Electronic Supplementary Material (ESI) for Lab on a Chip.


# Supplementary Information

**Continuous Microfluidic Fabrication of Anisotropic Microparticles for Enhanced Wastewater Purification**

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**Keywords:** anisotropic microparticles, tailored shapes, oil-droplets-filled microfibers, wastewater purification, microfluidics

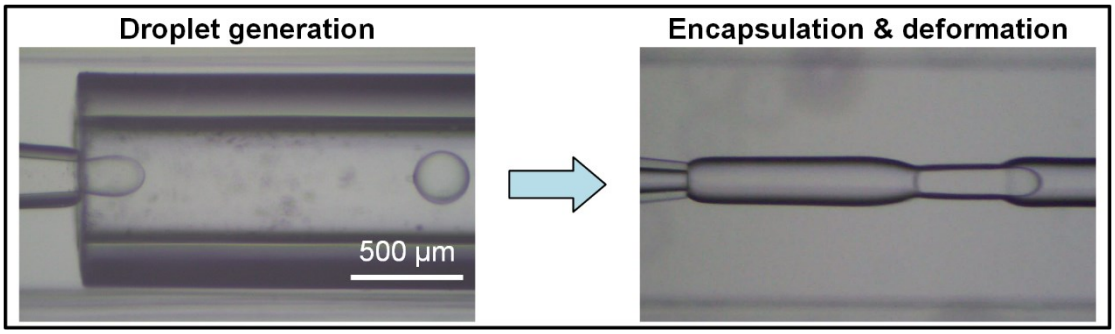


**Figure S1** Optical images showing the fabrication of monodisperse oil-droplet precursors (left) and the encapsulation of deformed oil-droplet templates into microfiber (right).

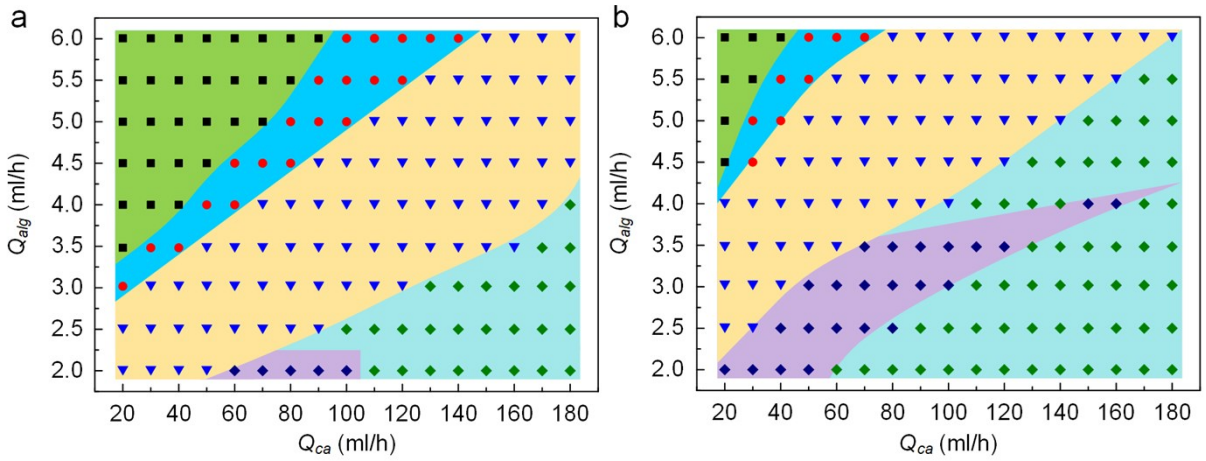


**Figure S2** (a) Phase diagram for various shapes of oil-encapsulants within microfiber under different flow rates of middle alginate ($Q_{alg}$) and outer calcium chloride ($Q_{ca}$) phases, while the flow rate of inner oil phase ($Q_{oil}$) is fixed at 50 μl $h^{-1}$. (b) Phase diagram for various shapes of oil-encapsulants within microfiber under different flow rates of $Q_{alg}$ and $Q_{ca}$, while $Q_{oil}$ is fixed at 200 μl $h^{-1}$. The viscosity of oil phase is 0.431 Pa·s.

