

Supplementary Information

# Motor-like Microlasers Functioning in Biological Fluids

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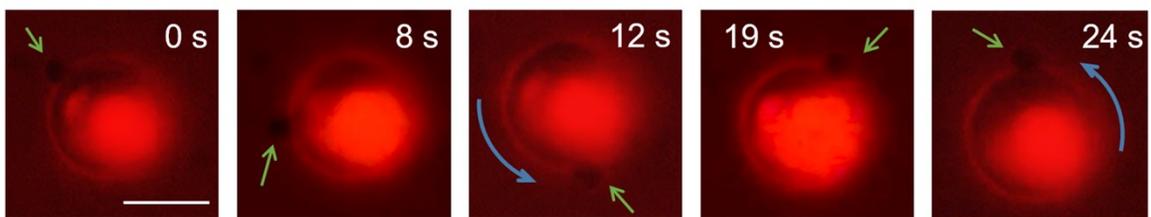
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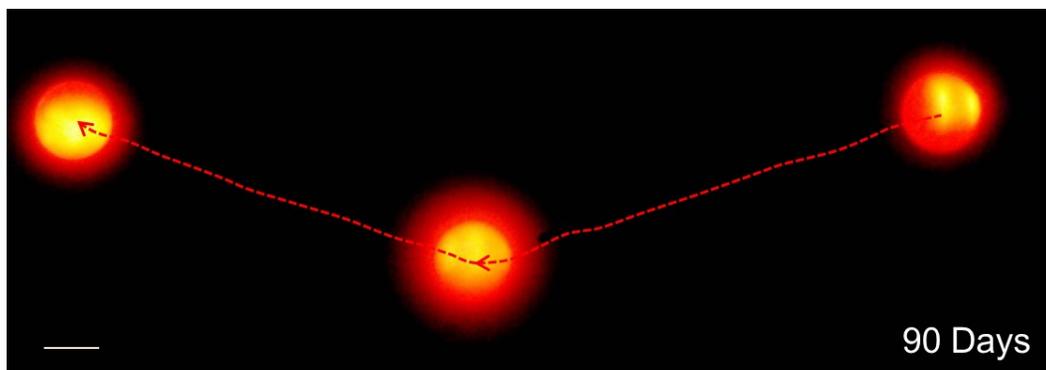
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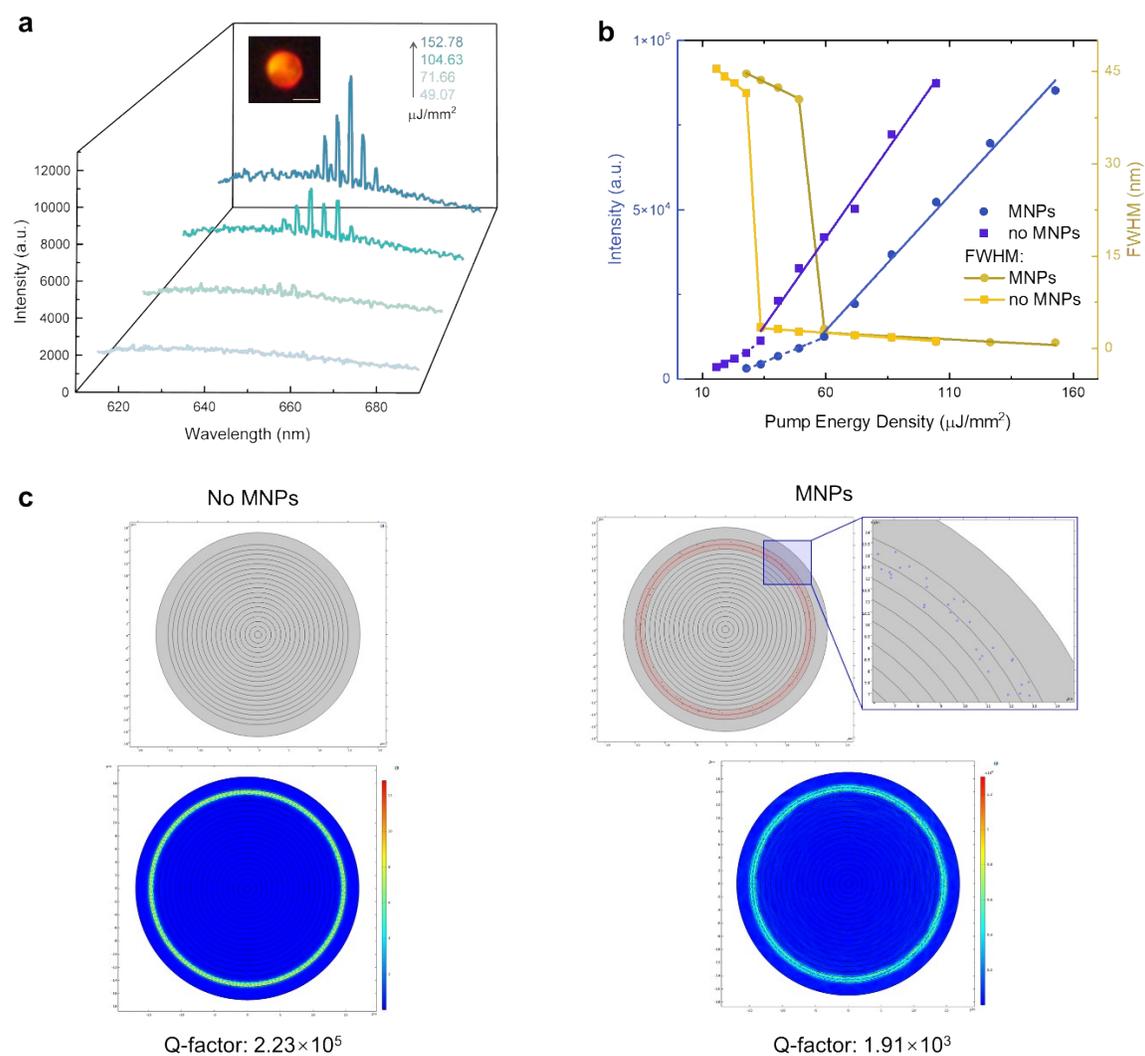
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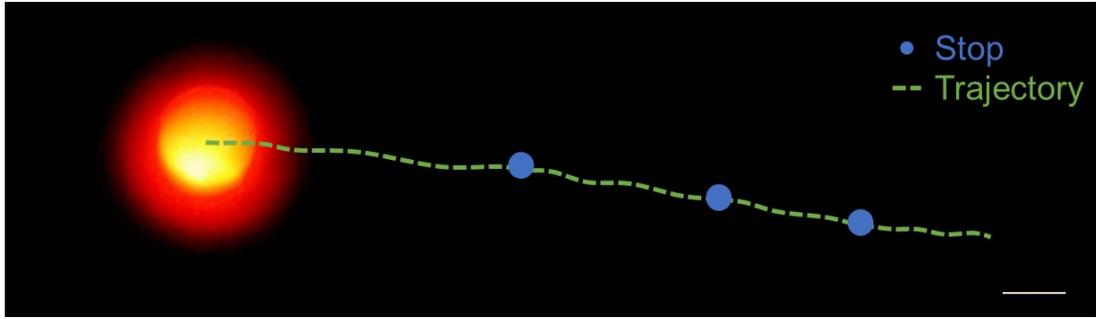
**Figure S1** Self-rotation of NR-doped lasing micromotor by employing the rotating magnetic field at different times. The green arrow shows the position of comparable reference attached to the lasing micromotor. Scale bar: 20  $\mu\text{m}$ .



