

LumiQuick
DIAGNOSTICS, INC.

QuickProfile™ **HELICOBACTER PYLORI ANTIGEN TEST**

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Cat.# 71020

Immunochromatographic rapid assay for the Detection of *Helicobacter pylori* Antigens in Human Stool Specimens

INTENDED USE

QuickProfile™ *H. pylori* Antigen Test is an *in vitro* qualitative immunochromatographic assay for the rapid detection of *Helicobacter pylori* antigens in human stool specimen. This test is intended to aid in the diagnosis of *H. pylori* infection, to monitor the effectiveness of therapeutic treatment and to confirm the eradication of *H. pylori* in peptic ulcer patients.

INTRODUCTION

Helicobacter pylori is a corkscrew-shaped, gram-negative rod that lives in the mucous layer of the stomach. *H. pylori* infection is now accepted as the most common cause of gastritis, and is etiologically involved in gastric ulcer, duodenal ulcer, gastric adenocarcinoma and primary gastric B-cell lymphoma.^{1,2}

The organism is very common, infecting at least half of the world's population. *H. pylori* infection is typically acquired in childhood. Once acquired, infection persists chronically, probably continuing in the stomach throughout life. The damage to gastric structure and function of stomach is constant and direct. Approximately one in six of *H. pylori* infections develop peptic ulcer disease and a small portion of *H. pylori* infection leads to gastric cancer.³

The diagnostic tests for *H. pylori* can be classified into two categories: Invasive and Noninvasive tests. Direct detection by invasive test procedures requires an endoscopy and biopsy specimens from antrum and stomach body.⁴ The presence of *H. pylori* is then confirmed by direct culture, histological examination or rapid urease test. The endoscopy and biopsy specimens offer direct detection of active *H. pylori* infections. Although the procedure is highly specific and high positive predictive value, the cost and discomfort to the patients are very high.

The most widely available noninvasive test is probably the serological based test. The serology test detects *H. pylori* specific IgG antibody in patient serum with current or prior infection.^{5,6} Serology test is a simple, convenient test with relative high sensitivity. The main limitation of serology test is the inability to distinguish current and past infections. Antibody may be present in the patient's serum long after eradication of the organism.⁶ The urease breath test (UBT) with ¹⁴C or ¹³C labeled urea, is a noninvasive test based on the urease activity of the organism. UBT detects active *H. pylori* infection and is highly sensitive and specific. The UBT requires a high density and active bacteria and should not be performed until 4 weeks after therapy to allow residual bacterial to increase to a sufficient number for detection.⁷

QuickProfile™ *H. pylori* Antigen Test is an immunochromatographic assay that uses antibody-coated colloidal gold to detect the presence of *H. pylori* antigens in stool

specimens. The test detects directly antigens in specimens for an active infection. The test is simple and easy to perform and the test results can be visually interpreted within 10 minutes

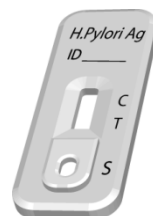
PRINCIPLE OF THE TEST

QuickProfile™ *H. pylori* Antigen Test is a sandwich solid phase immunochromatographic assay. To perform the test, an aliquot of diluted stool sample is added to the sample well of the test cassette. The sample flows through a label pad containing *H. pylori* antibody coupled to red-colored colloidal gold. If the sample contains *H. pylori* antigens, the antigen will bind to the antibody coated on the colloidal gold particles to form antigen-antibody-gold complexes. These complexes move on the nitrocellulose membrane by capillary action toward the test line region on which *H. pylori* specific antibodies are immobilized. As the complexes reach the test line, they will bind to the antibody on the membrane in the form of a line. A second red control line will always appear in the result window to indicate that the test has been correctly performed and the test device functions properly. If *H. pylori* antigen is not present or lower than the detection limit of the test, only the control line will be visible. If the control line does not develop, the test is invalid.

MATERIALS PROVIDED

1. QuickProfile™ *H. Pylori* Antigen test card

Each cassette contains a test strip with *H. pylori* specific antibody on the test region of the membrane and colored *H. pylori* antibody-gold conjugate pad.



**H. Pylori Antigen
Test Card**



Sample bottle

2. Sample bottle

Each sample bottle contains 1.5 ml of stool specimen collection buffer. Store at 4-30°C

MATERIALS NOT PROVIDED

1. Specimen collection container
2. Timer.

WARNINGS AND PRECAUTIONS

1. For *in vitro* diagnostic use.
2. Wear protective glove while handling kit components and test specimens.
3. Patient specimens and inactivated Positive Control may contain infectious agents and should be handled and disposed of as potential biohazards.
4. Do not use kit components beyond expiration date.
5. Dispose all used materials in appropriate container. Treat as potential biohazard.

