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[\[Medicine\] Academia Sinica Researchers Find Link between a Cancer-causing Bacterium involved in Gastric Diseases and the Cells Lining the Stomach](#)

[Medicine] Academia Sinica Researchers Find Link between a Cancer-causing Bacterium involved in Gastric Diseases and the Cells Lining the Stomach ([Chinese Version](#))

Academia Sinica Newsletter (2009/08/20) Dr. Chun-Hung LIN and colleagues from the Institute of Biological Chemistry, Academia Sinica, have discovered an interesting and important interplay between the bacterium known to be the major cause of several gastric diseases, and the cells lining the stomach wall. Their finding was published in the well-known US scientific journal Proceedings of the National Academy of Sciences (PNAS) in August.

The bacterium *Helicobacter pylori* (*H. pylori*) inhabits the stomach and small intestine. It infects about one-half of the global human population and is commonly accepted to be the primary cause of gastritis, stomach ulcers and gastric cancer. In 1994, the International Agency for Research on Cancer together with the World Health Organization categorized *H. pylori* as a Group 1 human cancer causing agent.

Dr. LIN, in collaboration with Dr. Yu-Ju CHEN and colleagues from the Institute of Chemistry, Academia Sinica; and Dr. Ming-Hsiang WU from the Department of Internal Medicine at National Taiwan University Hospital, found that when gastric cancer cells were infected by *H. pylori*, a sugar-degrading enzyme (a specific human fucosidase named FUCA2) was released. The release affected the adhesion of *H. pylori* to the stomach wall, as well as its growth and its virulence. In addition, the researchers found that, L-fucose, the product of the fucosidase-catalyzed reaction, was transferred to *H. pylori* where it become an extra source of energy and carbon and also promoted the release of Lewis antigens (a class of oligosaccharides) on the bacteria's surface. Lewis antigens are known to be critical for the adhesion of the bacteria to host cells and are also a defense strategy used by bacteria to escape from host surveillance.

The discovery of this sugar-degrading enzyme and its interaction with *H. pylori* will now be able to be used by researchers as a target for new therapies for *H. pylori* related gastric diseases and also help in diagnosis. The current method of ridding the gut of *H. pylori* uses a combination of two to three antibiotics and a proton pump inhibitor. Due to ever-increasing concerns about antibiotic resistance, the lack of protection against re-infection, the necessity of taking a long-term prescription for complete eradication, and the high cost of this therapy, other therapeutic alternatives are urgently needed. It is thus valuable to develop fucosidase inhibitors as prophylactic drugs or adjuvants with possible therapeutic applications.

The related research article entitled "Role for α -L-fucosidase in the control of *Helicobacter pylori*-infected gastric cancer cells" can be found at:

<http://www.pnas.org/content/early/2009/08/06/0903286106.abstract?sid=0c6707f0-74fe-411b-8160-3aaaec486208>

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Related Website:

Group 1 carcinogens: <http://monographs.iarc.fr/ENG/Classification/crthgr01.php>

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