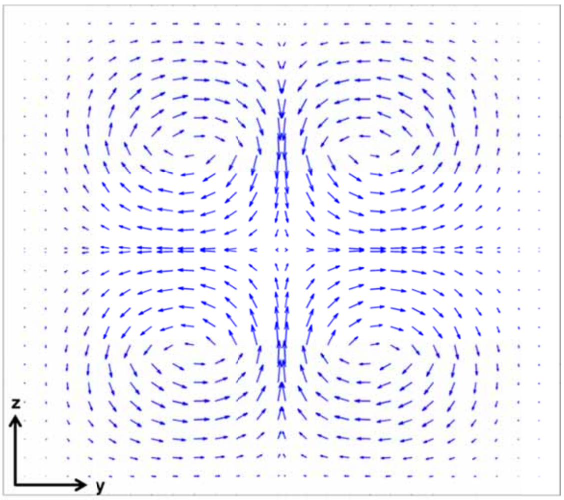
Electronic Supplementary Material (ESI) for Lab on a Chip

Electronic Supplementary Information

Design and fabrication of uniquely shaped thiol–ene microfibers using a two-stage hydrodynamic focusing design

Darryl A. Boyd,[a] Adam R. Shields,[a] Peter B. Howell Jr.,[b] and Frances S. Ligler[b]*

[a]National Research Council, Research Associateship Programs, Washington, DC 20001
[b]Naval Research Laboratory, Washington, DC 20375
*E-mail for correspondence: frances.ligler@nrl.navy.mil



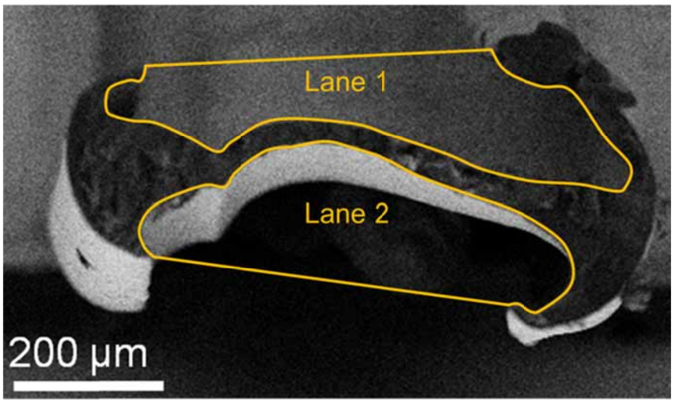
ESI Figure 1. The average velocity profile of the core fluid as its cross-section profile is manipulated by the channels chevron grooves. The profile is visualized end-on such that the z-direction indicates the ceiling and floor of the channel, and the y-direction points toward the side walls of the channel.

Insert ESI Figure 2 video here.

ESI Figure 2. Comparison of confocal core shaping experiment (left) versus the COMSOL core shaping simulation (right). The comparison represents end-on cross section slices of the core as the fluid travels from the beginning of the channel (prior to the chevron grooves) through the 10 chevron grooves, and ending just prior to the 2nd sheathing region.

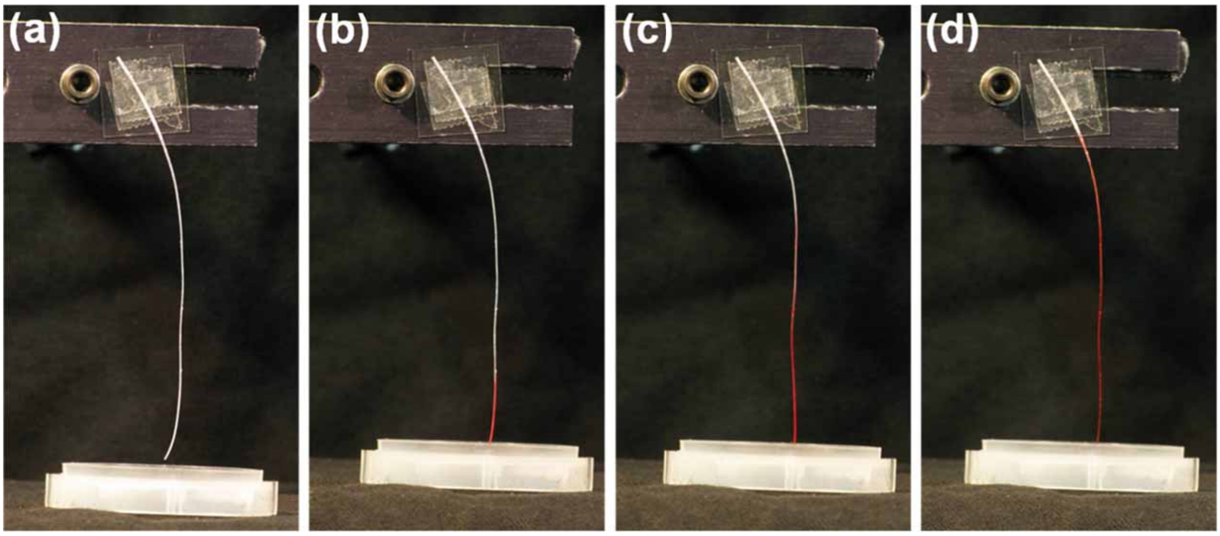
Insert ESI Figure 3 video here.

ESI Figure 3. Comparison of confocal core shaping experiment (left) versus the COMSOL core shaping simulation (right). The comparison represents end-on cross section slices of the core as the fluid enters the 2nd sheathing region of the microfluidic channel, followed by the miniaturization of the core material.



ESI Figure 4. Cross section image of a thiol–ene double anchor fiber showing the "negative cross-section" areas of the fiber (lanes 1 and 2).

The double anchor shape of the fibers resulted in the formation of four troughs, which created two lanes that ran the length of the fibers. The fibers demonstrated the ability to vertically transport fluids via these lanes. The above cross-section image highlights the approximate area where fluids can be transported in the lanes, between the troughs of each lane.



ESI Figure 5. Photographs of red dye wicking up suspended double anchor fibers. (a) Double anchor shaped thiol–ene fiber prior to immersion of the tip into a red dye. (b)-(d) Still frames of a double anchor fiber vertically transporting red dye. .