

## Supporting Information

### **Magnetically Controlled Reversible Shape-morphing Microrobots with Real-time X-ray Imaging for Stomach Cancer Applications**

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## Supplementary Materials

Table S1. Design parameters of the EMA system.

Figure S1.  $^1\text{H}$  NMR spectrum of mTIB.

Figure S2. The optical system used for microrobot fabrication.

Figure S3. Illustration of the chamber, which was fabricated using a three-dimensional printer.

Figure S4. Digital photographs of each material at different pH values (a) Composite resin (b) pHEMA.

Figure S5. Digital photographs of microrobot locomotion in a stomach-like channel.

Movie S1. Shape-morphing under different pH solution in petri dish (scale bar: 4 mm).

Movie S2. Locomotion performance under EMA system in 3D-printed stomach mimicked channel (scale bar: 4 mm).

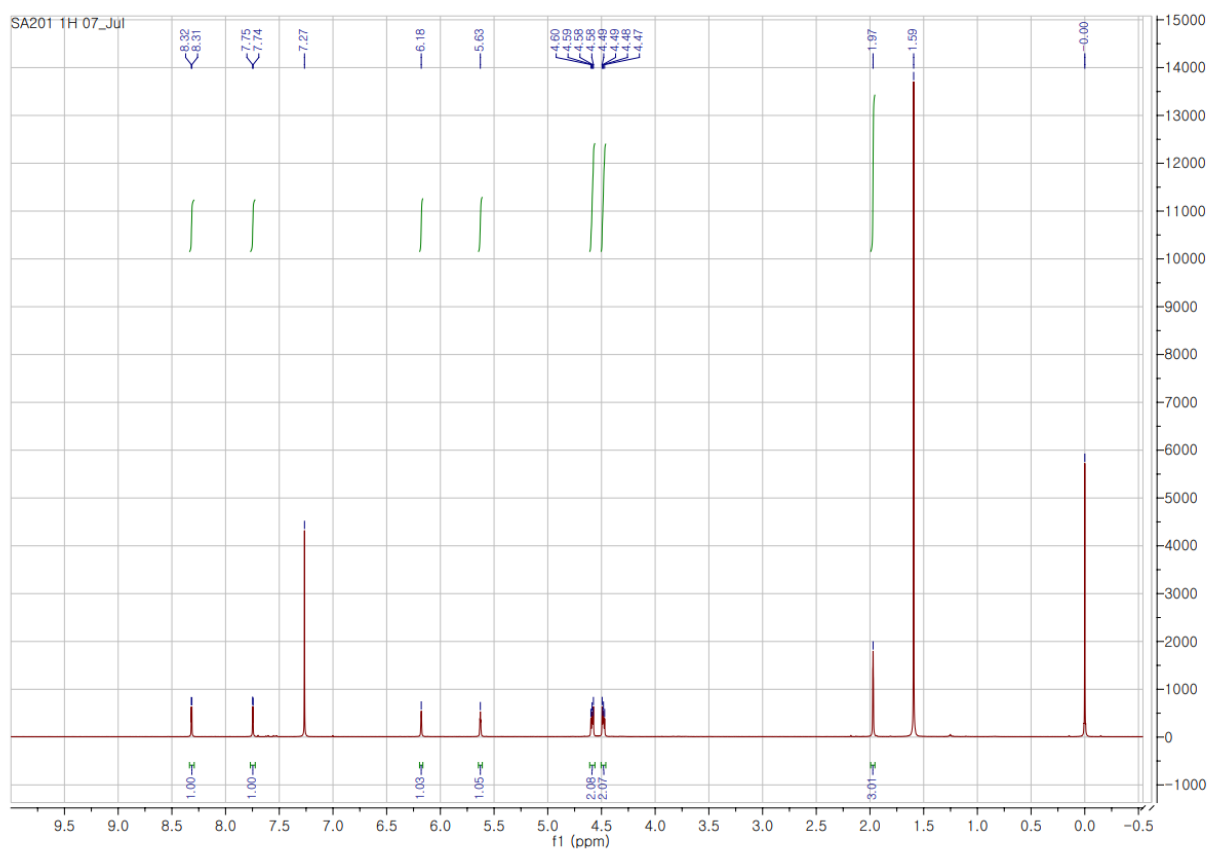
Movie S3. Locomotion performance under EMA system in pig's stomach (scale bar: 4 mm).

Movie S4. Shape-morphing with pH solution manipulation in pig's stomach (scale bar: 4 mm).

