

## Supporting Information

# Nanoparticle Mediated Micromotor Motion

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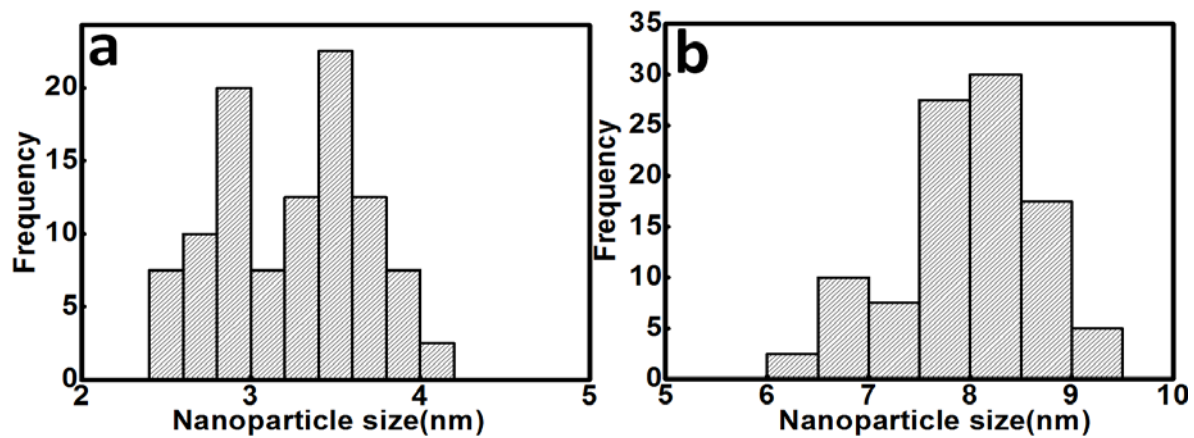
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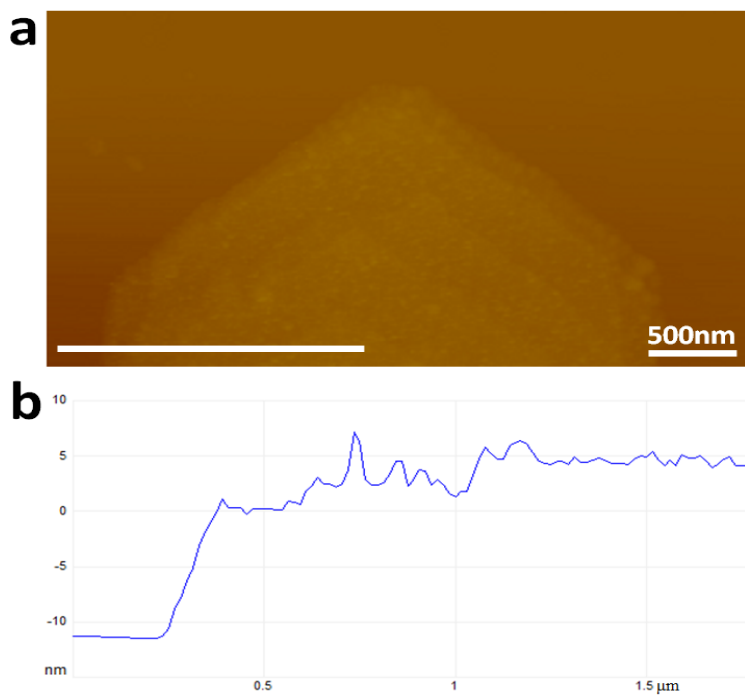
**Video S1.** One Pt-PCL micromotor moves autonomously in 10% H<sub>2</sub>O<sub>2</sub> aqueous solution.

**Video S2.** The motion and the remote control of a Pt-PCL-Fe<sub>3</sub>O<sub>4</sub>NP<sub>7500</sub> micromotor in 10% H<sub>2</sub>O<sub>2</sub> aqueous solution. The external magnetic field is applied around 2 s.

