Electronic Supplementary Material (ESI) for Lab on a Chip

Supplementary Information

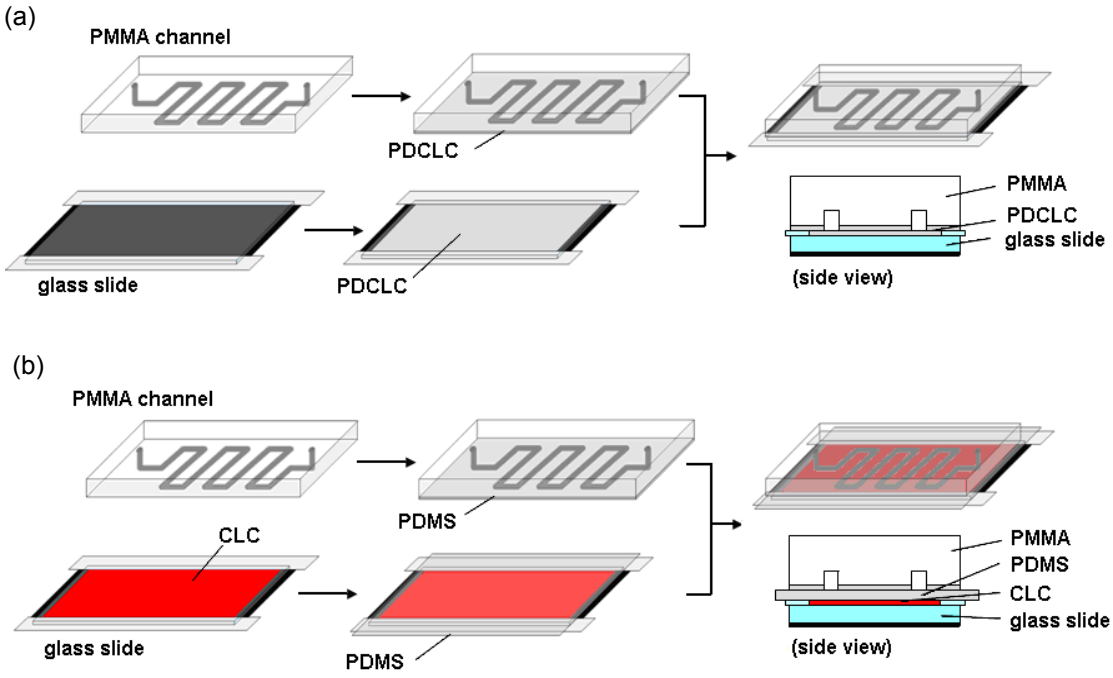

Fig. S1. Schematic showing the preparation of (a) microfluidic channels with embedded PDCLC and (b) microfluidic channels with embedded CLC.

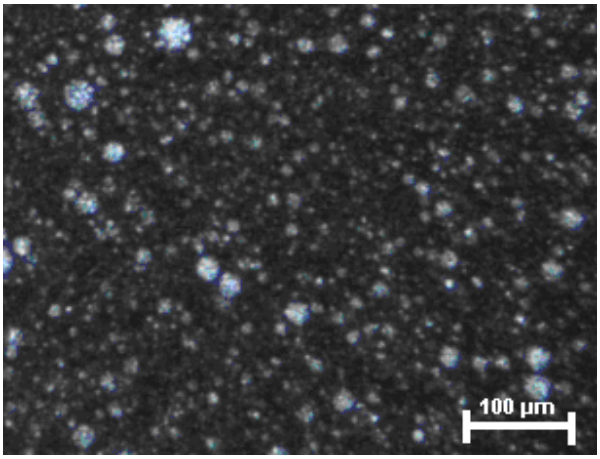

Fig. S2. Optical appearance of a PDCLC film in which CLC droplets (~10 µm) dispersed in the PDMS matrix. The PDCLC contains 25 wt% of CLC.

