

International Conference on Food Factors for Health
Promotion Kyoto, Japan 2007

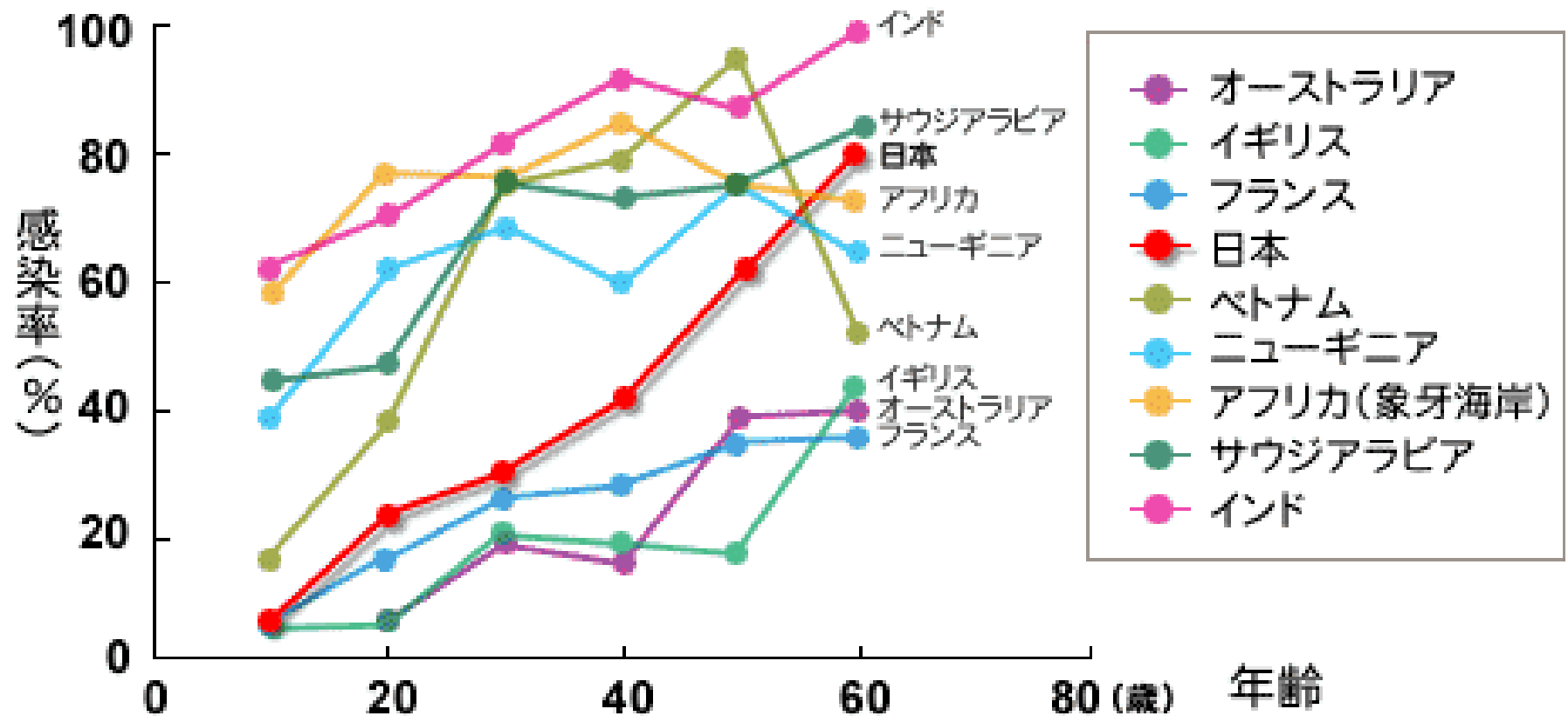
**Chicken egg yolk (IgY) as a
functional food for controlling
Helicobacter pylori infection**

