

MAY 12 1998

510(k) Summary

K980076

Identification Information

Submitter's Information:

Submitter's Name and Address:

Meridian Diagnostics, Inc.
River Hills Drive
Cincinnati, OH 45244

Phone Number: 1-800-543-1980

Contact Person: Allen D. Nickol, PhD
Director of Scientific and Regulatory Affairs

Date Summary Prepared: May 5, 1998

Name of Device: Premier Platinum HpSA.

Classification Name:

Campylobacter pylori, 83LYR

Predicate Equivalent Device:

CLOtest, rapid urease test for biopsy specimens.

Description of Device:

The **Premier Platinum HpSA** test utilizes polyclonal anti-*H. pylori* capture antibody adsorbed to microwells. Diluted patient samples and a peroxidase conjugated polyclonal antibody are added to the wells and incubated for one hour at room temperature. A wash is performed to remove unbound material. Substrate is added and incubated for ten minutes at room temperature. Color develops in the presence of bound enzyme. Stop solution is added and the results are interpreted visually or spectrophotometrically.

Intended Use:

The Premier Platinum HpSA enzyme immunoassay (EIA) is an *in vitro* qualitative procedure for the detection of *Helicobacter pylori* antigens in human stool. Test results are intended to aid in the diagnosis of *H. pylori* infection in adult patients.

Comparison with Predicate Devices:

The following comparison of the use, technology, function and performance supports the Statement of Equivalence between the Premier Platinum HpSA test and the CLO test. The differences in technology does not raise additional concerns regarding safety and effectiveness. Safety and effectiveness are demonstrated to be substantially equivalent.

Method	Premier HpSA	Rapid Urease
Intended Use	Detection of <i>H. pylori</i> antigens in patient stool	Detection of <i>H. pylori</i> associated urease activity in biopsy specimens
Results	Qualitative	Qualitative
Specimen Required	Stool	Gastric or Duodenal biopsy
Technology	Sandwich Enzyme Immunoassay	<i>H. pylori</i> urease catalyzed pH change visualize by color change indicator
Level of Skill Required	Laboratory Technician	Gastroenterologist for biopsy and laboratory technician for reading result and QA.
Function	<ol style="list-style-type: none"> 1. Specimen diluted 1/3 and added to well containing rabbit anti-<i>H. pylori</i> capture Ab. 2. One drop HRP-conjugated detection Ab added. 3. Incubation 1 hr at room temperature. 4. Wash 5 times. 5. Add 2 drops substrate. 6. Incubate 10 minutes at room temperature. 7. Add one drop stop solution and read visually or spectrophotometrically 	<ol style="list-style-type: none"> 1. Biopsy specimen place in device and incubated at 30-40°C for 3 hours. The keep at room temperature up to 24 hours. 2. Read results for visual color change. Negatives at 24 hours if still yellow. Positive turn pink, orange or magenta.
Interpretation	Pos/Neg read visually or spectrophotometrically. Fixed cutoff 0.140 single wavelength (450nm) or 0.100 dual wavelength (450-630nm)	Pos/Neg
Performance vs. Reference Methods		

Method	Premier HpSA	Rapid Urease
Sensitivity	96.2% (90.4-98.9%)	95.4% (89.6-98.5%)
Specificity	95.7% (89.5-98.8%)	100.0% (96.4-100.0%)
Correlation	96.0% (92.2-98.2%)	97.6% (94.5-99.2%)

Performance Characteristics:

The Premier Platinum HpSA test was evaluated on 200 symptomatic adults at one midwestern United States location, one site in Canada, and two sites in Italy. The patients studied had a wide cross-section of gastric pathologies noted, including: antral gastritis (n=81), antral gastropathy (n=25), antral erosions (n=24), esophagitis (n=21), duodenal ulcer (n=15), erosive duodenitis (n=10), GERD (n=10), "normal" (n=10), duodenitis (n=9), gastric ulcer (n=8), total stomach gastritis (n=6), hiatal hernia (n=6), Schatzki's ring (n=4), pyloric ulcer (n=2), and esophageal ulcer (n=1). HpSA test results were compared to diagnosis of *H. pylori* infection as judged by objective reference methods (culture, rapid urease, histology and UBT). Patients were considered positive if culture was positive, or if two or more of the other three tests were positive. Nine patients with negative or no culture results, and only one other test positive, were considered unevaluable. The HpSA test was 96.1% sensitive, 95.7% specific and showed 95.9% correlation with *H. pylori* infection. Confidence intervals were calculated by the exact binomial method.

