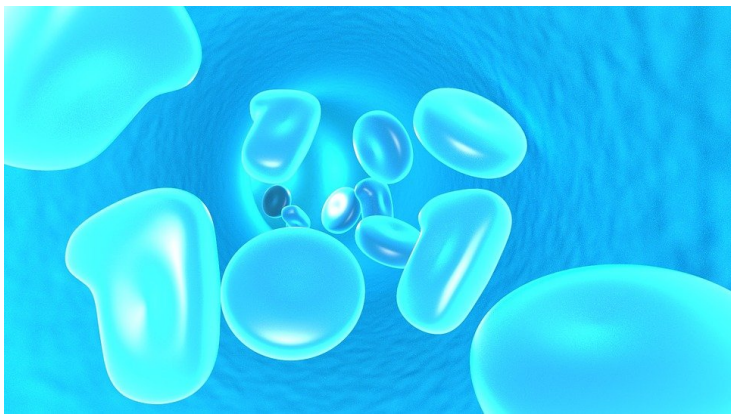
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Scientists create novel hydrogel for safer drug delivery

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The hydrogel is tough and triggerable, meaning it can withstand the forces of the GI environment and can be triggered to dissolve using an external stimulus.



Drug-releasing devices that reside in the stomach for extended periods of time make it easier for patients to receive their full course of treatment. Instead of having to take a pill every day for a long period of time, a drug-delivery vehicle that slowly releases individual doses of medication could be administered once but provide medication for weeks or months.

Swallowable drug delivery systems are typically made of tough plastics such as thermoplastics or thermosets, but these materials present safety concerns in that they can cause physical obstructions in the gastrointestinal (GI) tract and are difficult to remove in the case of an allergic reaction. Instead, hydrogels, which are softer and potentially more biocompatible, are an appealing alternative for gastric resident systems.

Researchers from Brigham and Women's Hospital, Massachusetts Institute of Technology and the Koch Institute for Integrative Cancer Research have created a novel hydrogel material. The hydrogel is tough and triggerable, meaning it can withstand the forces of the GI environment and can be triggered to dissolve using an external stimulus.

However, the challenge with classic hydrogels is that they are relatively weak. The gastric cavity experiences significant forces associated with contractions of the stomach, so the new hydrogels need to be tough enough to withstand the strain. The researchers tested the tough, triggerable hydrogels in a large animal model which demonstrated the potential of this material.

The next step in their research will be additional pre-clinical studies to further test the safety and stress resistance of the hydrogels before they can be used in people.