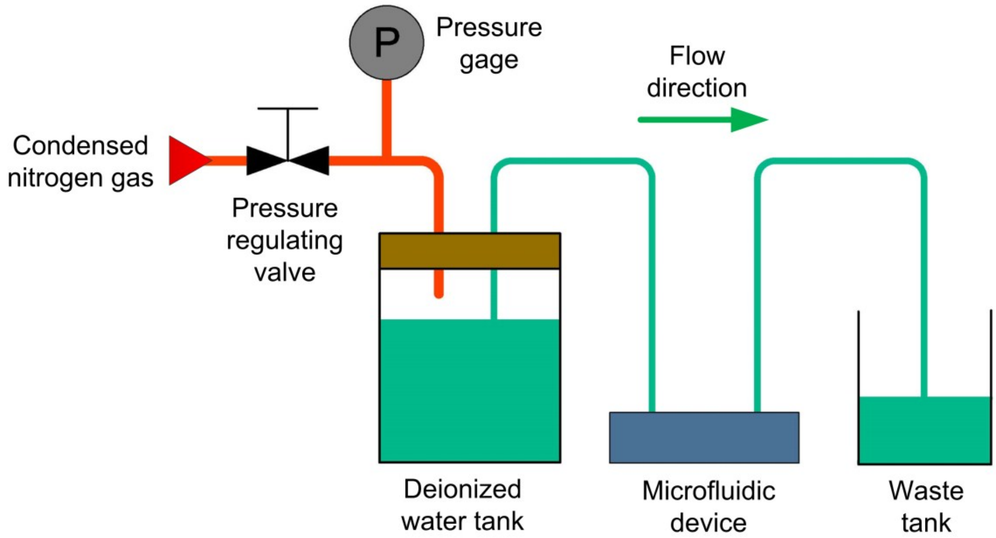

Fig. S1 Schematic diagram illustrating experimental setup for bond strength test of microfluidic devices.

