

Lab on a Chip

Focusing Manipulation of microalgae in a microfluidic device using self-produced macromolecules

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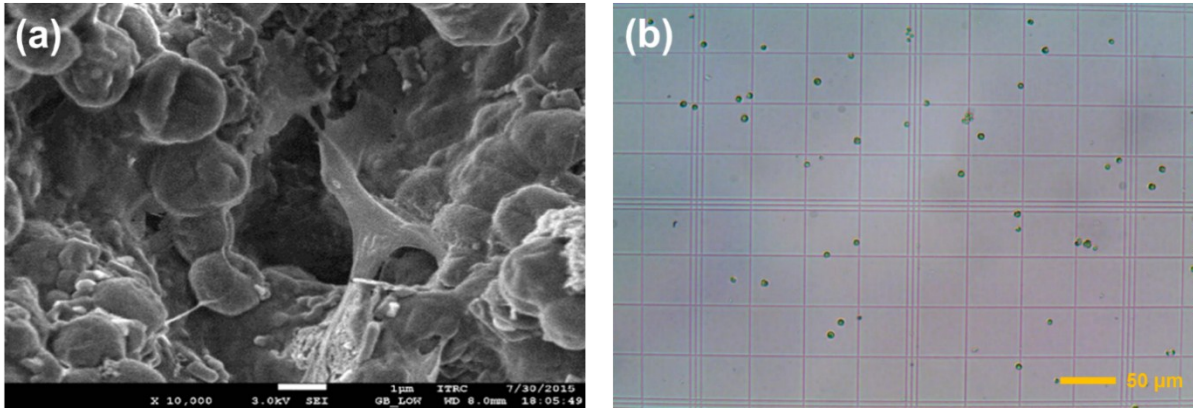
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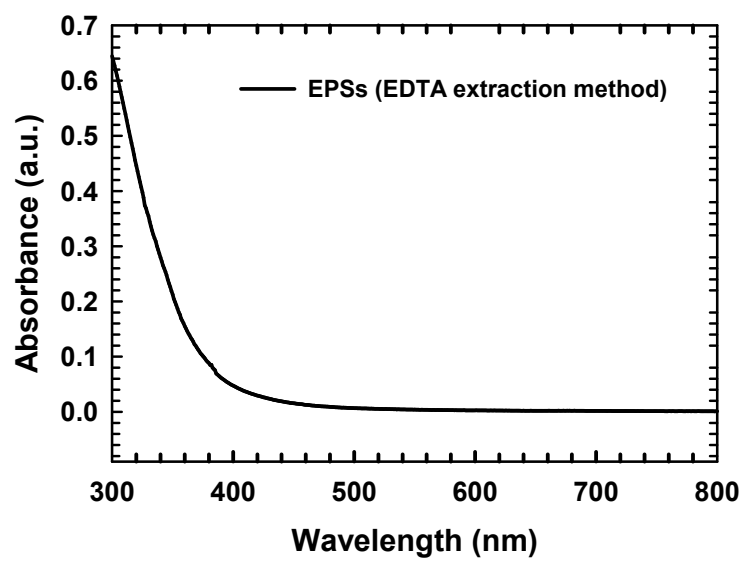
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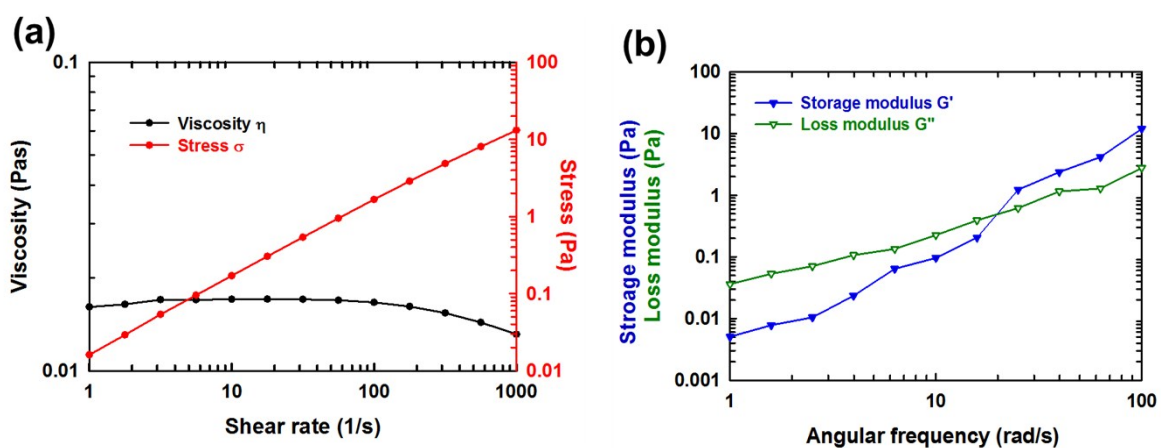
Figs. S1 to S6



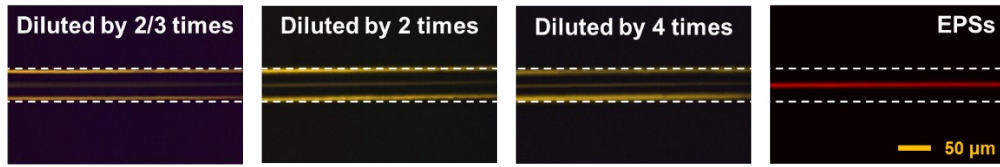
Supplementary Figure S1. (a) Scanning electron micrograph of *Chlorella vulgaris* in biofilm. The scale bar denotes a length of 1 μm. (b) Microscopic view of *Chlorella vulgaris*. The scale bar denotes a length of 50 μm.



