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ABSTRACT

Anti-*H. pylori* urease IgY: effective mechanism and application in controlling *H. pylori* infection in human.

Helicobacter pylori (*H. pylori*) is considered the most important cause of gastritis, gastric ulcer and stomach cancer. Recent investigations revealed that about 50% population in the world is infected with *H. pylori*. Medication with a combination of 2 antibiotics and PPI is the common therapy of *H. pylori* infection. But antibiotic therapy fails in 10-20% of cases due to the development of antibiotic resistance.

While most microbes are killed in the acidic environment in the stomach, *H. pylori* can survive and grow there because it produces a strong urease enzyme that accumulates on the surface of the bacterium. The enzyme degrades urea in foods to form ammonium and carbonic acid. This reaction increases local pH in stomach enabling the bacterium to grow. Besides, urease also functions as an adhesin to allow *H. pylori* to bind firmly on gastric mucin layer.

In our study, we extracted urease from *H. pylori* and used it as an antigen to immunize layer chickens. From the eggs laid by the immunized chickens we prepared specific antibody (IgY) and examined its efficacy against *H. pylori* on human volunteers. Various clinical trials conducted in Japan, Korea, Taiwan and Vietnam show that the IgY significantly decreased *H. pylori* number in the stomach as well as reduced gastritis symptoms in patients. When combined with antibiotics and PPI the IgY substantially enhanced the therapeutic efficacy of the drugs especially in patients having antibiotic-resistant *H. pylori*. The mechanism behind this synergetic effect will be explained.