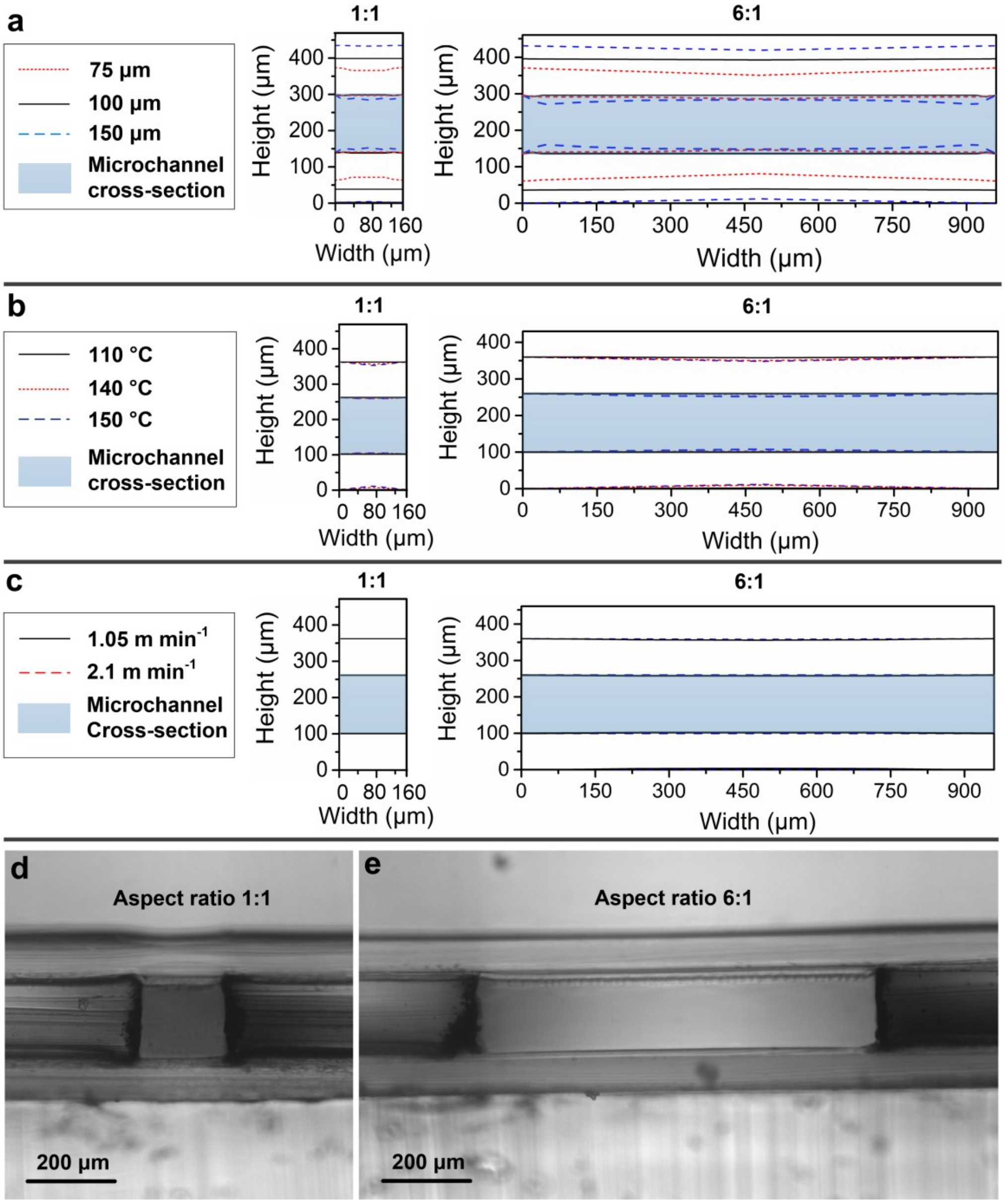

Fig. S2 Cross-sectional features of channels with aspect ratios of 1:1 and 6:1. (a) Comparisons of cross-sectional features under different laminating films; (b) Comparisons of cross-sectional features under different roller temperatures; (c) Comparison of cross-sectional features under different rolling speeds; (d-e) Captured cross-sectional image of channels with aspect ratios of 1:1 (d) and 6:1 (e) under the laminating process of using 100 µm thick laminating films, at a roller temperature of 120 °C and a rolling speed of 1.6 m min^{-1}.

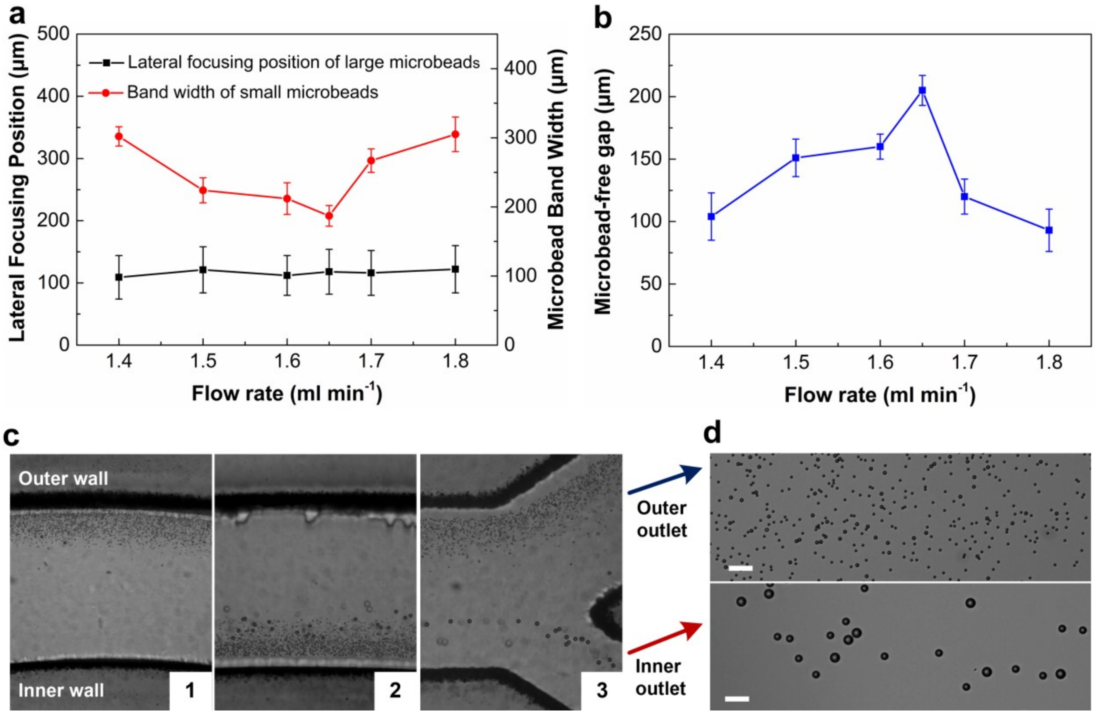

Fig. S3 Performance of microbead inertial isolation in our integrated device. (a) Quantitative analysis of lateral focusing position of large microbeads and band width of small microbeads versus total Dean flow rate; (b) Quantitative analysis of the gap between the large and small microbeads versus total Dean flow rate; (c) Composite images illustrating microbead dynamics at different positions (see the number marks in Fig. 5b) along the spiral channel under the optimal isolation flow rate; (d) Microscopic images illustrating collected samples from outer outlet and inner outlet.