Supporting Information

Printable asymmetrical surface pattern for responsive directional liquid transport

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This PDF file includes:

Figures S1 to S12

Legends for Movies S1 to S3

Other Supplementary Materials for this manuscript include the following:

Movies S1 to S3

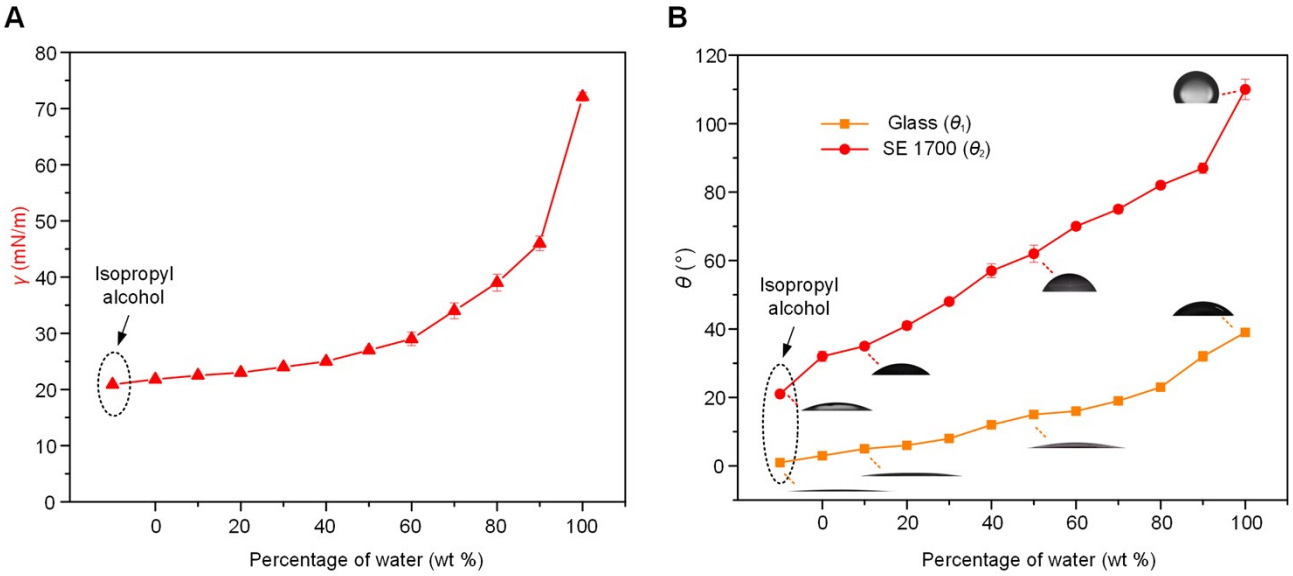

Fig S1. (A) Surface tension of isopropyl alcohol and water-ethanol mixtures with varied mass fraction. (B) Contact angles of isopropyl alcohol and water-ethanol mixtures on glass substrate and SE1700 silicone, respectively.

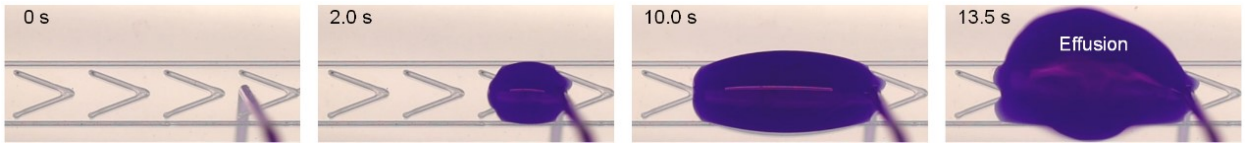

Fig S2. Transport behavior of ethanol with 80 wt% water on asymmetrical patterned surface.