Nguyen Van Sa, Ph.D

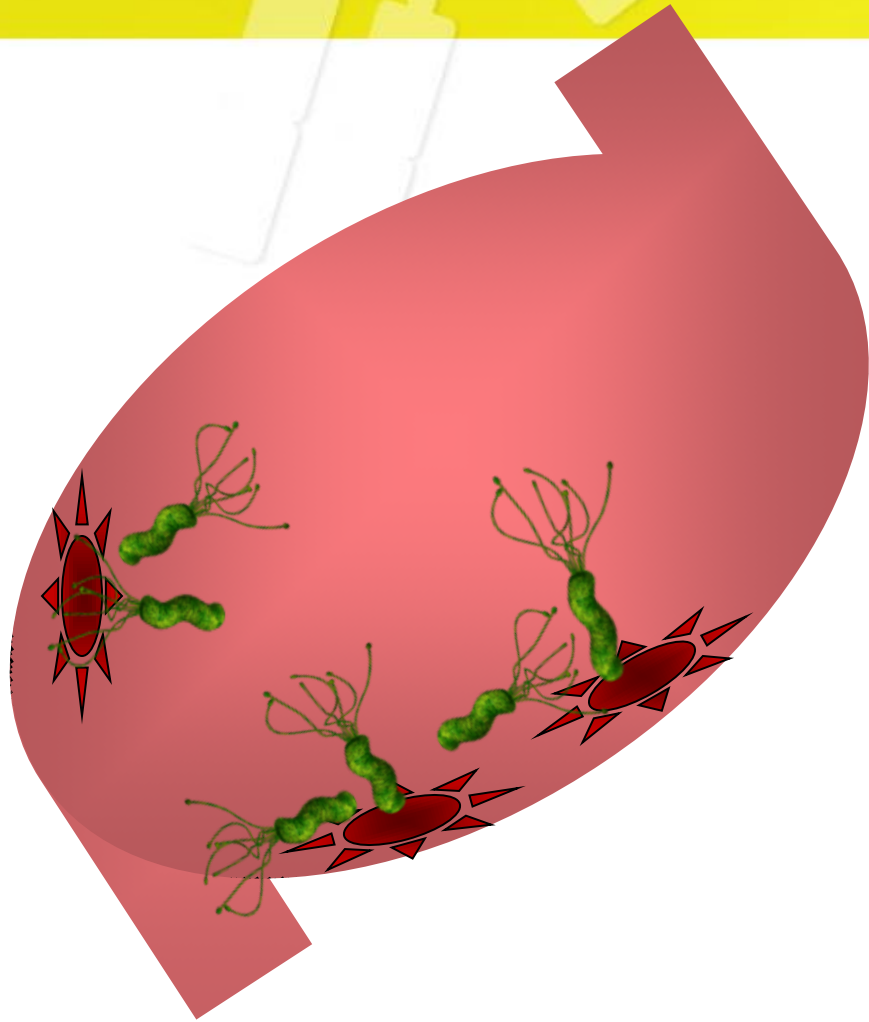
Immunology Research Institute in Gifu, Japan

H. pylori positive rate in the world

H.pyloriの年代別感染率



Helicobacter pylori is associated with



- Gastritis
- Gastric ulcer
- Duodenal ulcer
- Gastric cancer

Environment in stomach is hostile

- **Strongly acidic**
- **Peristaltic motion**

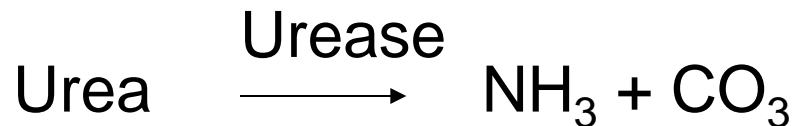



pH 2~3

It was believed that no microbes can survive in stomach. How *H. pylori* can survive and grow?

Urease plays a pivotal role

- As a strong **adhesin**: pH-dependent adherence to gastric mucin with optimal binding at pH 2.5-3.5
- As an **enzyme**: degrades urea to form NH_3 and this reaction changes local environment from acid (pH 2-3) to neutral side (pH 7)

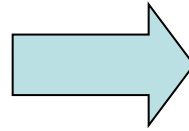
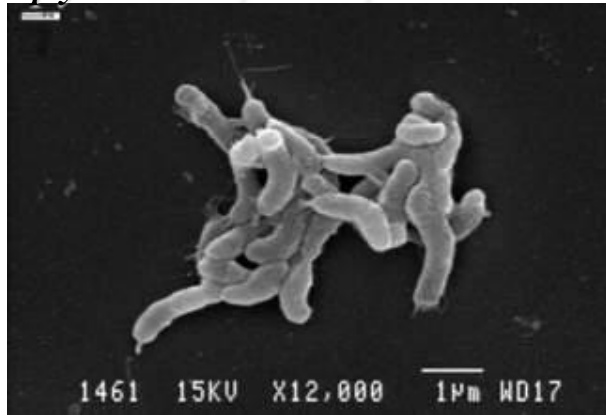




