Supporting Information

Fabrication of various cellulose microstructures via oil-templated regeneration of cellulose within a simple microfluidic system

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단일 미세유체장치를 이용한 셀룰로오스 재생을 통한 다양한 셀룰로오스 미세구조 제작

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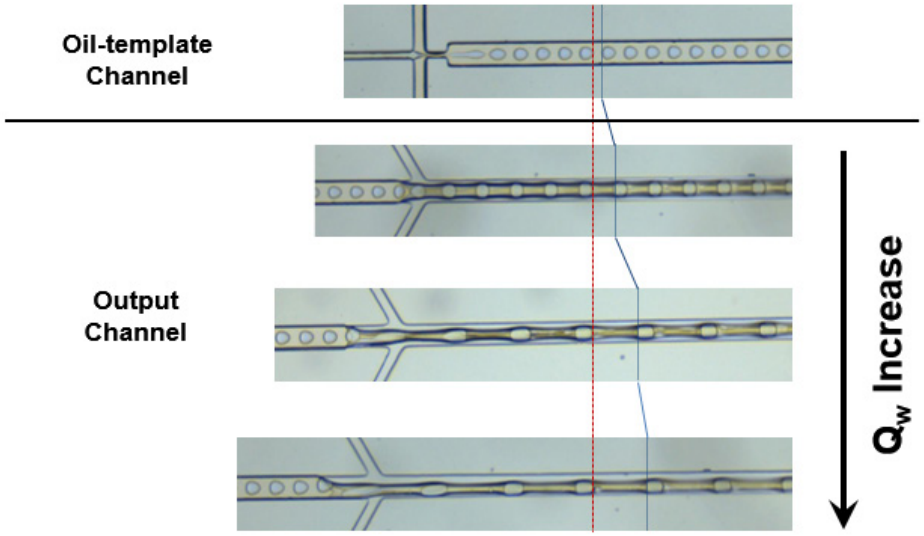

Figure. S1. Optical microscope images of the generation of oil droplets in the oil-template channel and cellulose fibers in the output channel. From the top to the bottom images, the flowrate of the aqueous phase (Q_W) in the output channel was 1.7, 3.3, and 5.0 μL min^{-1}, respectively; the ratio of the flowrates of the oil and cellulose-containing EMIM-Ac ($Q_{Oil}/Q_{C\text{-}IL}$) was fixed at 0.3.

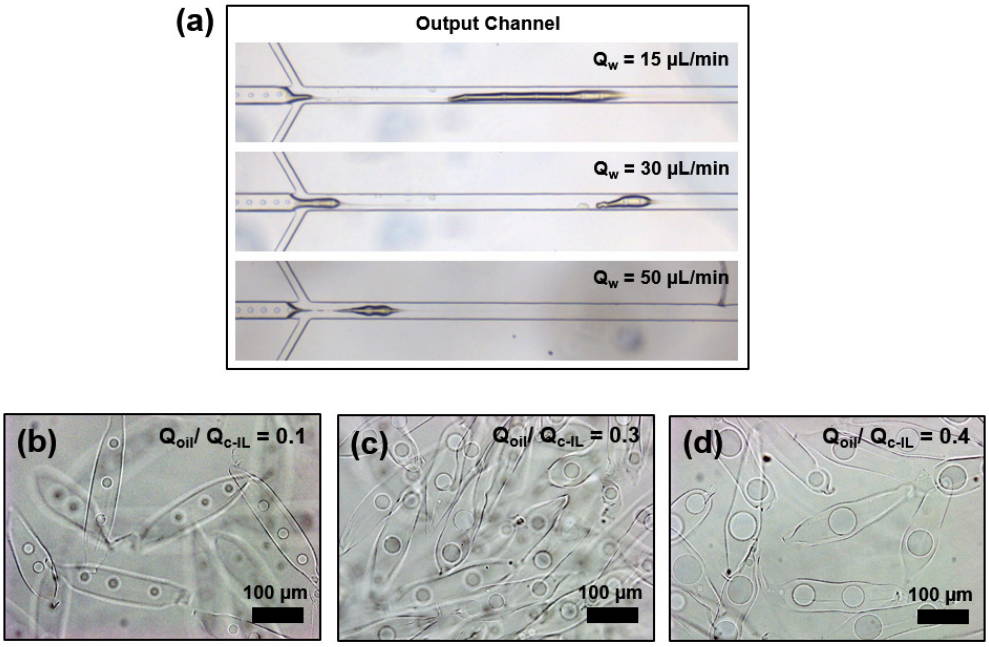

Figure. S2. (a) Optical microscope images of the generation of cellulose short threads embedded with oil droplets at different flowrates of the aqueous phase (Q_W = 15, 30, and 50 μL min^{-1}) and a fixed ratio of the flowrates of the oil and cellulose-containing EMIM-Ac ($Q_{Oil}/Q_{C\text{-}IL}$) was 0.1. (b)–(d) Bright-field images of the cellulose short threads produced at different $Q_{Oil}/Q_{C\text{-}IL}$ of 0.1, 0.3, and 0.4 and a fixed Q_W of 30 μL min^{-1}.