STORAGE INSTRUCTION

1. The expiration date is indicated on the package label.
2. Sample Collection Tubes without introducing the sample can be stored at 4-30°C.
3. Test device can be stored at 4-30 °C.

SPECIMEN COLLECTION AND STORAGE

Stool specimens should be collected in containers that do not contain media, preservatives, animal serum or detergents as any of these additives may interfere with the QuickProfile™ H. pylori Antigen Test.

Specimens may be stored at 2-8°C for 3 days without interfering with the assay performance. For long-term storage of specimens, -20°C or colder is recommended. Repeated freezing and thawing of specimens is not recommended and may cause erroneous results. Do not store specimens in self-defrosting freezers.

REAGENT PREPARATION

Bring all reagents, including test device, to room temperature before use.

SPECIMEN PREPARATION

1. Unscrew the sample bottle, use the attached applicator stick attached on the cap to transfer small piece of stool (5-6 mm in diameter; approximately 100 mg – 200 mg/0.1-0.2 g) into the sample bottle containing specimen preparation buffer.
2. Replace the stick in the bottle and tighten securely. Mix stool sample with the buffer thoroughly by shaking the bottle for a few seconds.

Note: Watery or diarrhea specimens are inappropriate for testing.

PROCEDURE

1. Bring all materials and specimens to room temperature.
2. Remove the test card from the sealed foil pouch.
3. Hold the sample bottle upright with the tip pointed away from the test performer, snap off the tip.
4. Hold the bottle in a vertical position over the sample well of the test card, deliver 3 drops (120 -150 µL) of diluted stool sample to the sample well.
5. Read the result within 10 to 15 minutes. A strong positive sample may show result earlier.

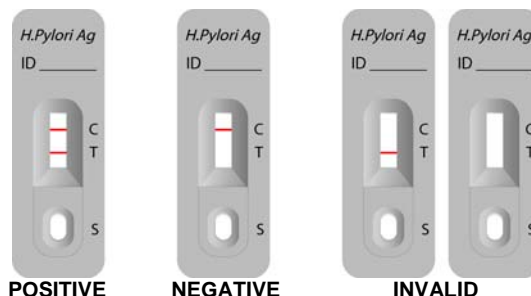
Test results after 15 minutes may not be accurate.

INTERPRETATION OF RESULTS

Positive result: A distinct pink colored band appears on test line regions, in addition to a pink line on the control line region.

Negative result: No line appears in the test line region. A distinct pink line shows on the control line region.

Invalid: The control line next to the test line does not become visible within 10 minutes after the addition of the sample.



QUALITY CONTROL

1. The control band is an internal reagent and procedural control. It will appear if the test has been performed correctly and the reagents are reactive.
2. Good Laboratory Practice recommends the daily use of control materials to validate the reliability of the device. Control materials are not provided with this test kit but may be commercially available.

LIMITATIONS

1. The test is for qualitative detection of H. pylori antigen in stool sample and does not indicate the quantity of the antigens.
2. The test is for *in vitro* diagnostic use only.
3. The test result should be used only to evaluate with patient with signs and symptoms of gastrointestinal disease. A definitive clinical diagnosis should only be made by the physician after all clinical and laboratory findings have been evaluated.

EXPECTED VALUES

Helicobacter pylori infects more than half the people in the world.⁹ The prevalence of the infection varies among countries and among different groups within the same country.¹⁰ The prevalence rate in the United State suggests an incidence of infection of 2%. The lifetime prevalence of peptic ulcer disease is about 12% in men and 9% in women.¹¹ Studies have found that more than 90% of patients with duodenal ulcer and 80% of patients with gastric ulcer are infected with *H. pylori*.^{12,13}

QuickProfile™ H. pylori Antigen Test detects the presence of *H. pylori* antigens in stool specimens. Expected values for any given population should be determined for each laboratory. The positivity rate of any given laboratory may vary depending on geographic location, ethnic group, and living environment.

PERFORMANCE CHARACTERISTICS

Accuracy

QuickProfile™ *Helicobacter pylori* Antigen Test was evaluated on 1049 stool samples. The test results were compared with an approved predicate kit.

		Predicate Kit		Total
		Pos.	Neg.	
QuickProfile™ H.Pylori Ag Test	Pos.	508	11	519
	Neg.	5	525	530
Total		513	536	1049

Out of five hundred and thirteen (513) samples that were tested positive by the predicate kit, five hundred and eight (508) were positive on QuickProfile™ H. Pylori Antigen Test. Out of five hundred and thirty six (536) samples that were tested negative by the predicate kit, five hundred and twenty five (525) were negative on QuickProfile™ H. Pylori Antigen Test. Sixteen (16) samples that had disparity in results were verified by ELISA. Seven (7) samples had results in agreement with QuickProfile™ H. Pylori Antigen Test while nine (9) samples agreed with the predicate kit. The agreement with the predicate kit is summarized as below.