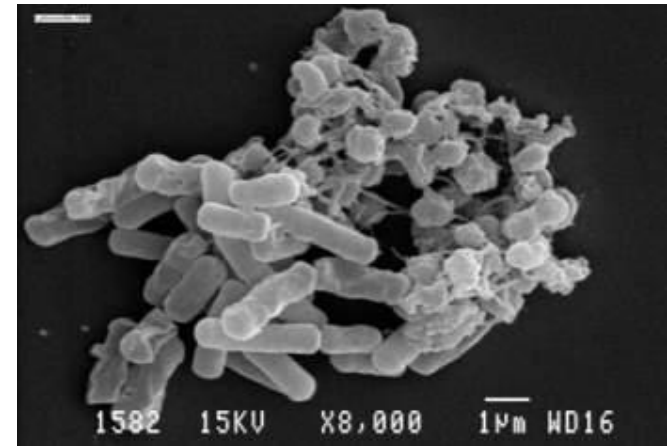
**Ovalgen HP contains specific
IgY against H. pylori urease**

Morphological change of *H.pylori*

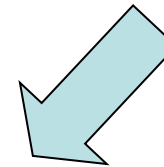
H.pylori



H.P + Lactobacilli




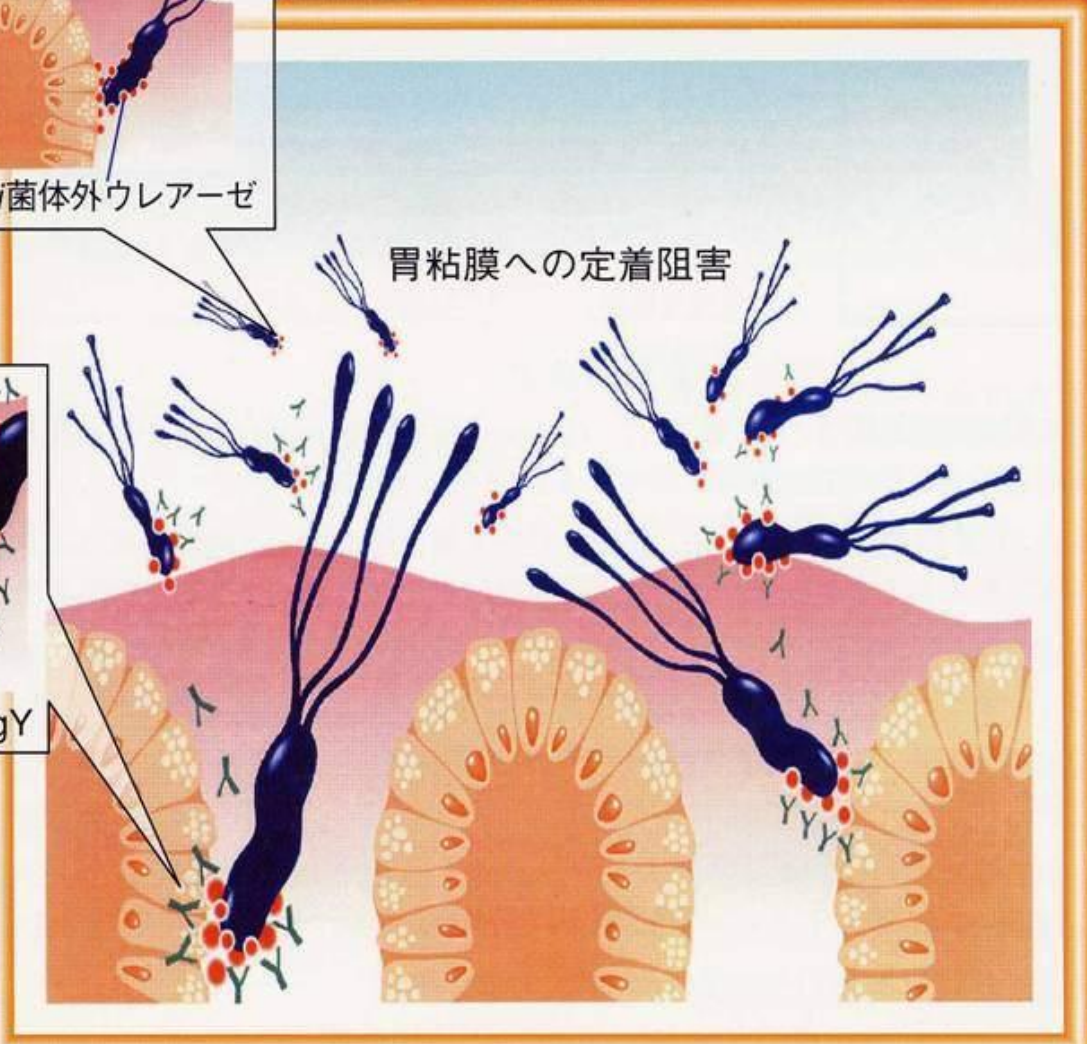
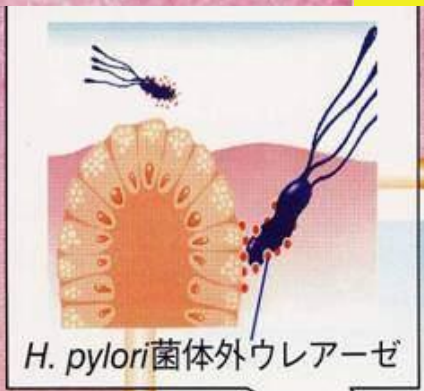
H.P + IgY + Lactobacilli