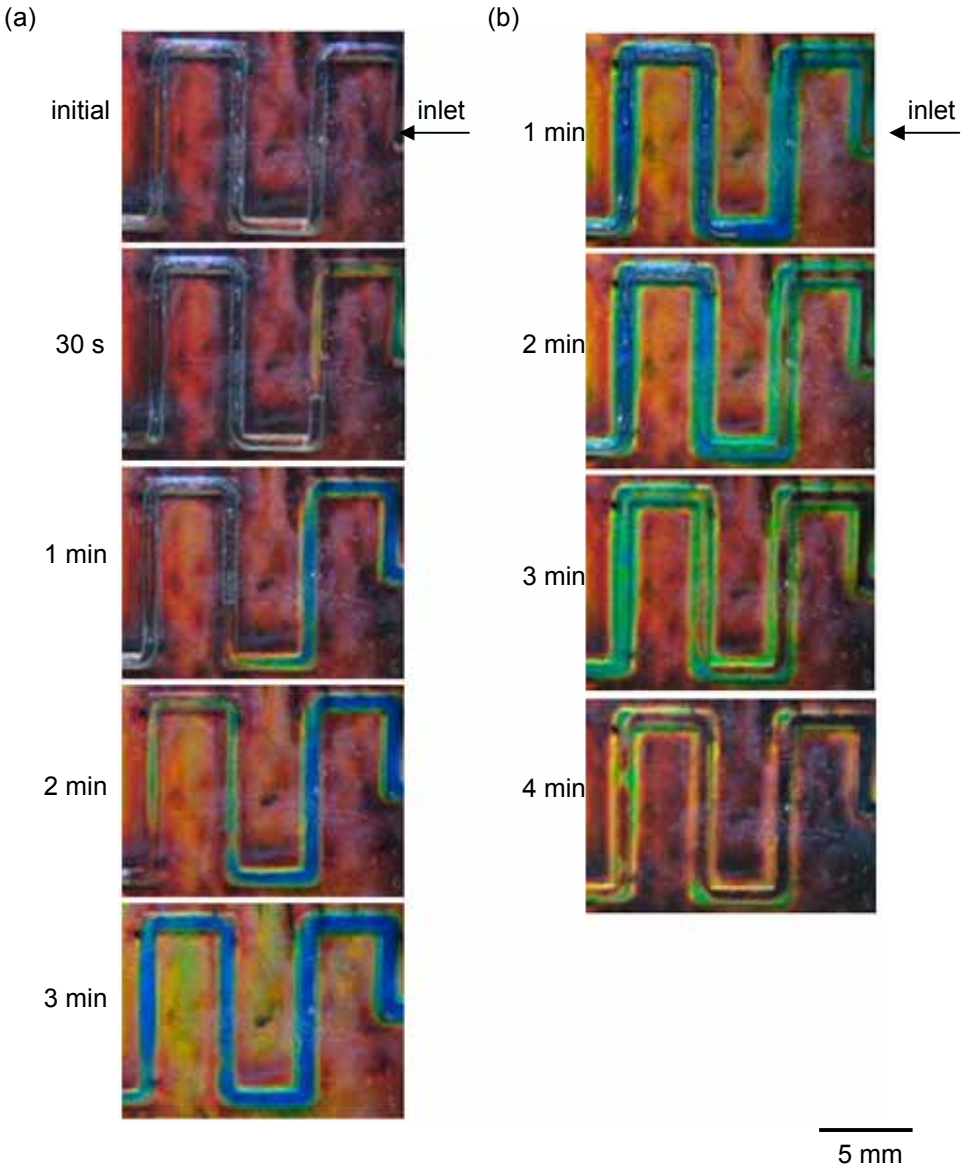

Fig. S3. Kinetics of the colorimetric response of CLC to ethanol in the channel. (a) 40% ethanol flows inside the channel at a flow rate of 70 µL/ min and (b) water flows inside the channel with a flow rate of 40 µL/ min to replace ethanol. In part a, blue color is fully developed at the inlet after 1 min. This is the time required to reach equilibrium in this system. In part b, the blue color completely disappears after 3 min.