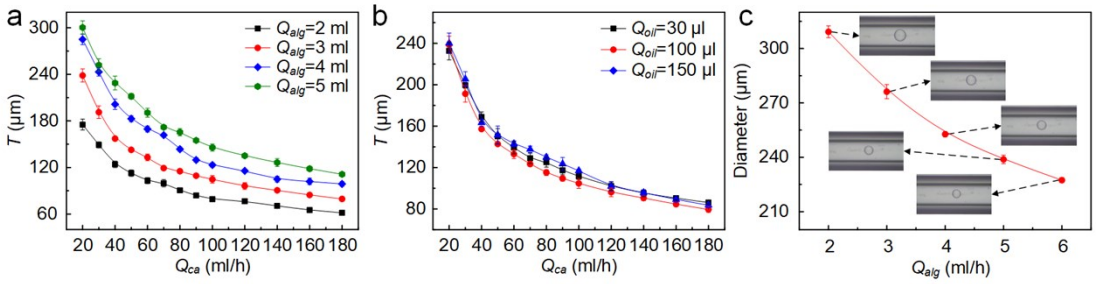


**Figure S3** (a) The relationship between the thickness of microfiber and $Q_{ca}$ under different $Q_{alg}$, the $Q_{oil}$ is fixed at 100 μl $h^{-1}$. (b) The relationship between the thickness of microfiber and $Q_{ca}$ under different $Q_{oil}$, the $Q_{alg}$ is fixed at 3 ml $h^{-1}$. (c) The relationship between the diameter of oil-droplet precursors and $Q_{alg}$ under fixed $Q_{ca}$:40 ml $h^{-1}$ and $Q_{oil}$: 100 μl $h^{-1}$.

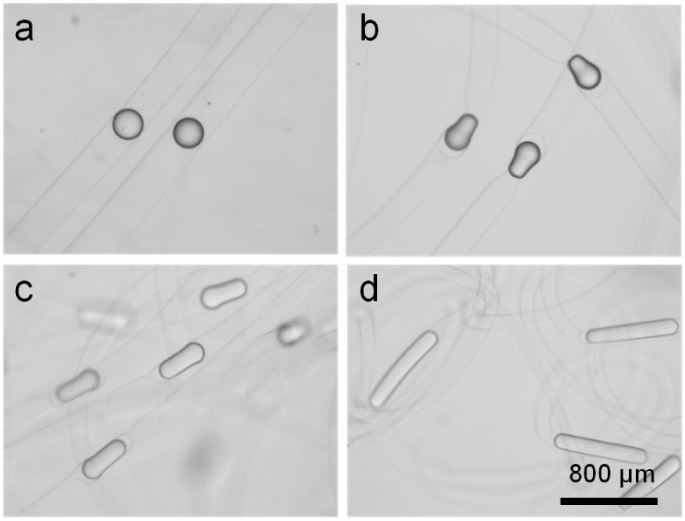


**Figure S4** (a-d) Optical micrographs of four different kinds of oil-droplet templates within microfibers: (a) spherical shape (b) pear-like shape (c) maraca -like shape and (d) rod-like shape.

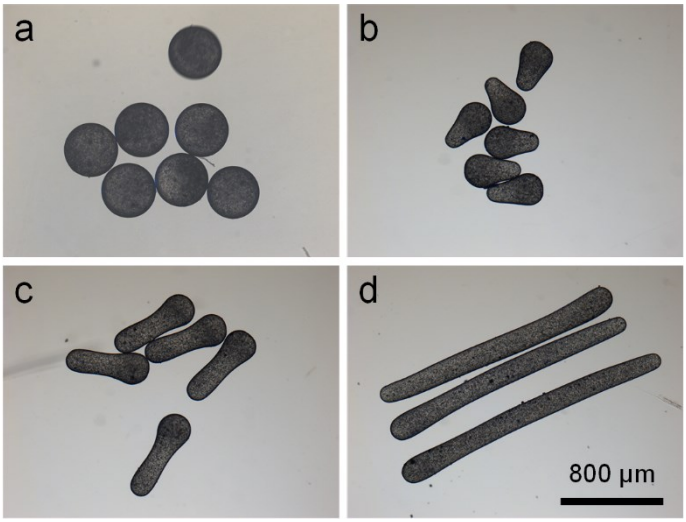


**Figure S5** (a-d) Optical micrographs of magnetic PDMS microparticles with their shapes ranging from (a) sphere to (b) pear-like, (c) maraca-like and (d) rod-like.