Helicobacter Research

Journal of Helicobacter

特集  *Helicobacter pylori*



Ovalgen HP: Mouse study

Materials and Methods

Animals: NS:Hr/ICR hairless mice

Test material: Ovalgen HP

Dosage: 0.25, 2.5, 25% in feed
Fed to mice ad libitum

Period: 10 weeks

Assessment: Bacterial count
in gastric tissue

Results

Treatment	Log ₁₀ CFU / 0.1g gastric tissue / mouse	Negative mouse / Total mouse
Negative control	0.00 ± 0.00	6 / 6
Positive control	3.64 ± 0.39	0 / 10
0.25% Ovalgen HP	3.08 ± 0.79	0 / 10
2.5% Ovalgen HP	1.26 ± 1.47**	5 / 10 [#]
25% Ovalgen HP	0.94 ± 1.53**	7 / 10 ^{##}

**; p<0.01 compared to positive control group value, T test

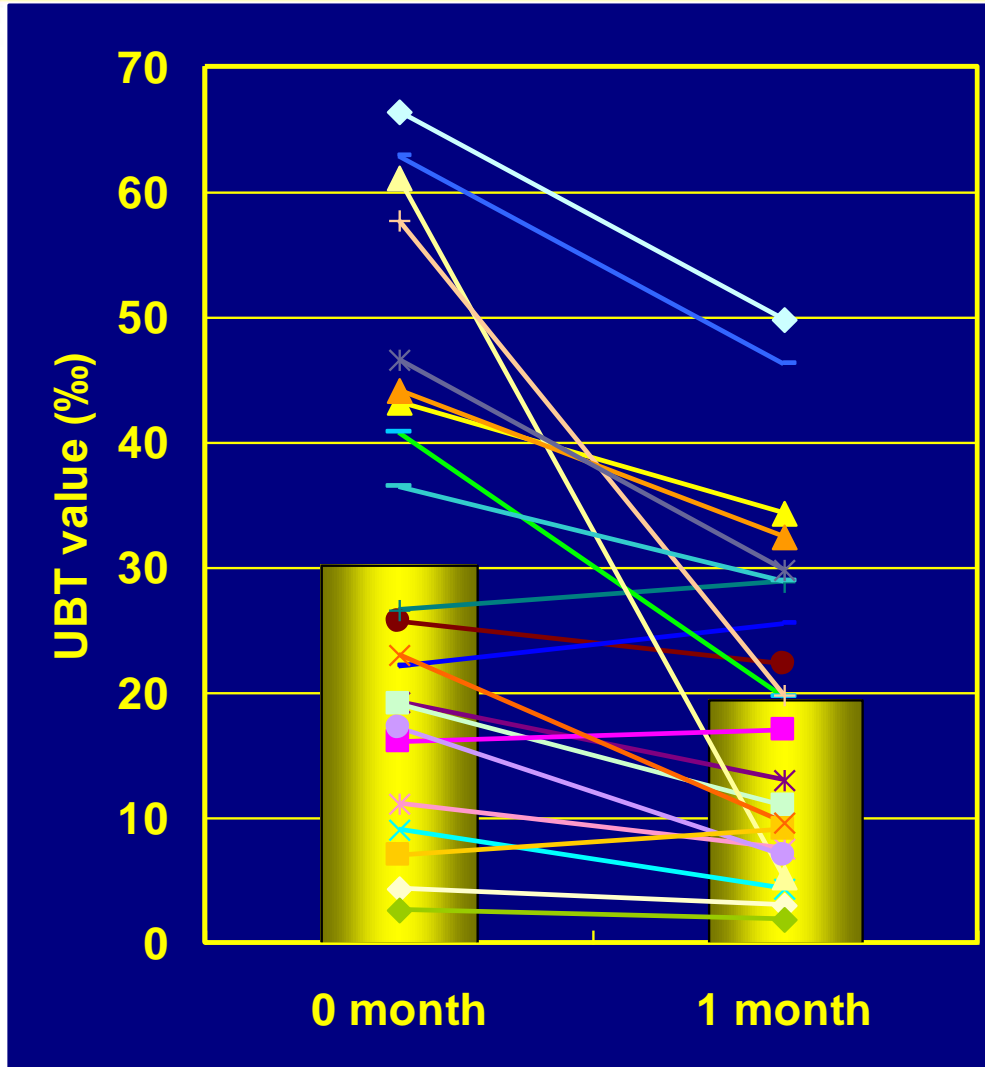
#, ##; p<0.05 and 0.01 compared to positive control group, chi-square test