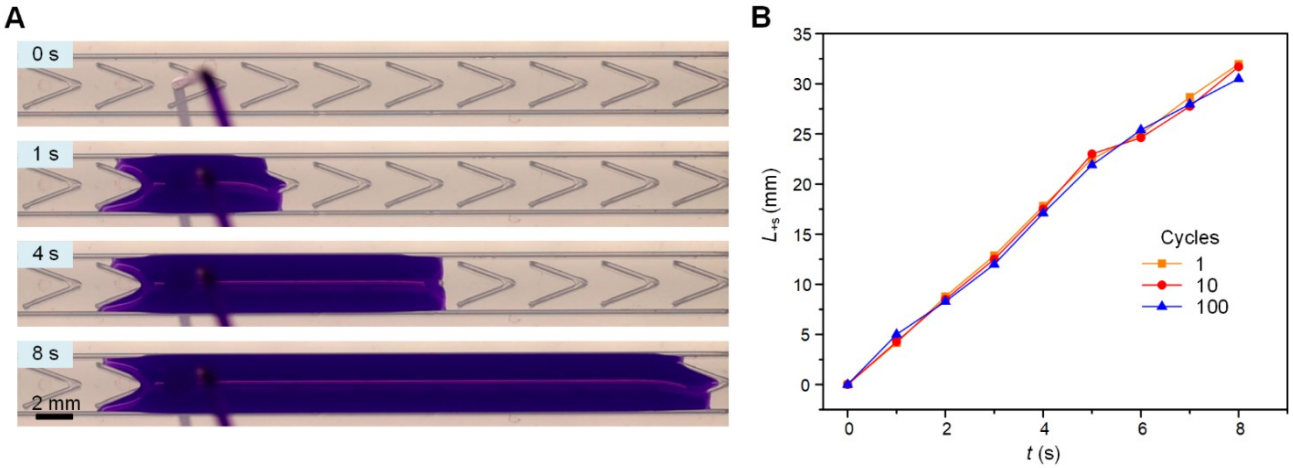

Fig S3. (A) The unidirectional liquid transport behavior on the asymmetric functional surface after 100 repetitive experiments. (B) Durability test of the asymmetric functional surface.

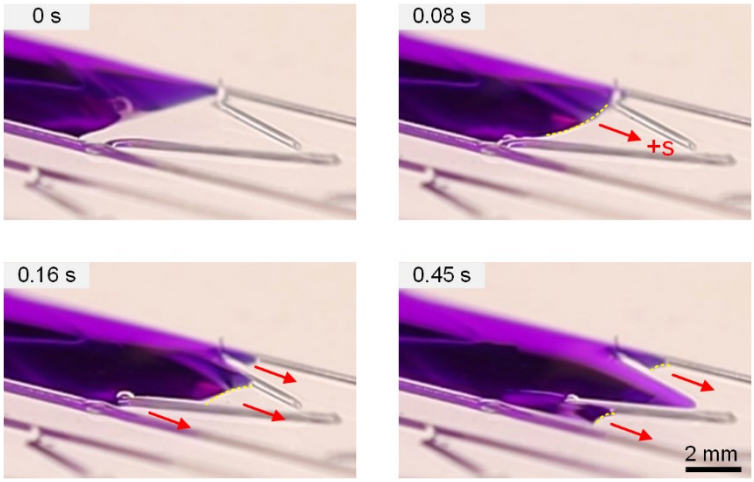

Fig S4. Detailed time-lapsed images of the unidirectional transport process of liquid (ethanol containing 10 wt% water) on the surface.

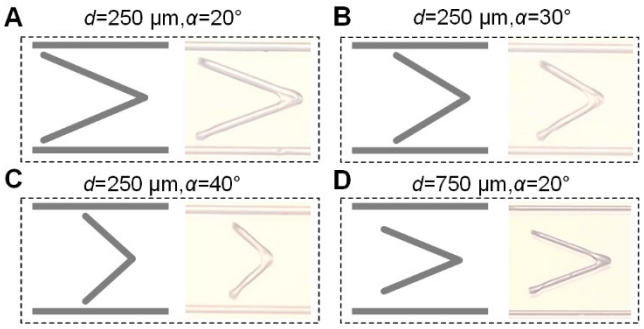

Fig S5. Different geometric parameters design of the V patterns.