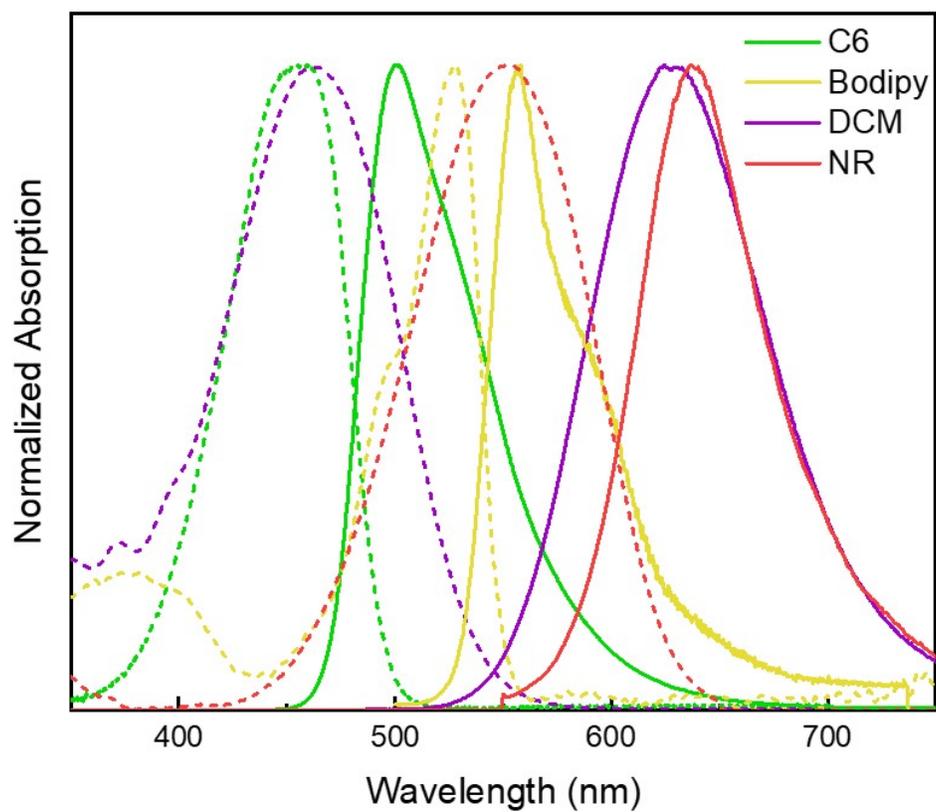
**Figure S2** Lasing micromotor after 90 days storage (with 0.1 wt% MNPs doped, and 10 Gs external magnetic field applied). Scale bar: 20  $\mu\text{m}$ .