Volunteer study

(Test 1)

Volunteers:	22 volunteers (H.pylori – positive)
Test material:	Ovalgen HP (DYP)
Dosage:	1.5g / day
Period:	1 month
Assessment:	UBT (0, 1 month)

Result



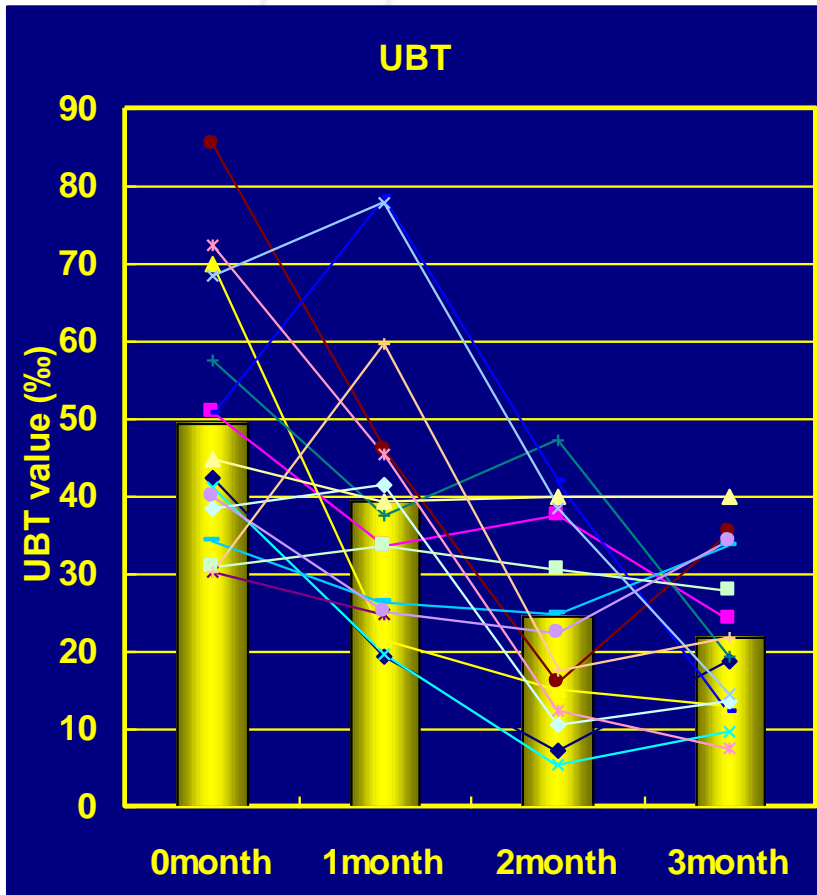
P < 0.01

Volunteer study

(Test 2)