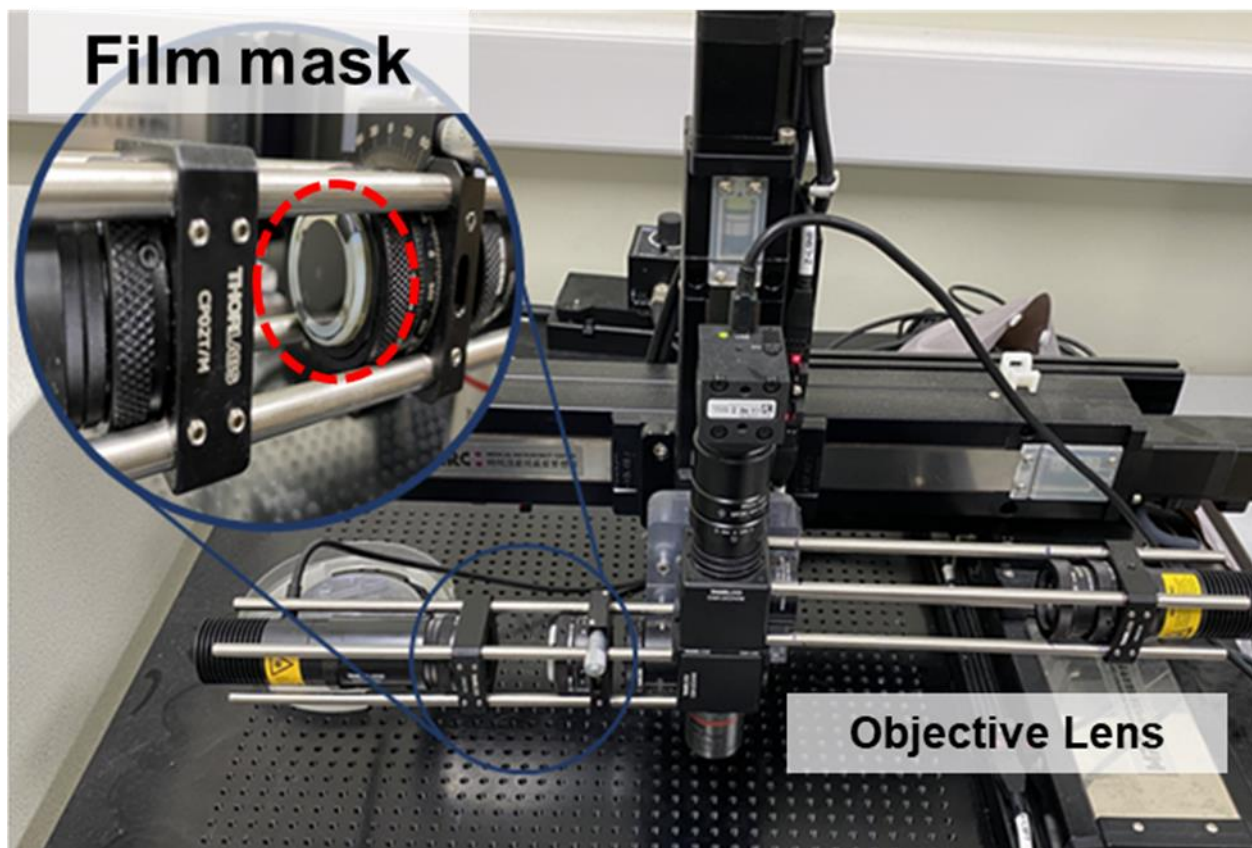
Movie S5. X-ray imaging which integrated with EMA system in pig's stomach (scale bar: 2 mm)

**Table S1. Design parameters of the EMA system.**

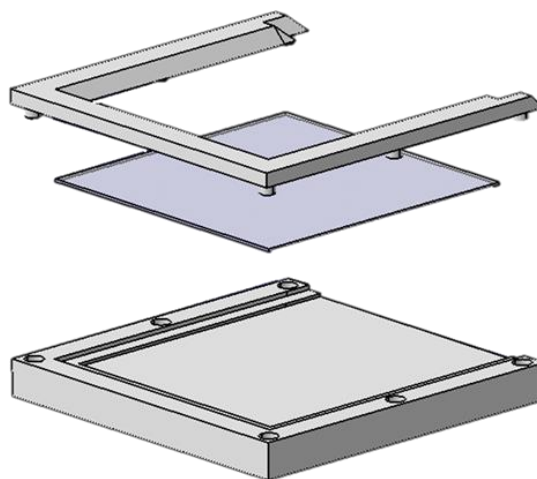
<b>Parameter</b>	<b>Value</b>
Workspace diameter (mm)	40
Distance from end of the coil to the center of a workspace (mm)	60
Wire diameter (mm)	1.6
Number of turns	1368
Coil inner diameter (mm)	40
Coil outer diameter (mm)	77
Coil length (mm)	210
Core diameter (mm)	40
Core length (mm)	240
Resistance ( $\Omega$ )	2.2