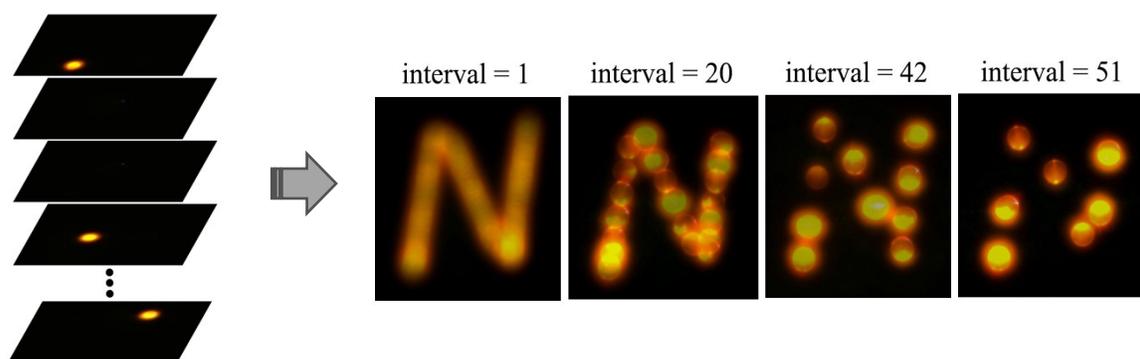
**Figure S3** (a) Photoluminescence spectra of lasing micromotor (MNP-doped CLC microdroplet) under different pump fluences. (b) Full-width-at-half-maxima (FWHM) and lasing threshold plot of lasing micromotor with MNPs and without MNPs. (c) Simulated Q-factor of lasing micromotor with MNPs (0.050 wt%) and without MNPs. (MNPs were randomly distributed around the droplet by inducing scattered particles inside the outer shell of the droplet model.)



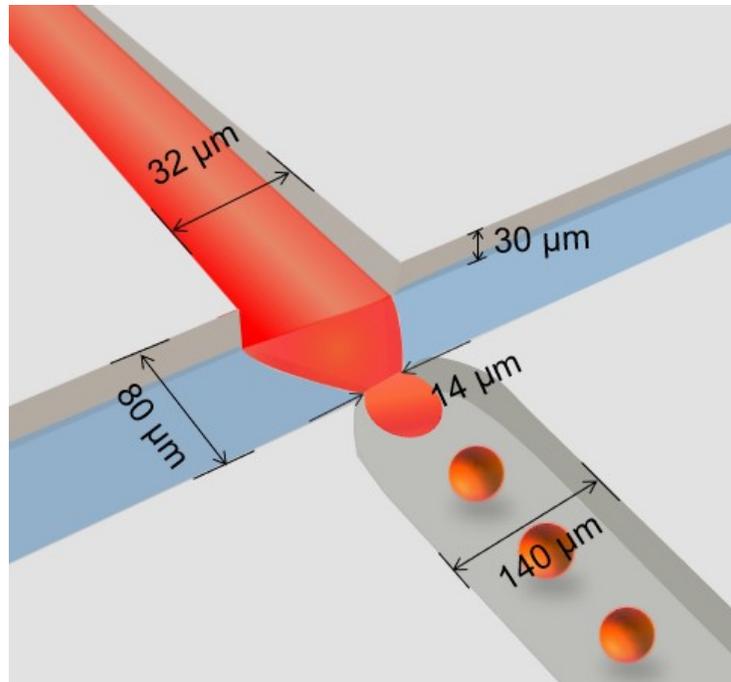
**Figure S4** Magneto-switchable behaviors. Scale bar: 20  $\mu\text{m}$ .



**Figure S5** Normalized absorption (dashed-line) and emission spectra (solid-line) of the corresponding dyes (C6, Bodipy, DCM, and NR) in immersion oil solution.



**Figure S6** Laser emissions from micromotor captured by high-speed CCD under different time frames. All the images captured under different time frame were then stacked together to form a trajectory image of the micromotor. The selection of time interval will also result in different writing patterns and resolution.



**Figure S7** Schematic of the microfluidic channel with accurate dimensions.