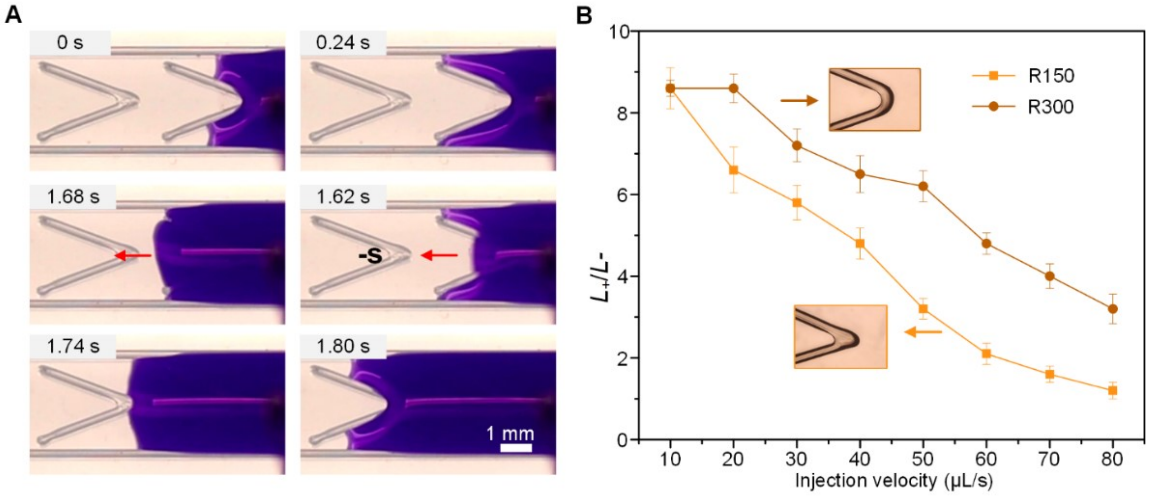

Fig S6. (A) Time-sequence images of liquid effusion from vertex of V-letters in -s direction due to Laplace pressure of concave liquid transport front. (B) Influence of vertex radius on liquid transport distance ratio (L_{+s}/L_{-s}). Liquid: ethanol containing 10 wt% water.

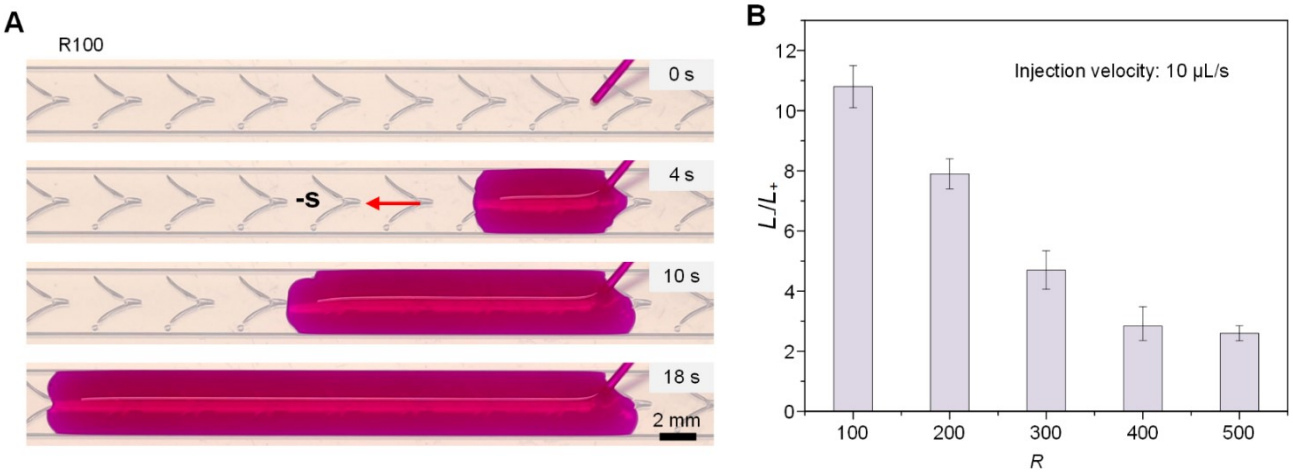

Fig S7. (A) Effect of small vertex radius R of V letters on directional liquid transport in -s direction. (B) Influence of vertex radius R on liquid transport distance ratio (L_{+s}/L_{-s}). Liquid: ethanol containing 50 wt% water.