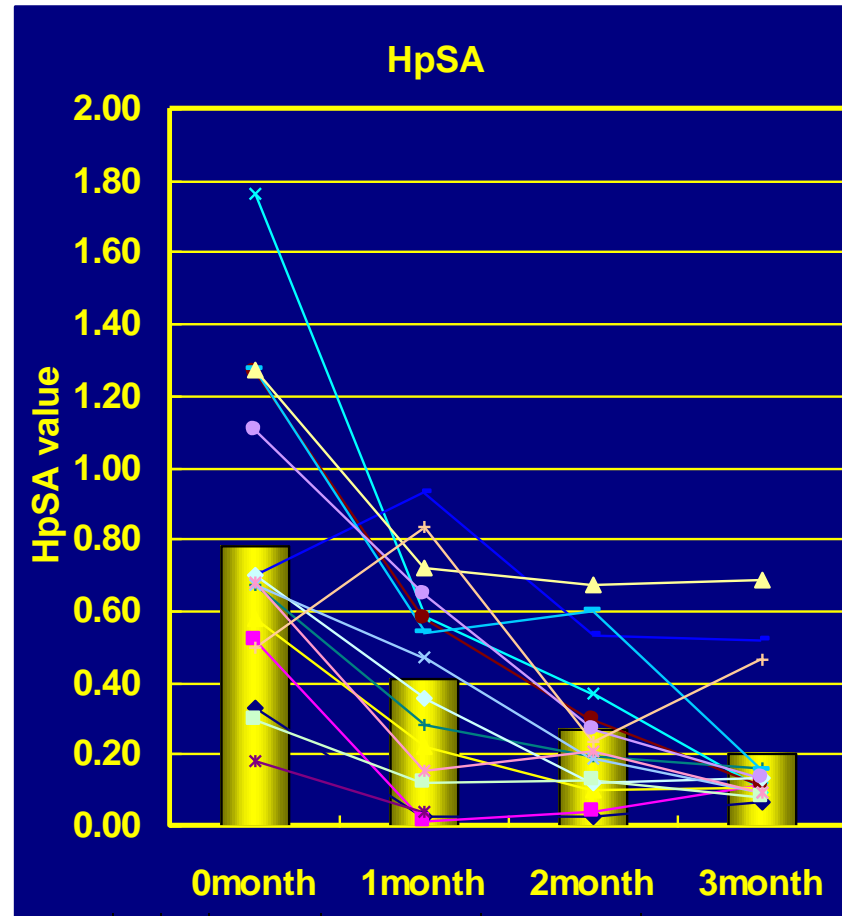
- Volunteers: 16 volunteers (H.pylori positive by UBT)
- Test material: Yogurt containing 2.0g of Ovalgen HP (Yolk liquid)
- Dosage: 2 cups of yogurt / day
- Period: 3 month
- Assessment: UBT & HpSA (0, 1, 2, 3 month)

Results



P<0.001

P<0.001



P<0.005

P<0.001

P<0.001

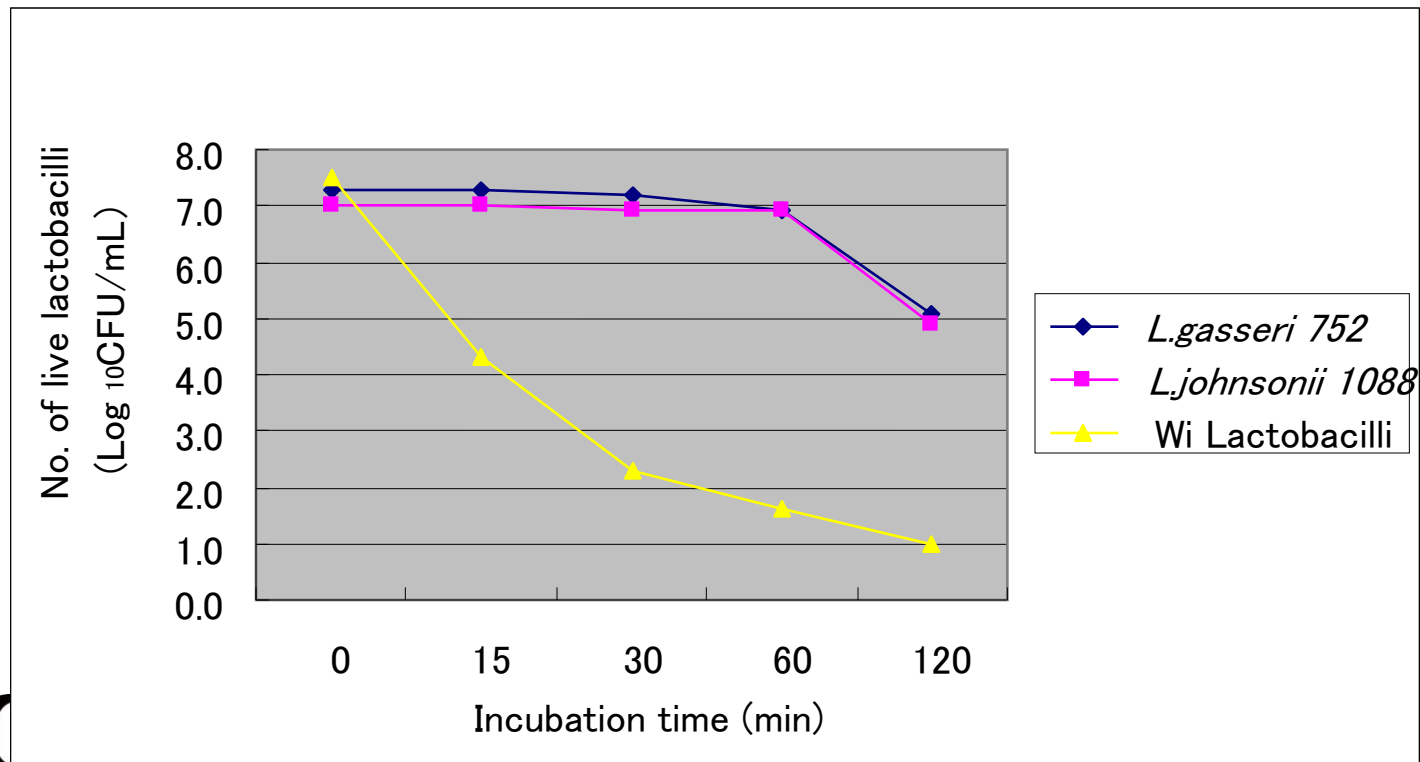
Synergetic effect of Ovalgen HP and Lactobacillus