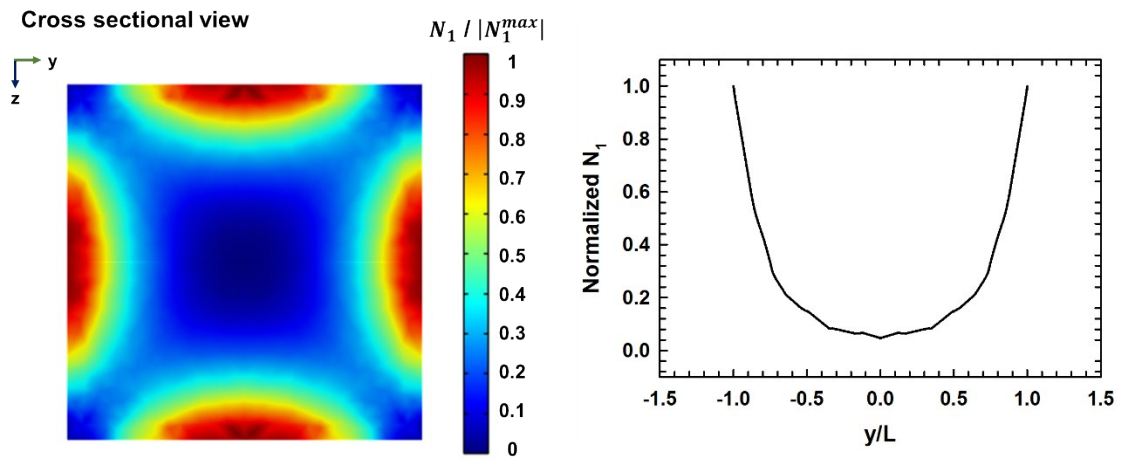
Supplementary Fig. S2 UV-Vis spectra of EPSs extracted from EDTA method.



Supplementary Figure S3. Rheological measurements of 0.9 wt% PEO solution. (a) Viscosity and shear stress in the range of shear rate from 1 to 1000 s^{-1} . (b) Storage modulus (G') and loss modulus (G'') as a function of angular frequency.

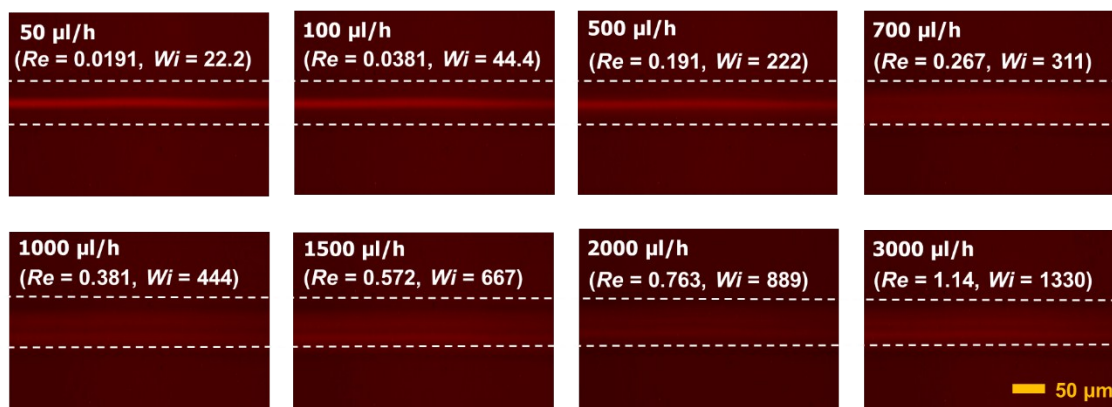


Supplementary Figure S4. Particle behavior of the different concentration of EPSs at a position of 5cm downstream from the inlet for 6.27 μm fluorescent PS particles with a flow rate of 50 $\mu\text{l/hr}$ ($Re = 0.0191$, $Wi = 22.2$). The scale bar is 50 μm .

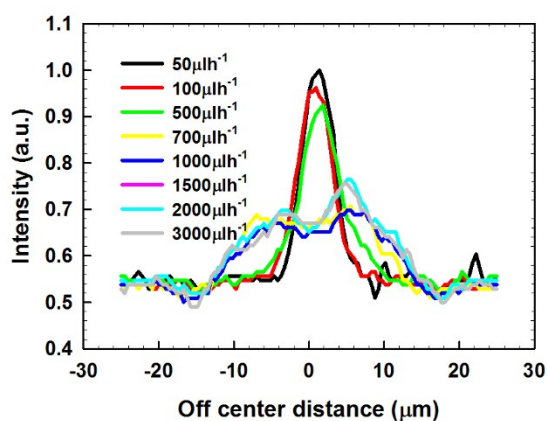


Supplementary Figure S5. Numerical simulation of the first normal stress difference (N_1). The value of the normalized N_1 shows symmetry at the cross-section of the channel.

(a)



(b)



Supplementary Figure S6. (a) Particle focusing behavior of the 0.9 wt% of PEO solution in a straight channel at flow rates of 50 - 3000 $\mu\text{l/hr}$ ($Re=0.0191-1.14, Wi=22.2-1330$). The scale bar is 50 μm . (b) Probability distribution function of PS particles under flow rates of 50 - 3000 $\mu\text{l/hr}$ ($Re=0.0191-1.14, Wi=22.2-1330$).