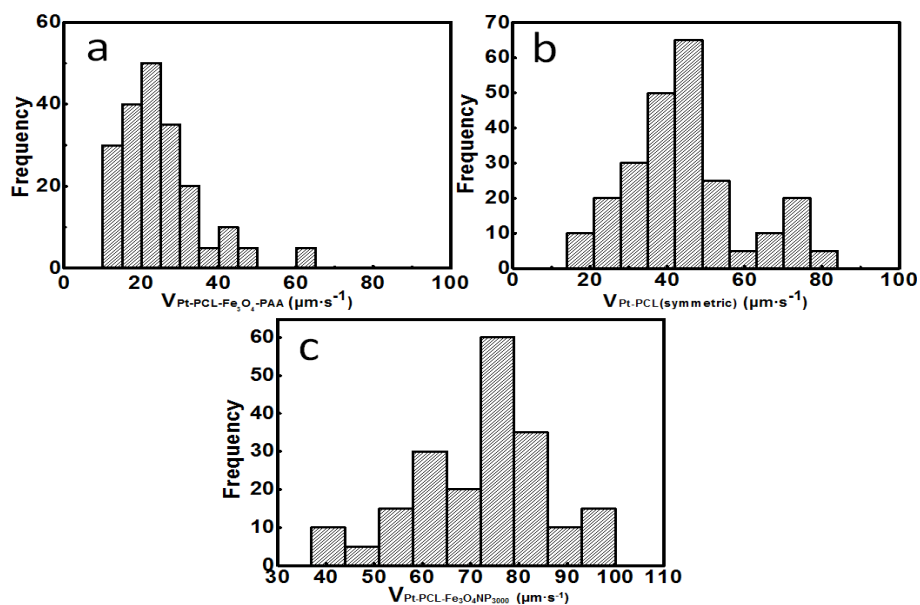
**Video S3.** The velocity changes of the Pt-PCL-Fe<sub>3</sub>O<sub>4</sub>NP<sub>7500</sub> micromotor before and after applying a 5 kV/m electric field. The 5 kV/m electric field is turned on around 3 s.



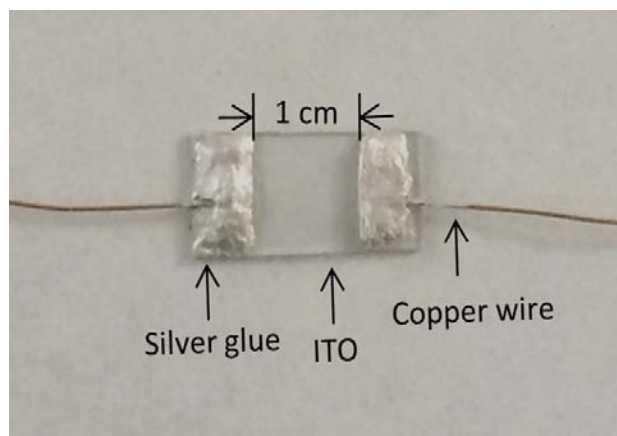
**Fig. S1** Size distribution histograms of PtNPs (a) and Fe<sub>3</sub>O<sub>4</sub>NPs (b) measured from Fig. 1 in the main text.



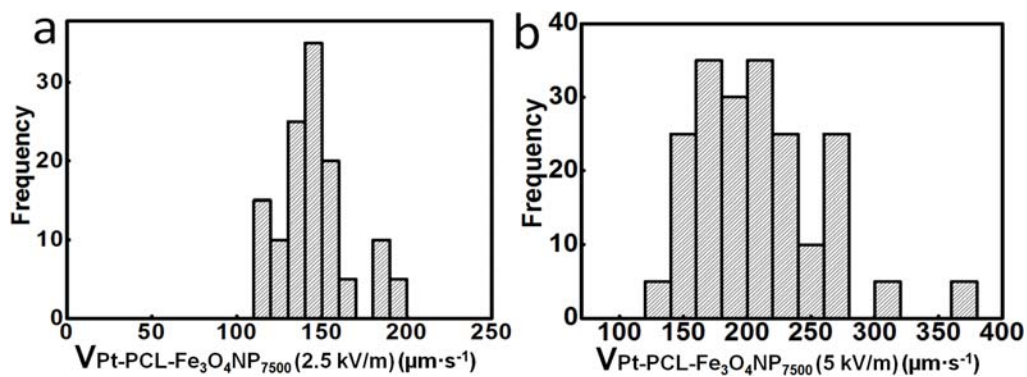
**Fig. S2** (a) AFM image of the Pt-PCL-Fe<sub>3</sub>O<sub>4</sub>NP<sub>7500</sub> micromotor and (b) the corresponding section analysis of (a).



**Fig. S3** Histograms of the velocity ( $V$ ) of the Pt-PCL-Fe<sub>3</sub>O<sub>4</sub>-PAA (a), Pt-PCL(symmetric) (b) and Pt-PCL-Fe<sub>3</sub>O<sub>4</sub>NP<sub>3000</sub> (c) micromotors.



**Fig. S4** The setup utilized for the electric field experiment. The silver glue is pasted on the ITO surface with a separation of 1 cm. Then the copper wires, which are connected to a DC power supply, are also glued by utilizing the silver paste.



**Fig. S5** Histograms of the velocity ( $V$ ) of the Pt-PCL-Fe<sub>3</sub>O<sub>4</sub>NP<sub>7500</sub> micromotors when applying a 2.5 kV/m (a) and 5.0 kV/m (b) electric field.