- Probiotics are known to inhibit growth of H.pylori.
- But most probiotic strains are not resistant against acid and so are easily killed in the stomach. Selection of acid-resistant probiotic strains are the key to success.
- Our L. gasseri strain GL 752 (developed by Tokai University) is highly resistant to acid.

Test of the resistance to acid (1)

(In 0.1M HCl - Sodium citrate buffer solution ; pH 1.5)

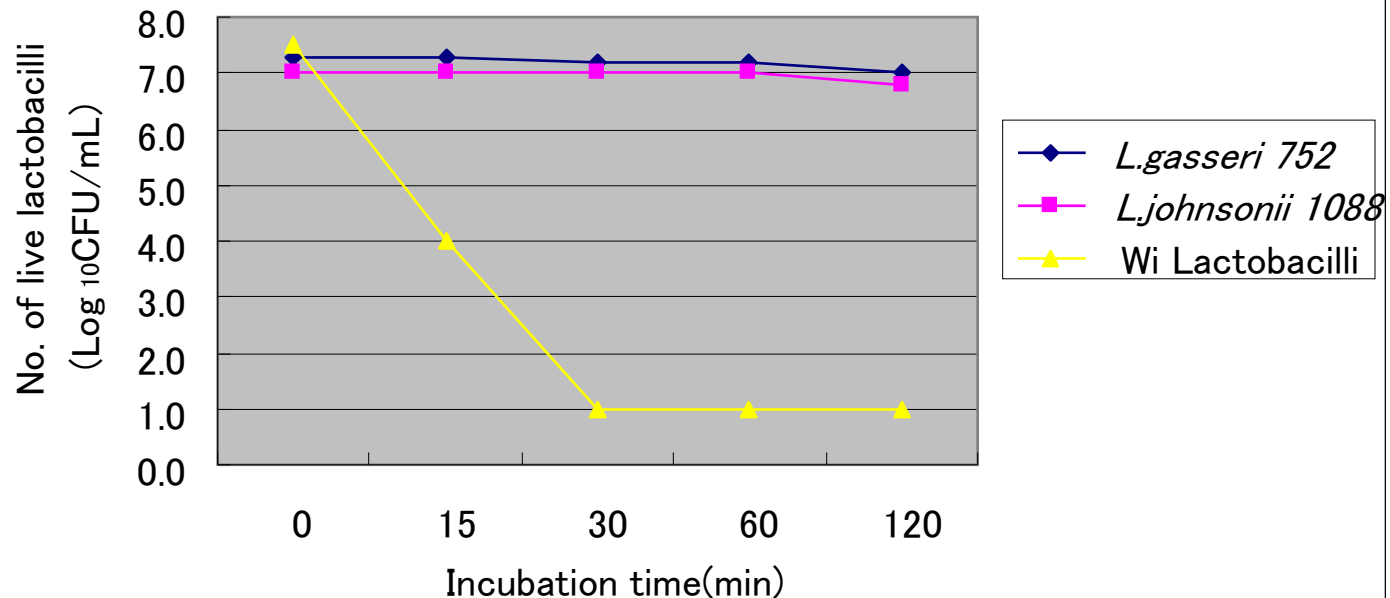
Incubation time (min)	No. of the survived lactobacilli (Log ₁₀ CFU/mL)				
	0	15	30	60	120
<i>L.gasseri</i> LG752	7.3	7.3	7.2	6.9	5.1
<i>L.johnsonii</i> 1088	7.0	7.0	6.9	6.9	4.9
Wi Lactobacilli	7.5	4.3	2.3	1.6	1.0



