

## Preparing a New Solution for Acid Reflux

by Chuck Brown

**T**ake baking soda, mother's home remedy for an upset stomach, and mix it with some other wonder drugs and out comes a new medicine for acid reflux.

It started as a medicine to stop critically-ill patients on ventilators from developing ulcers, but then UNMC researcher, Keith Olsen, Pharm.D., and a colleague at the University of Missouri-Columbia cooked up something different.

Dr. Olsen, professor and chairman of pharmacy practice, and a 1980 alumnus, was asked by Mizzou's Jeff Phillips, Pharm.D., to collaborate in 1996 on a drug aimed at eliminating ulcers in surgical patients on ventilators.

"These are critically ill patients who haven't been able to eat anything, so the acid just sits in the stomach and eats away at the lining," Dr. Olsen said. "This leads to multiple ulcers forming in the stomach."

To stop this, Drs. Phillips and Olsen modified the drug Omeprazole – a drug that stops the acid where it starts in the stomach's parietal cells.

Parietal cells contain proton pumps, which send acid into the stomach to break down food. Omeprazole is what is known as a proton pump inhibitor (PPI) because it shuts down the proton pumps.

The researchers combined Omeprazole with sodium bicarbonate (baking soda), which protects the drug as it goes through the stomach, but then allows it to rapidly enter the parietal cells. The result was Zegerid.

In tests at UNMC and Missouri, the modified drug proved effective in shutting down the proton pumps and preventing ulcers in critical patients, Dr. Olsen said.

The modified version has since proved to be effective in fighting more common ailments. The pharmaceutical company Santarus purchased the rights to patent Zegerid, and in 2004, the Food and Drug Administration approved its use in treating acid reflux.

Zegerid is superior to PPIs, such as Protonix or Prilosec, that are now on the market because it works faster and



can be taken at anytime – including on an empty stomach, Dr. Olsen said.

Other PPI drugs are coated with a substance that protect them from the patient's stomach acid, and then dissolve before the drug becomes active.

"All PPIs work best when the proton pumps are activated," Dr. Olsen said. "With other drugs, patients are advised to take them about a half-hour to an hour before eating so the proton pumps will activate about the same time the drug becomes active."

This is where mother's old remedy gives Zegerid a leg up. Baking soda effectively treats upset stomachs because sodium bicarbonate neutralizes the acid in the stomach. Drs. Phillips and Olsen decided to use this property to protect the Omeprazole as it moves through the stomach.

Sodium bicarbonate also serves another function for Zegerid.

"With Zegerid, the sodium bicarbonate actually stimulates proton pump activity so the pumps are already going when the drug is released in the stomach, providing better control and more immediate relief for acid reflux than other PPIs."

With Zegerid, Drs. Phillips and Olsen provide scientific proof for the old adage that mother does indeed know best. ☺☺