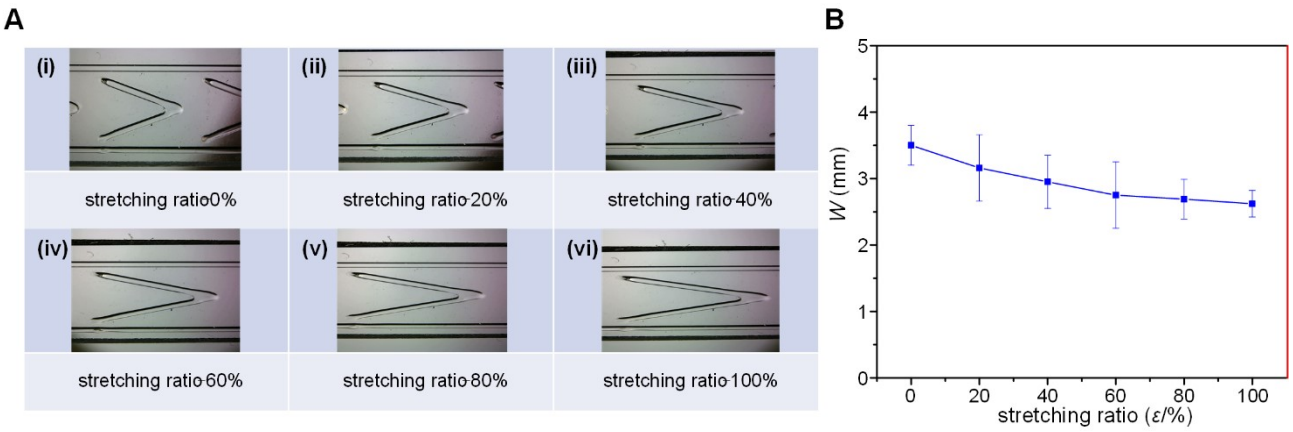

Fig S8. (A) Surface morphology after stretching. (B) Variations of channel width *W* against the stretching ratio.

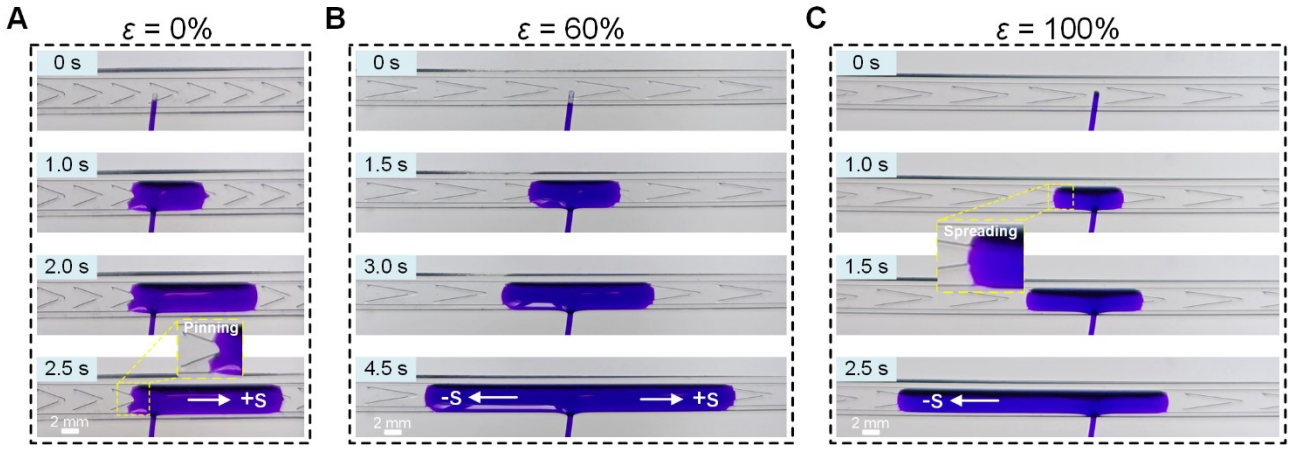

Fig S9. The liquid transport state at a surface stretching ratio of (A) 0 %, (B) 60 % and (C)100 %.

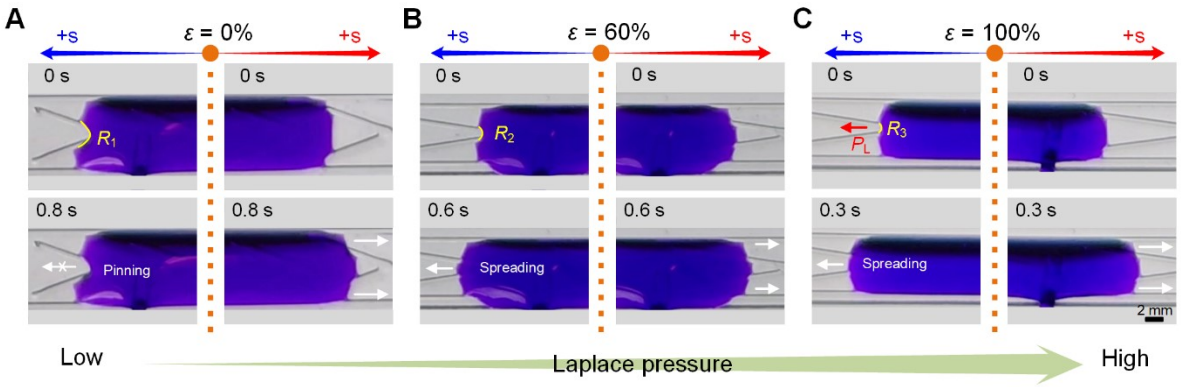

Fig S10. The morphology of liquid precursor in +s and –s direction with different surface stretching

