Rapid and Continuous Cryopreservation of Stem Cells with a 3D Micromixer

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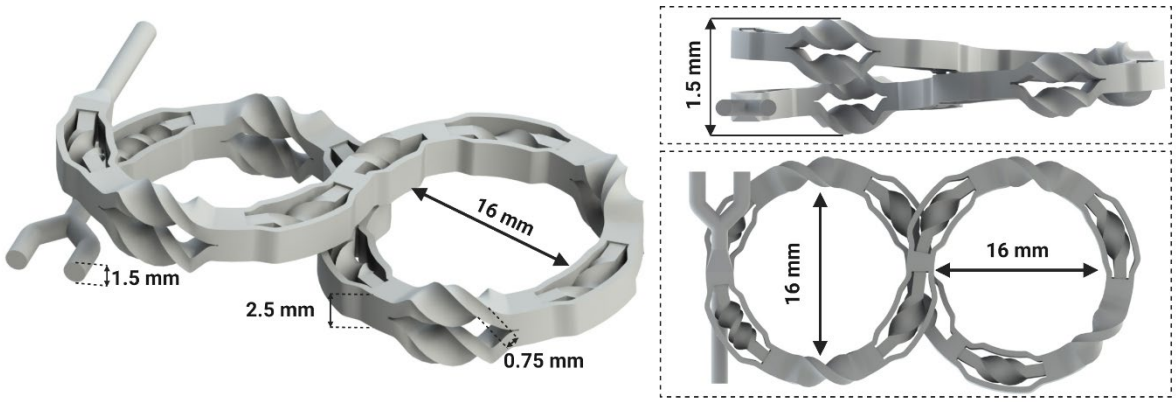

Figure S1. The design and dimension of the micromixer. Mixing units used in the proposed design each has unique geometry and functionality, hence flow characteristic.

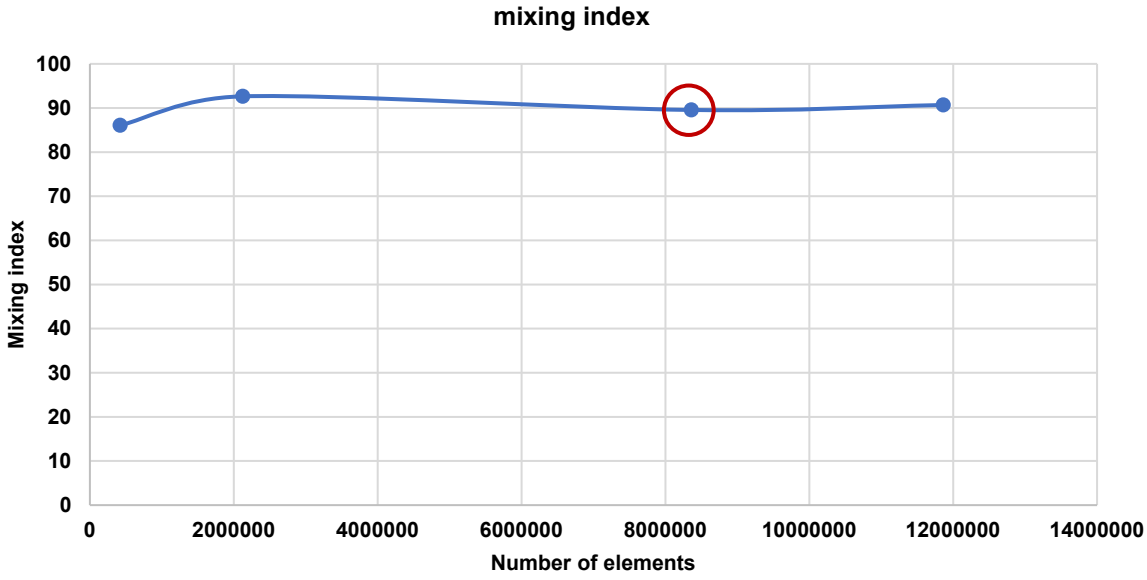

Figure S2 Grid independence test for simulating the micromixers.