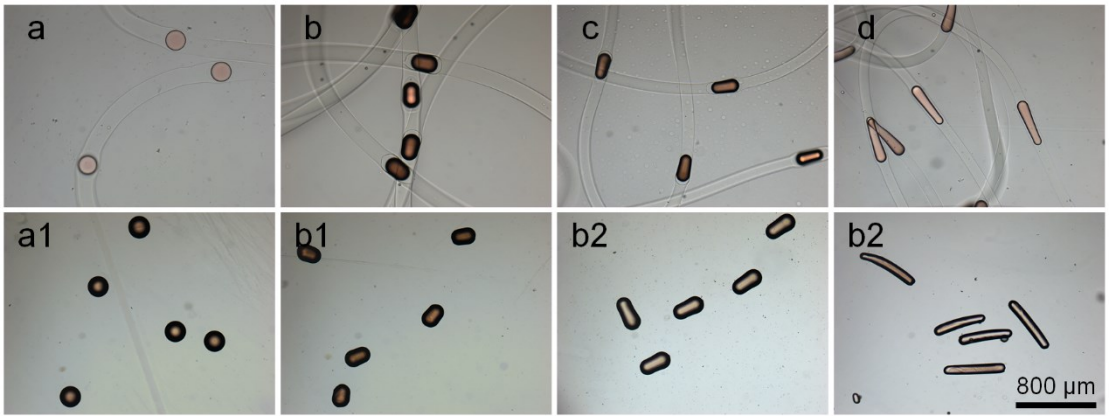


**Figure S6** (a-d) Optical micrographs of ETPTA-droplet templates within microfiber and (a1-d1) their corresponding solidified microparticles with shapes changing from (a,a1) sphere to (b,b1) ellipsoid, (c,c1) maraca-like and (d,d1) rod-like, where the oil-droplet templates are dyed with oil red O.

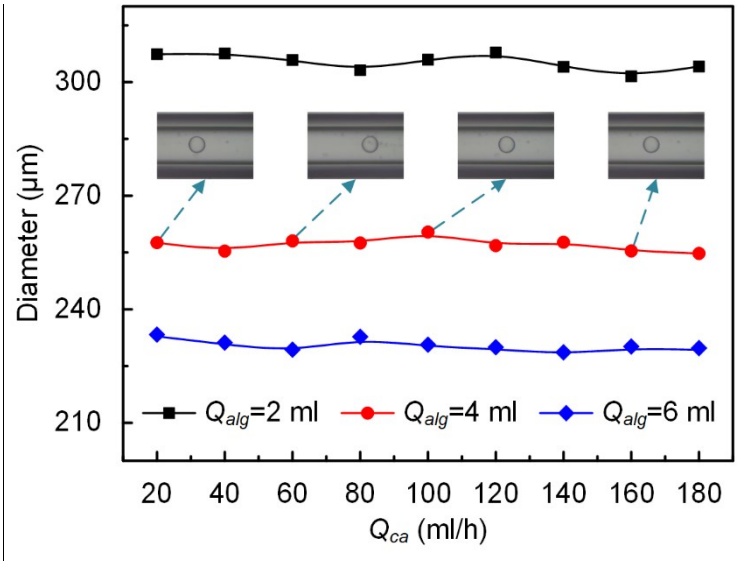


**Figure S7** The relationship between the diameter of oil-droplet precursors and $Q_{ca}$ under different $Q_{alg}$, the $Q_{oil}$ is fixed at 100 μl $h^{-1}$.

**Supplementary Video**

**Video S1** The generation process of microfibers containing deformed oil-droplet templates based on droplet micfluidics.

**Video S2** The breakup process of rod-like droplet within microfibers after collection.