

## Electronic Supplementary Information (ESI)

# A fast and powerful swimming microrobot with a serrated tail enhanced propulsion interface

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## 1. Supplementary Video Description

**Video S1.** Movement of three-channel swimming microrobot along a rectangular under the control of an external magnet.

**Video S2.** Movement of swimming microrobots with serrated tails in 20% H<sub>2</sub>O<sub>2</sub>.

**Video S3.** Huge cargo transport by the powerful four-channel swimming microrobot in 20% H<sub>2</sub>O<sub>2</sub>.

## 2. Supplementary Table Description

**Table S1** Moving speed of swimming microrobots with single-channel, double-channel, three-channel and four-channel serrated tails in 20% H<sub>2</sub>O<sub>2</sub> solution.

Microrobots	Single-channel	Double-channel	Three-channel	Four-channel
Speed(μm/s)	34	121	294	1026

### 3. Supplementary Figures Description

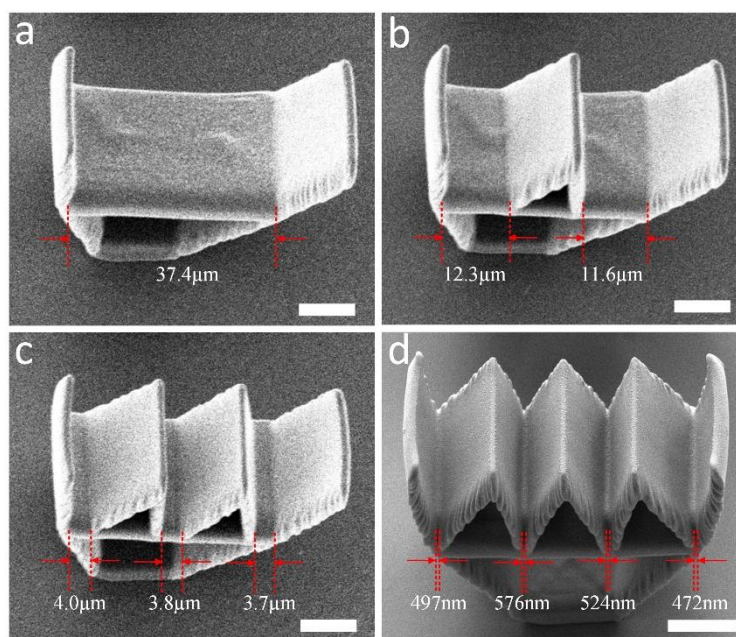


Fig. S1. SEM images of the swimming microrobots with serrated tails. (a) Single-channel tail with one flat of 37.4 μm, (b) Double-channel tail with two flats of 12.0 μm, (c) Three-channel tail with three flats of 3.8 μm, (d) Four-channel tail with four nanointerfaces of 517.2 μm. Scale bar: 10 μm.

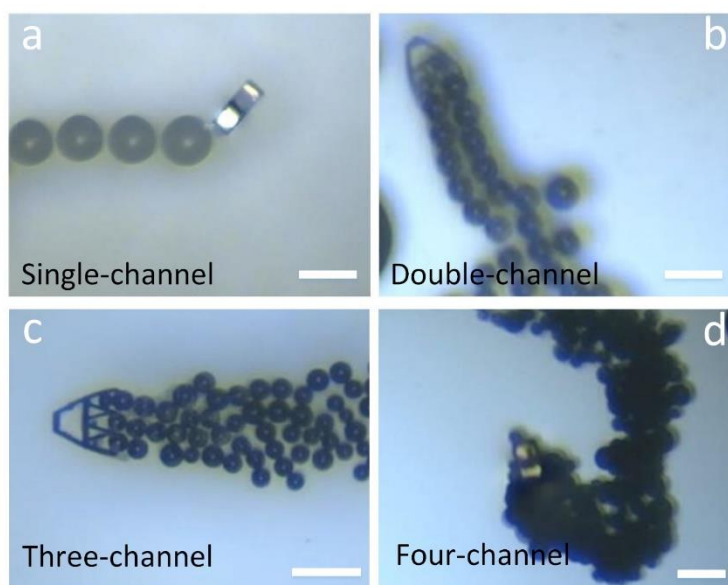


Fig. S2. Oxygen bubbles from the swimming microrobots during the catalytic reaction in 20% H<sub>2</sub>O<sub>2</sub>. (a) Single-channel tail with a line of oxygen bubbles, (b) Double-channel tail with two lines of oxygen bubbles, (c) Three-channel tail with three lines of oxygen bubbles, (d) Four-channel tail with four-lines of oxygen bubbles. Scale bar: 50 μm.

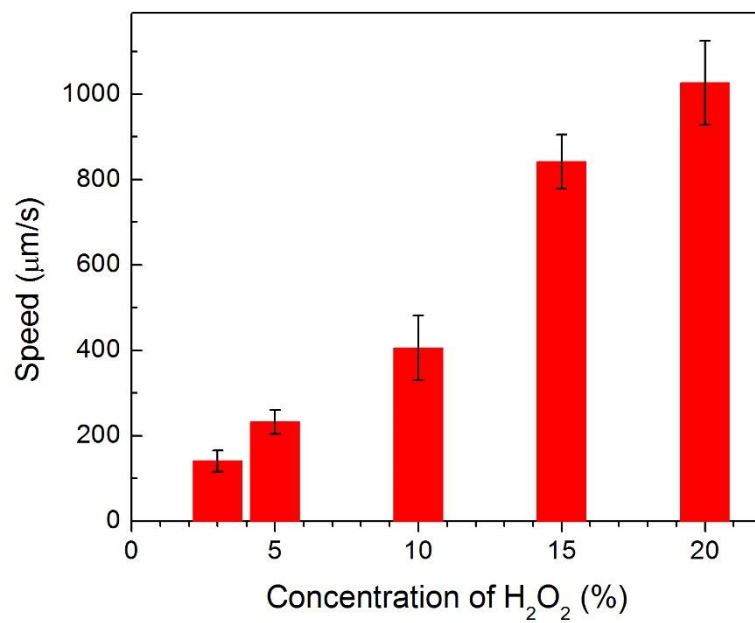


Fig. S3 Moving speed of the four-channel swimming microrobot as a function of the H<sub>2</sub>O<sub>2</sub> concentration.