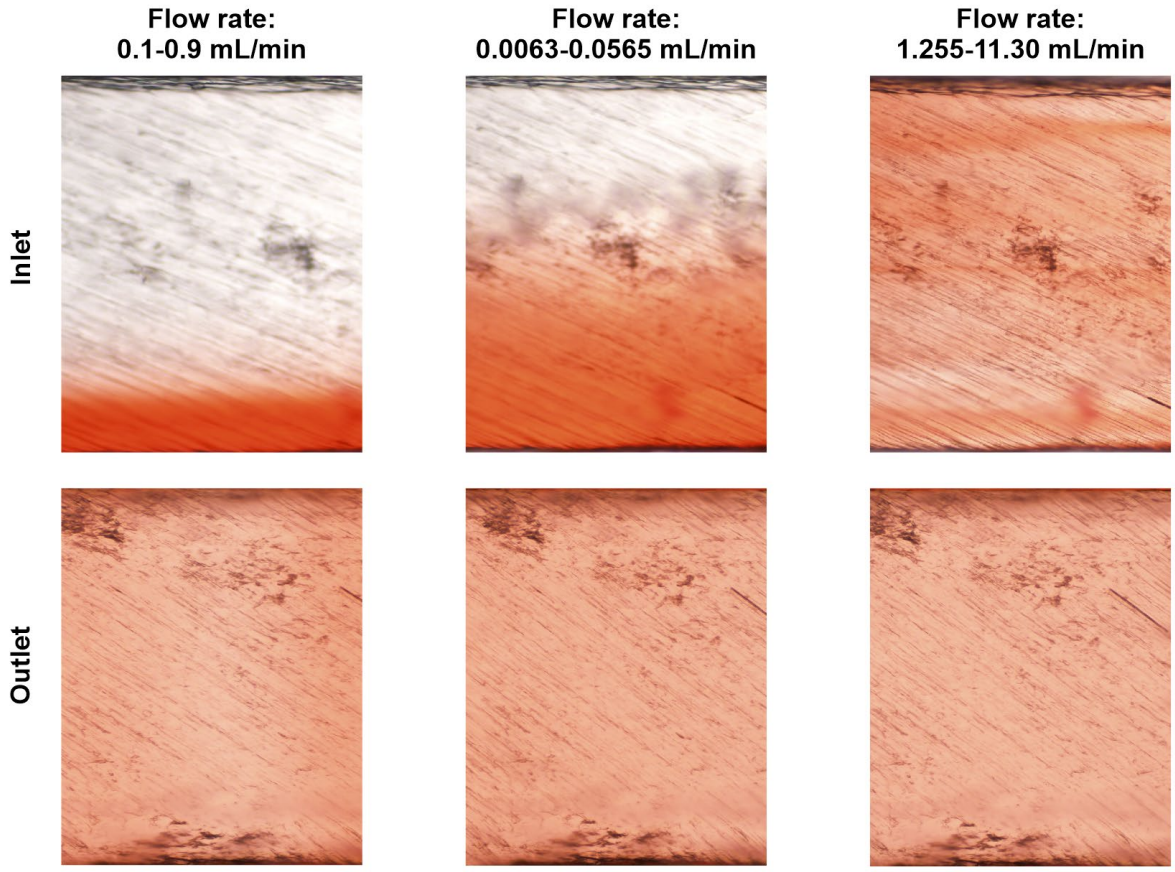

Figure S3 The results of food dye mixing with DI water characterise the mixing efficiency of micromixer in real case. The figures of the outlet showed homogenous mixing of food dye across different flow rates.