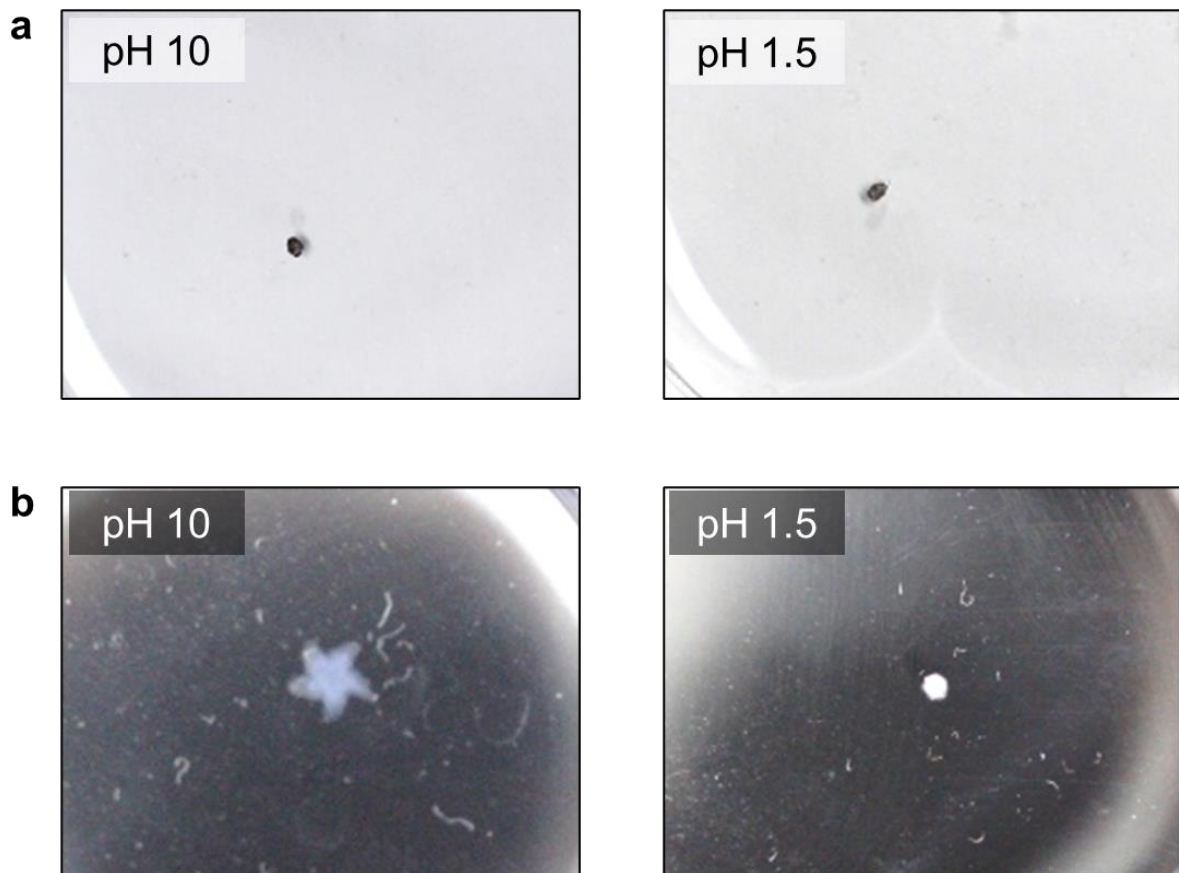
**Fig. S1.**  $^1\text{H}$  NMR spectrum of mTIB.



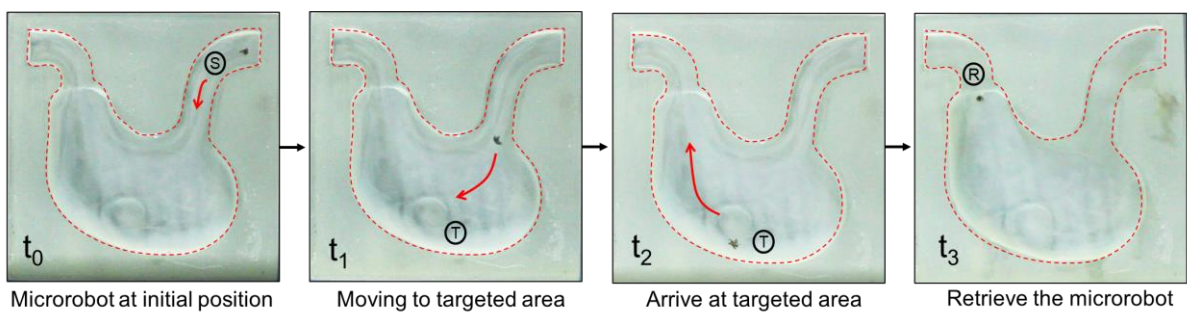
**Fig. S2.** The optical system used for microrobot fabrication.



**Fig. S3.** Illustration of the chamber, which was fabricated using a three-dimensional printer



**Fig. S4.** Digital photographs of each material at different pH values (a) Composite resin (b) pHEMA.



**Fig. S5.** Digital photographs of microrobot locomotion in a stomach-like channel.