Gel-like material shows promise as oral insulin pill for diabetes

Researchers in Texas report development of a gel-like material that could help speed the long-awaited arrival of insulin that can be taken in a pill by mouth, rather than with injections. The study is scheduled for the April 14 issue of ACS' *Biomacromolecules*.

In the report, Nicholas A. Peppas and colleagues point out acid in the stomach destroys insulin, preventing its administration by mouth. Many different research groups worldwide are searching for ways to overcome that obstacle. However, an ideal material for safe, effective oral delivery remains elusive.

The new study describes a promising candidate in the form of a polymer hydrogel that responds to changes in pH levels. This hydrogel has been modified by the addition of wheat germ agglutinin tethers, or anchors, that allow it to interact with the lining of the upper small intestine.

In laboratory tests, the gel-like substance containing insulin expands in the acidic environment of the stomach and protects the drug from destruction by stomach acids. Upon exposure to the alkaline environment of the small intestine, the site of insulin absorption, the polymer shrinks and releases insulin.

The addition of wheat germ agglutinin, a type of sticky plant sugar, allows the polymer to stick to the small intestine for prolonged periods. This improves the duration of insulin absorption, the researchers say.

Source: ACS