Supporting information

1. The typical ratio of volumetric flow rates of the jet phase to the continuous phase Q_{in}/Q_{out} for forming folded jets is no less than 0.05(See black square symbols in figure S1.), and the velocity of the jet phase is higher than that of the outer continuous phase, $u_{in} > u_{out}$. At sufficiently high Q_{out}, the folded jet can be straightened by the viscous force exerted by the continuous phase, as shown by the red circular symbols in figure S1.

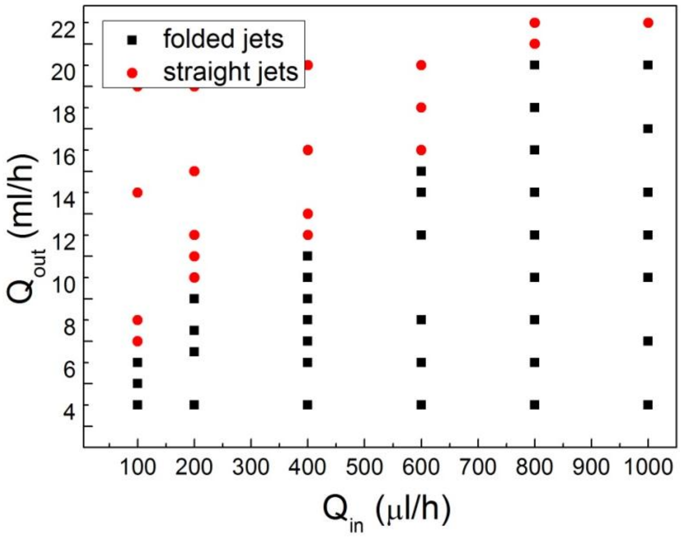

Figure S1: State diagram of the jet phase as a function of the flow rates. The square symbols represent the flow conditions in which a folded jet forms; the red circular symbols represent the flow conditions in which a straight jet forms. The jet phase is a mixture of 10 wt% dextran and 10 wt% dextran sulfate solution, and the continuous phase is 13 wt% PEG solution.

2 The jet of 10 % dextran solution decreases in diameter when the flow rate of the continuous phase increases, as shown by square symbols in figure S2. Specifically, when the flow rate of the continuous phase increases from 2000 µl/h to 15000 µl/h, the jet diameter decreases from 284 µm to 77 µm, reflecting a reduction of 73%. By comparison, when a jet of a mixture of 10% dextran and 10% dextran sulfate solutions is injected as the jet phase, and the resultant jet diameter decreases 78µm to 75µm (red dots in figure S2), less than 5% reduction. This comparison highlights the difficulty of changing the diameter of the viscous jet by changing Q_{out} alone.

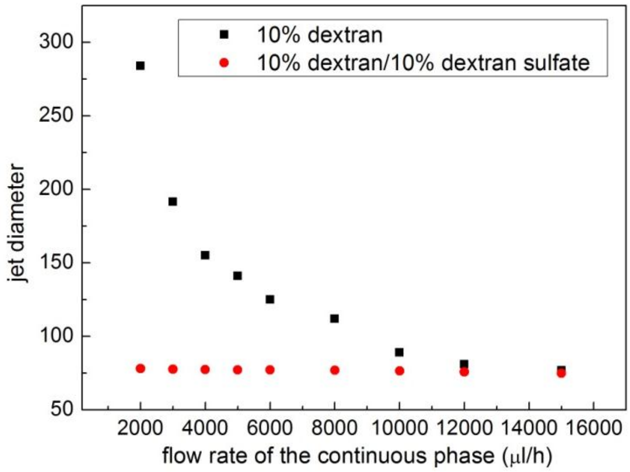

Figure S2: A plot of the jet diameter as a function of the flow rate of the continuous phase Q_{out}. The jet phase is 10% dextran solution, and the continuous phase is 13% PEG solution. In the plot, Q_{in}=200 μl/h.

3. Above a certain critical voltage U_c*, a straight jet forms, rather than a folded one. The value of U_c* depends on the flow rate of the jet phase, as shown by the square symbols in figure S3. When the flow rate of the jet phase Q_{in} increases from 100 μl/h to 1000 μl/h while fixing the flow rate of the continuous phase at 5000 μl/h, the resultant U_c* increases from 15V to 48V. At a higher flow rate of the jet phase, a larger increase in the jet diameter is needed to achieve a straight jet due to mass conversation. As a result, the corresponding critical voltage Uc* is required.

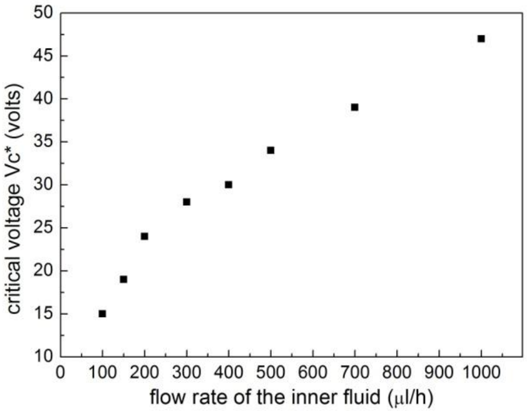

Figure S3: A plot of the critical voltage for complete unfolding of the viscous jet as a function of the flow rate of the jet phase. The jet phase is a aqueous mixture of 10% dextran and 10% dextran sulfate solutions, and the continuous phase is a 13 wt% PEG solution. In the plot, the flow rate of the continuous phase Q_{out} is fixed at 5000 μl/h.