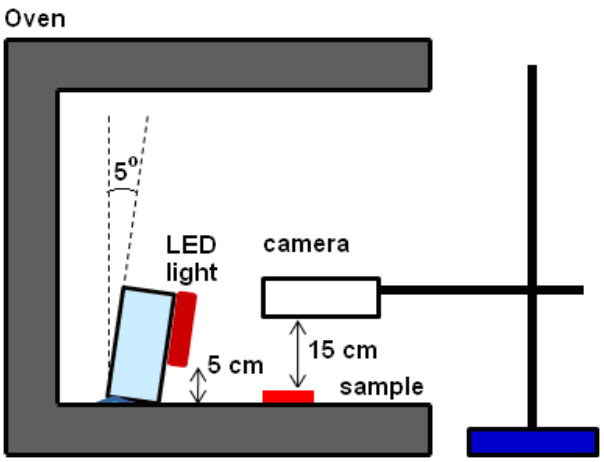

Fig. S4. Experimental set-up for lighting and imaging system used in this study. A microfluidic device was placed horizontally at the bottom of an oven maintained at a constant temperature. A camera was mounted vertically 15 cm above the microfluidic device. Light inside the oven comes from a white LED light which was mounted 5 cm above the device. The light was tilted 5° away from the vertical line. Same setting was used for all experiments.

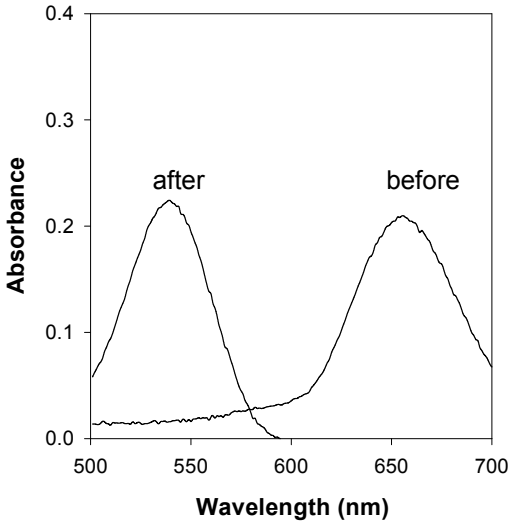

Fig. S5. Visible spectra of CLC before and after immersion in 5% ethanol solution. The peak absorbance shifts from 654 nm to 538 nm after the immersion.

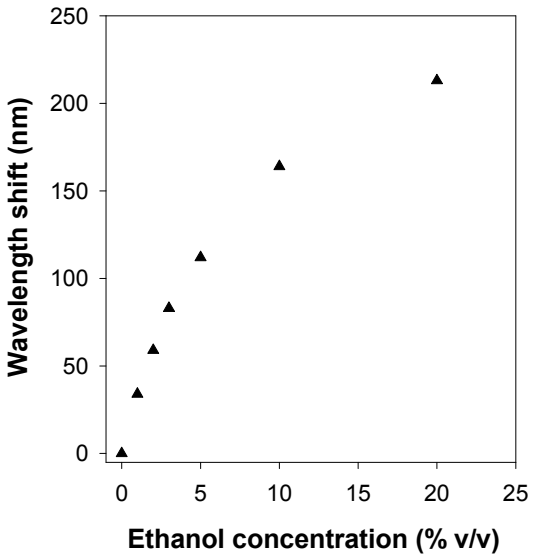

Fig. S6. A calibration curve for ethanol concentration based on the shift in peak wavelength of CLC.

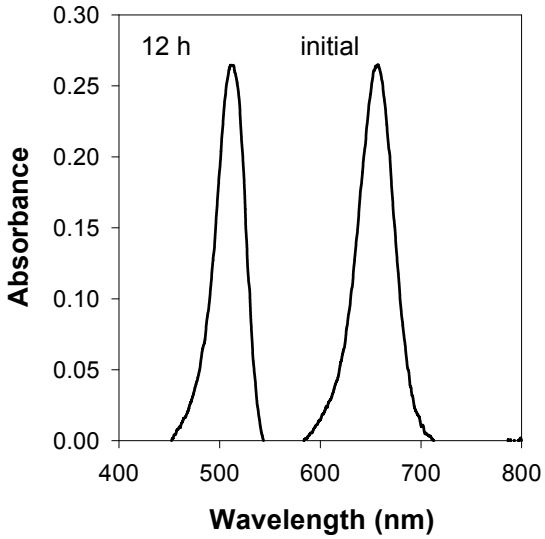

Fig. S7. Visible spectra of CLC immersed in a fermentation solution. After 12 h of fermentation, the peak of the spectra shifts from its initial position at 654 nm to 509 nm. The total shift in wavelength is 145 nm, which corresponds to 7% ethanol solution based on Figure S6.