ratio of (A) 0 %, (B) 60 % and (C)100 %.

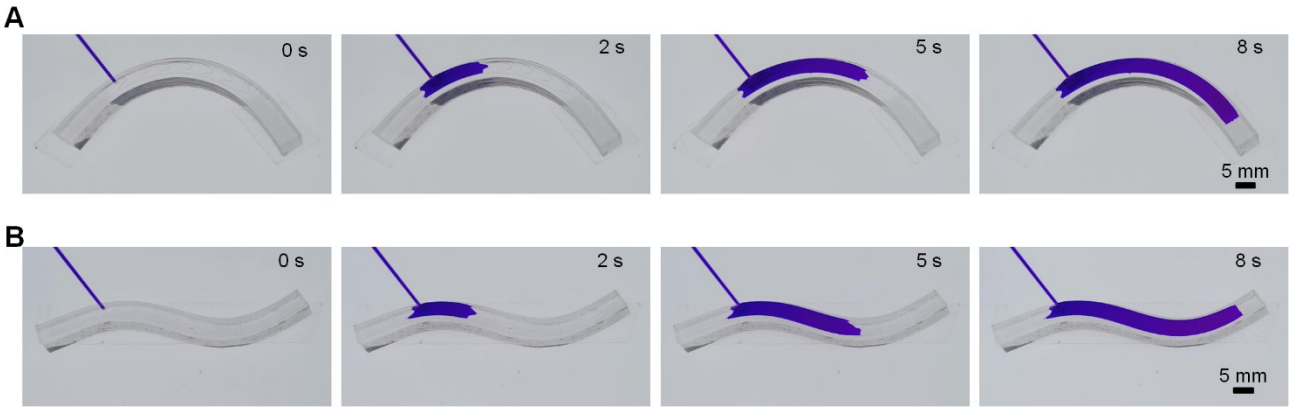

Fig S11. Directional liquid transport on soft patterned surfaces after bending.

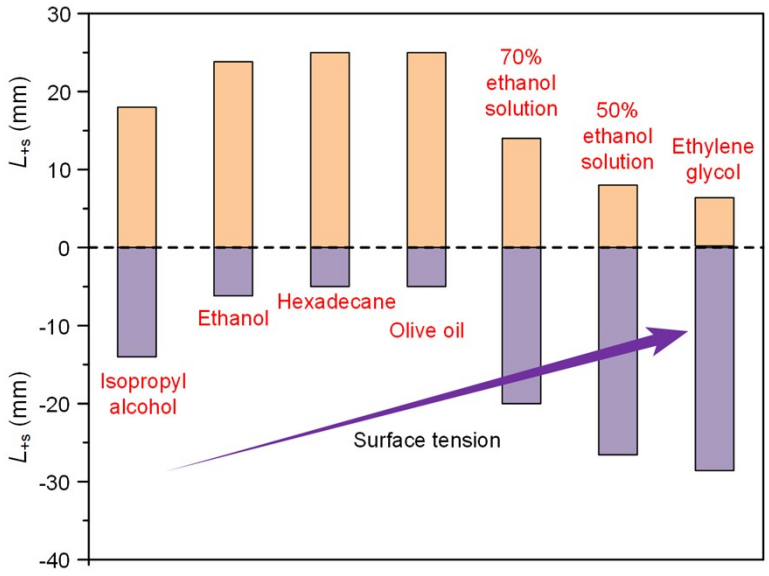

Fig S12. Liquid transport distance ratio (L_{+s}/L_{-s}) for different liquids.

Supplementary Movies

Supplementary Movie 1. Three liquid transport modes based on the surface tension of liquids.

Supplementary Movie 2. Strain responsiveness of directional liquid transport.

Supplementary Movie 3. Isolation of liquids with different surface tension.