Agreement of positive = 508/513 = 99.03%
 Agreement of Negative = 525/536 = 97.95%
 Total Agreement = 1033/1049 = 98.47%

Assay Specificity

Following bacterial and viral strains were used to test the specificity of QuickProfile™ H. pylori Antigen Test. Positive and negative controls spiked with the bacteria or virus at the indicated concentration showed no interference on the test results.

Adenovirus type 40	1x10 ⁶ TCID ₅₀
Adenovirus type 41	1x10 ⁶ TCID ₅₀
Rotavirus Wa	1x10 ⁶ TCID ₅₀
Campylobacter jejuni	7.63 x 10 ⁷ CFU/ml
Candida albicans	1x10 ⁸ CFU/ml
Clostridium perfringens A	1x10 ⁸ CFU/ml
Citrobacter freundii	1x10 ⁸ CFU/ml
Enterococcus faecalis	1x10 ⁸ CFU/ml
Escherichia coli	1x10 ⁸ CFU/ml
Klebsiella pneumonia	1x10 ⁸ CFU/ml
Listeria monocytogenes	1x10 ⁸ CFU/ml
Moraxella catarrhalis	9.9x10 ⁶ CFU/ml
Neisseria gonorrhoeae	1x10 ⁸ CFU/ml
Pseudomonas aeruginosa	1x10 ⁸ CFU/ml
Staphylococcus epidermidis	1x10 ⁸ CFU/ml
Staphylococcus aureus	1x10 ⁸ CFU/ml
Shigella flexneri	1x10 ⁸ CFU/ml
Shigella sonnei	1x10 ⁸ CFU/ml
Streptococcus dysgalactiae	1x10 ⁸ CFU/ml
Streptococcus agalactiae	1x10 ⁸ CFU/ml
Streptococcus pyogenes	1x10 ⁸ CFU/ml

REFERENCES

1. Marshall, B.J. and Warren, J.R. Unidentified curved bacilli in the stomach of patients with gastric and peptic ulceration. *Lancet* 1984; 1311-1314.
2. Graham K.S and Graham D.Y. 1999. Contemporary Diagnosis and Management of *H. pylori*-Associated Gastrointestinal Diseases, Handbooks in Health Care Co., Newtown, PA., 1999: 39-67.
3. Howden C.W. Clinical expressions of *Helicobacter pylori* infection. *Am J Med*; 1996;100:27S-33S.
4. El-Zimaity HM, Al-Assi MT, Genta RM, Graham DY. Confirmation of successful therapy of *Helicobacter pylori* infection: number and site of biopsies or a rapid urease test. *Am J Gastroenterol*. 1995;90:1962-1964.

5. Talley NJ, Newell DG, Ormand JE, et al. Serodiagnosis of *Helicobacter pylori*: Comparison of enzyme-linked immunosorbent assays. *J. Clin Microbiol*. 1991;29:1635-1639.
6. Cutler AF. Testing for *Helicobacter pylori* in clinical practice. *Am J. Med*. 1996;100:35S-41S.
7. Klein PD, Malaty HM, Martin RF, et al. Noninvasive detection of *Helicobacter pylori* infection in clinical practice: the ¹³C urea breath test. *Am J. Gastroenterol*. 1996;91:690-694.
8. National Committee for Clinical Laboratory Standards. Internal quality control: Principles and definitions; Approval Guideline, NCCLS document C24-A (NCCLS, 771 East Lancaster Ave, Vallanova, PA 19085, 1991).
9. Marshall BJ. *JAMA*. 1995;274:1064-1066
10. Breuer T, Malaty HM, Graham DY. The epidemiology of *H. pylori*-associated gastroduodenal diseases. In: Ernst PB, Michetti P, Smith PD, eds. The Immunobiology of *H. pylori*: From Pathogenesis to Prevention. Philadelphia. Lippincott-Raven, 1997:1-14.
11. Graham DY, Malaty HM, Evans DG, Evans, Jr. DJ, Klein PD, and Adam E. Epidemiology of *Helicobacter pylori* in a asymptomatic population in the United States. Effect of age, race, and socioeconomic status. *Gastroenterology*, 1991;100:1495-1501.
12. Anand BS, Raed AK, Malaty HM, et al. Low point prevalence of peptic ulcer in normal individual with *Helicobacter pylori* infection. *Am J Gastroenterol*. 1996;91:1112-1115.
13. Tytgat GNJ, Noach LA, Rauws EAJ. *Helicobacter pylori* infection and duodenal ulcer disease. *Gastroenterol Clin North Am*. 1993;22:27-139.



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