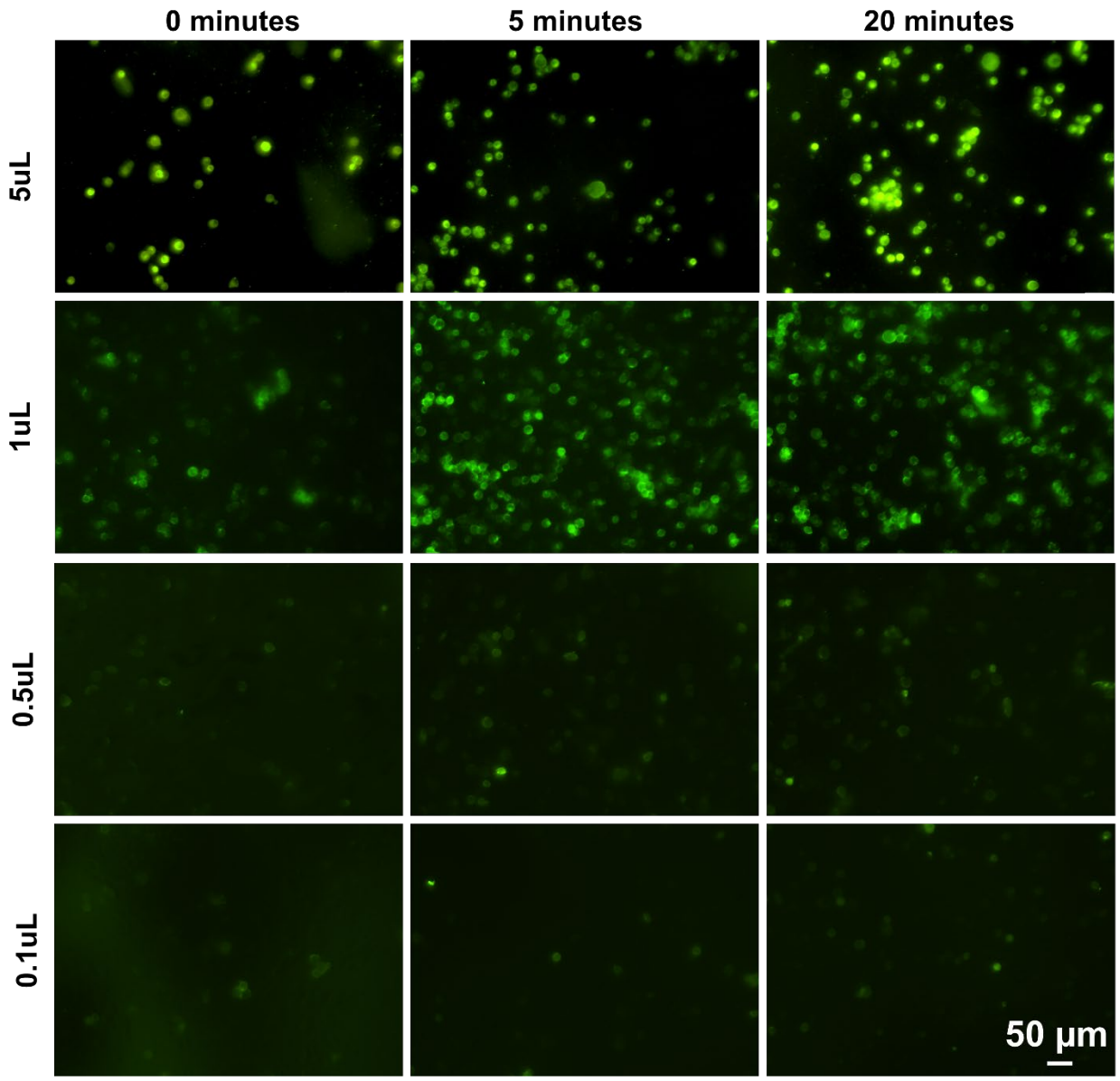

Figure S4. Characterisation of cytoplasmic dye concentration before using it for mixing experiment. The results showed that above 1 µL/million cells/mL, the cells are overstained from 0 minutes. Therefore 0.5 µL/million cells/mL was used to characterise the micromixer.

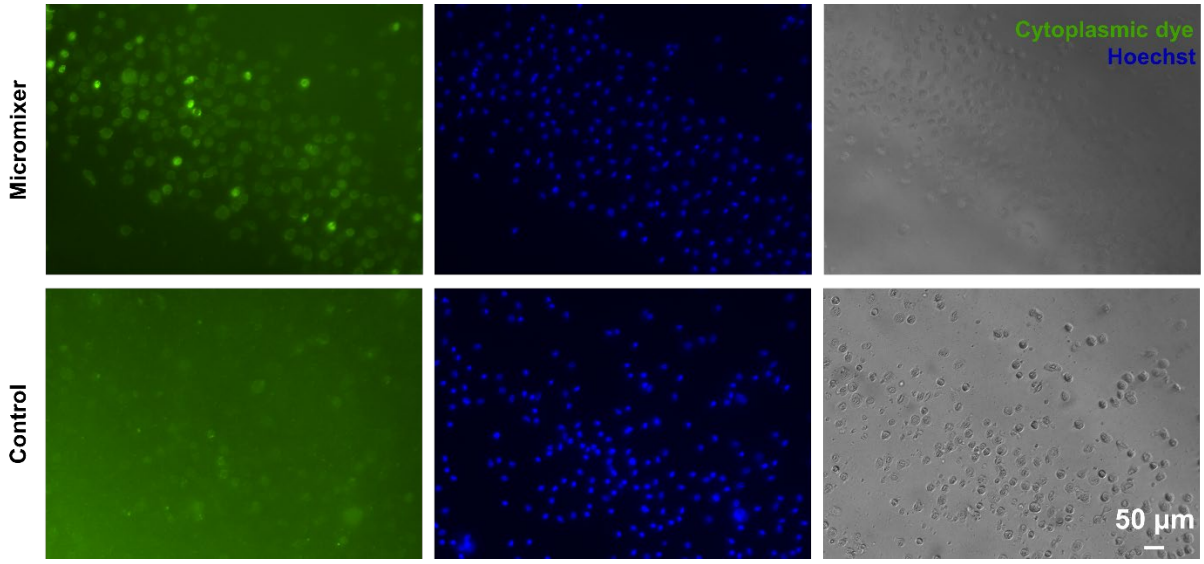

Figure S5 The micromixer mixing group and manual mixing group control cells after 15 minutes of staining. Results showed that most of the cells in micromixer groups are stained by both Hoechst and Cyotoplasmic dye, while many cells in the manual control groups are not stained with cytoplasmic dye.