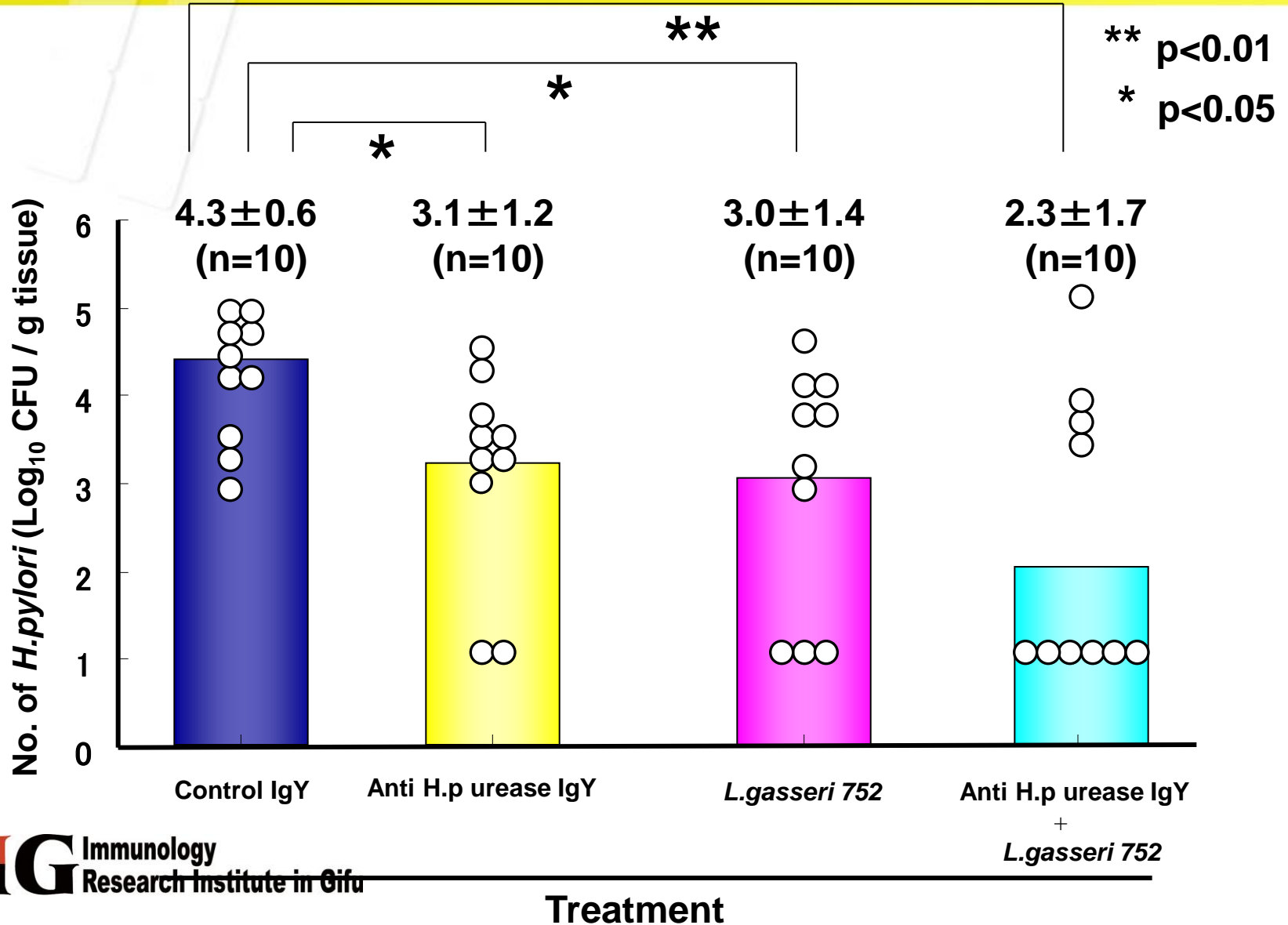
Test of the resistance to acid (2)

(In 0.1M HCl - Sodium citrate buffer solution ; pH 2.0)

Incubation time (min)	No. of the survived lactobacilli (Log ₁₀ CFU/mL)				
	0	15	30	60	120
<i>L.gasseri</i> LG752	7.3	7.3	7.2	7.2	7.0
<i>L.johnsonii</i> 1088	7.0	7.0	7.0	7.0	6.8
Wi Lactobacilli	7.5	4.0	1.0	1.0	1.0



Number of *H.pylori* in the stomach of mice after treatment with IgY and / or *L.gasseri* No.752



Yogurts containing Ovalgen HP



Dr. Piro by Glico