

## Description of Additional Supplementary Files

File Name: Supplementary Movie 1

Description: Ingestible hydrogel device swelling in water. The movie plays at 32X realtime speed.

File Name: Supplementary Movie 2

Description: Ingestible hydrogel device swelling in simulated gastric fluid (SGF, pH 3). The movie plays at 32X real-time speed.

File Name: Supplementary Movie 3

Description: Ingestible hydrogel device deswelling in water induced by 0.6 M CaCl<sub>2</sub>. The movie plays at 40X real-time speed.

File Name: Supplementary Movie 4

Description: Ingestible hydrogel device deswelling in SGF induced by 0.6 M CaCl<sub>2</sub>. The movie plays at 40X real-time speed.

File Name: Supplementary Movie 5

Description: Compression of water-saturated ingestible hydrogel device to 90% strain. The movie plays at 4X real-time speed. The white-colored hydrogel device contains barium sulfate in the membrane.

File Name: Supplementary Movie 6

Description: Compression of SGF-saturated ingestible hydrogel device to 90% strain. The movie plays at 4X real-time speed. The white-colored hydrogel device contains barium sulfate in the membrane.