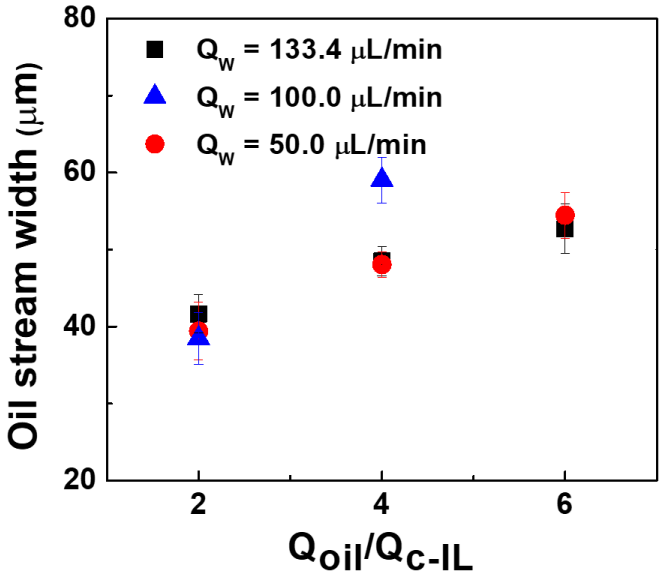

Figure. S3. Width of oil stream as function of the ratio of the flowrates of the oil phase and cellulose solution ($Q_{Oil}/Q_{C\text{-}IL}$).

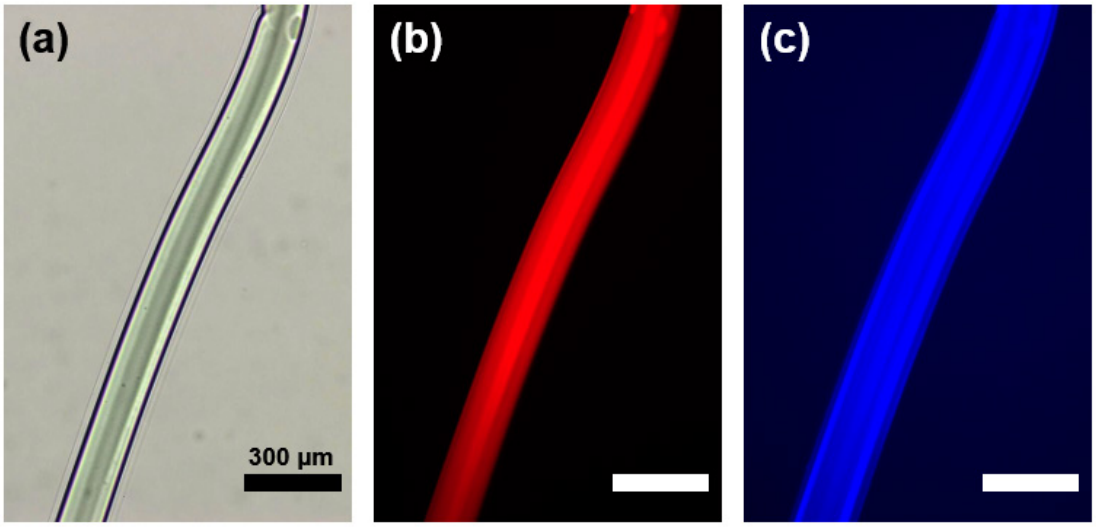

Figure. S4. (a) Bright-field and (b, c) fluorescent images of the cellulose tube in **Fig. 3c**. The oil phase and the cellulose-dissolved EMIM-Ac contained Oil Blue N dye and Sudan I dye, respectively. The cellulose tube was produced at $Q_{Oil}/Q_{C\text{-}IL}$ = 1.0 and Q_W = 3.0 μL min^{-1}.

