

File Name: Supplementary Information

Description: Supplementary Figures

File Name: Supplementary Movie 1

Description: Preparation protocol of the drug-loaded Mg-based micromotors.

File Name: Supplementary Movie 2

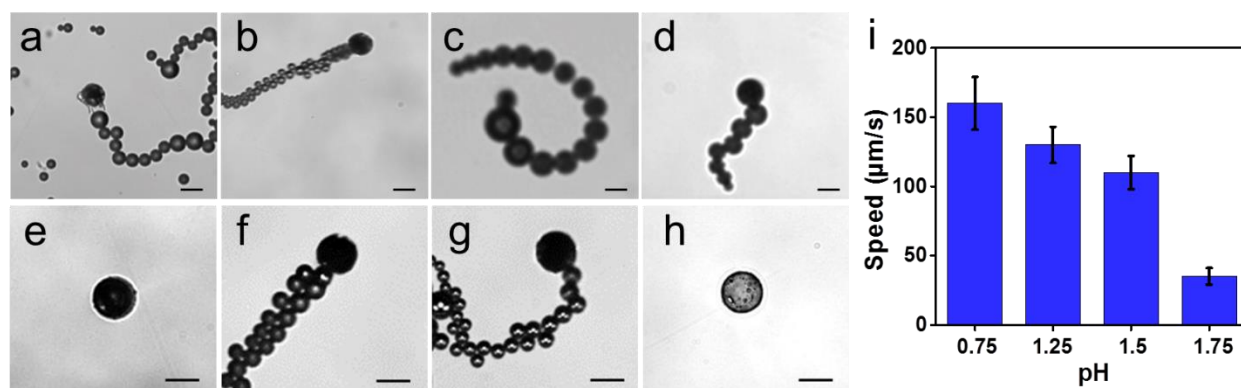
Description: In vivo self-propulsion of drug-loaded Mg-based micromotors in the gastric fluid of the stomach.

File Name: Supplementary Movie 3

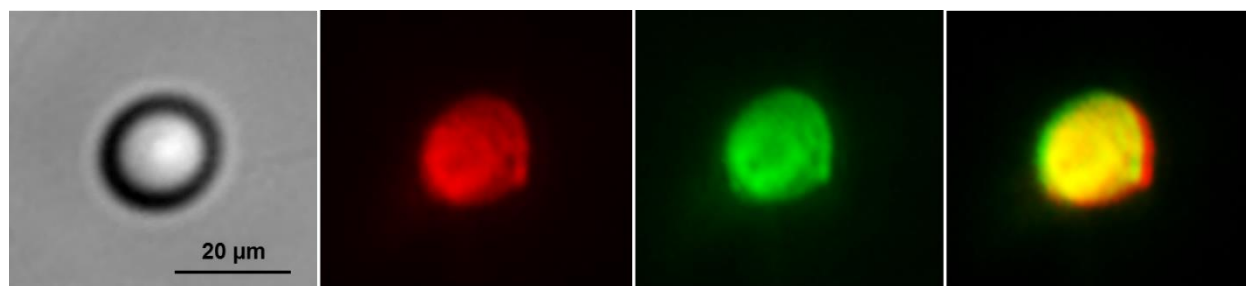
Description: Autonomous movement of drug-loaded Mg-based micromotors in simulated gastric fluid.

File Name: Supplementary Movie 4

Description: Movement of drug-loaded Mg-based micromotors in simulated gastric fluid adjusted to different pHs.



Supplementary Figure 1. Propulsion characterization of the drug-loaded Mg-based micromotors. Time-lapse images (corresponding to Supplementary Movie 4) showing the motion of the drug-loaded Mg-based micromotors in (a) pH 0.75, (b) pH 1.25, (c) pH 1.5, and (d) pH 1.75. Time-lapse images showing the lifetime of the drug-loaded Mg-based micromotor in simulated gastric fluid (pH ~1.3); from e to h: 0, 1, 5 and 8 min after gastric fluid simulant addition, respectively. (i) Dependence of the micromotor speed upon the gastric fluid pH. Scale bar, 20 μm . Surfactant level, 1% Triton X-100. Error bars estimated as a triple of s.d. ($n = 6$).



Supplementary Figure 2. Characterization of dye-loaded chitosan-PLGA-silica Janus microparticles. Microscopy images of dye-loaded chitosan-PLGA-Si Janus microparticles: optical image, and fluorescence images showing the dye-loaded Si-based Janus microparticles in DiD channel, FITC-D channel, and overlay of the two channels.