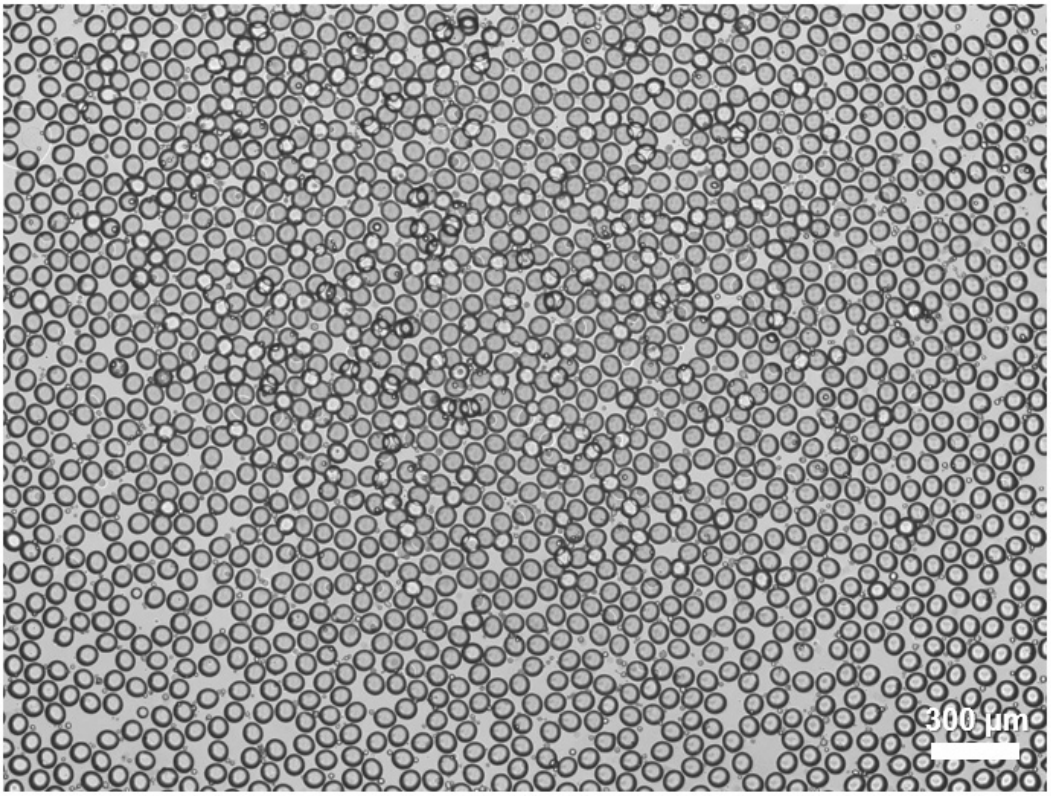

Figure. S5. Optical image of the cellulose capsules dispersed in water after 12 months of production. The microcapsules were synthesized at $Q_{Oil}/Q_{C\text{-}IL}$ = 2.0 and Q_W = 100 µL min^{-1}.

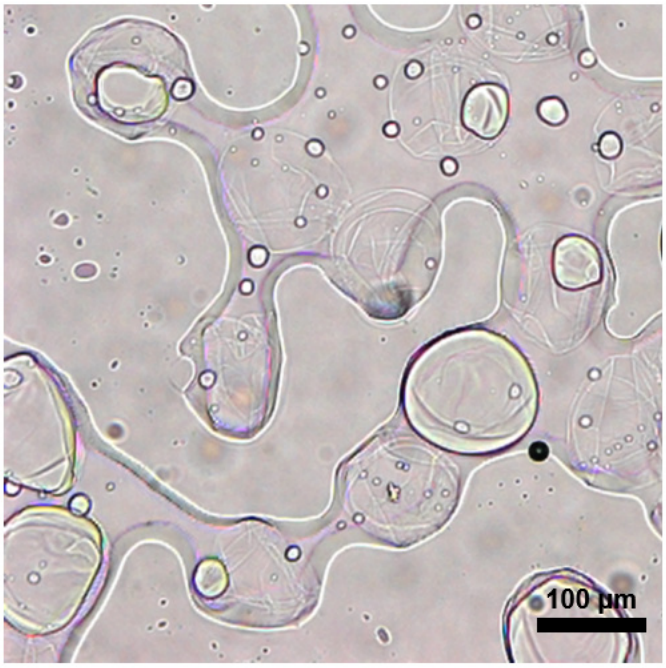

Figure. S6. Bright-field image of cellulose shells after removing oil cores from the cellulose capsules. After the cellulose capsule suspension was placed between the glass slide and the cover glass, the oil cores were squeezed out by pressing the cover glass.