Trial Site #1

Test		Diagnosis		Sensitivity	Specificity	Positive PV	Negative PV	Correlation
Method	Result	Infected	Not Infected	± 95% CI				
HpSA	Pos	17	5	94.4%	91.4%	85.0%	97.0%	92.5%
EIA	Neg	1	32	72.7 to 99.9%	76.9 to 98.2%	62.1 to 96.8%	84.2 to 99.9%	81.8 to 97.9%
	Equ	0	0					

Reference Methods: Histology, Rapid Urease, Breath Test. Readings Single and Dual Wavelength.

Trial Site #2

Test		Diagnosis		Sensitivity	Specificity	Positive PV	Negative PV	Correlation
Method	Result	Infected	Not Infected	± 95% CI				
HpSA	Pos	9	0	100.0%	100.0%	100.0%	100.0%	100.0%
EIA	Neg	0	8	66.4 to 100.0%	63.1 to 100.0%	66.4 to 100.0%	63.1 to 100.0%	80.5 to 100.0%
	Equ	0	0					

Reference Methods: Histology, Rapid Urease, Culture, Breath Test. Readings Single and Dual Wavelength.

Trial Site #3

Test		Diagnosis		Sensitivity	Specificity	Positive PV	Negative PV	Correlation
Method	Result	Infected	Not Infected	± 95% CI	± 95% CI	± 95% CI	± 95% CI	± 95% CI
HpSA	Pos	44	0	97.8%	100.0%	100.0%	96.0%	98.6%
EIA	Neg	1	24	88.2 to 99.9%	85.8 to 100.0%	92.0 to 100.0%	79.6 to 99.9%	92.2 to 100.0%
	Equ	1	0					

Reference Methods: Histology, Rapid Urease, Culture, Breath Test. Readings Single Wavelength.

Trial Site #4

Test		Diagnosis		Sensitivity	Specificity	Positive PV	Negative PV	Correlation
Method	Result	Infected	Not Infected	± 95% CI				
HpSA	Pos	29	1	93.5%	96.3%	96.7%	92.9%	94.8%
EIA	Neg	2	26	78.6 to 99.2%	81.0 to 99.9%	82.8 to 99.9%	76.5 to 99.1%	85.6 to 98.9%
	Equ	2	0					

Reference Methods: Histology, Rapid Urease. Readings Dual Wavelength.

Compiled Data From All Sites

Test		Diagnosis		Sensitivity	Specificity	Positive PV	Negative PV	Correlation
Method	Result	Infected	Not Infected	± 95% CI				
HpSA	Pos	99	4	96.1%	95.7%	96.1%	95.7%	95.9%
EIA	Neg	4	90	90.4 to 98.9%	89.5 to 98.8%	90.4 to 98.9%	89.5 to 98.8%	92.2 to 98.2%
	Equ	3	0					

Additional Information/Non-clinical Test Results:

Reproducibility:

Reproducibility of the Premier Platinum HpSA test was determined using negative (n=2), low positive (n=2), medium positive (n=2) and high positive (n=1) samples tested in triplicate in three separate batches / runs at each of two separate sites. Intra- and inter-assay coefficients of variation were determined and are presented below (ranges are the results from two different specimens):

	Intra-Assay Reproducibility: Read at	Inter-Assay Reproducibility: Read at
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Specimen Type	450nm	450-630nm	Visible	450nm	450-630nm	Visible
Negative	4.3% - 5.1%	8.1% - 13.5%	100%	10.6% - 13.2%	51.0% - 57.5%	100%
Low Positive	9.2% - 14.8%	11.0% - 16.6%	100%	15.3% - 27.9%	18.0% - 32.9%	100%
Medium Positive	8.8% - 9.0%	9.6% - 9.6%	100%	17.6% - 19.3%	19.7% - 19.7%	100%
High Positive	11.2%	11.6%	100%	19.8%	20.0%	100%
Negative Control	6.2%	20.2%	100%	15.3%	60.2%	100%
Positive Control	2.2%	1.9%	100%	22.8%	23.9%	100%

Frozen Stools:

Samples were tested on day 0, then put through four freeze / thaw cycles, being tested each time. The data supports four freeze / thaw cycles.

Cross-Reactivity:

The specificity of Premier Platinum HpSA was tested by utilizing the following bacterial or viral strains. Positive and negative stools were spiked with $\geq 1 \times 10^8$ organisms / ml and tested by Premier Platinum HpSA. *H. pylori* gave a positive result when tested. All organisms were found to be negative when spiked into the negative stool. In addition, they did not interfere with the positive specimen:

Microorganism or virus (# strains tested)

- | | |
|------------------------------------|---|
| <i>Adenovirus Type II</i> (1) | <i>Rotavirus</i> (1) |
| <i>Campylobacter coli</i> (1) | <i>Mycobacterium smegmatis</i> (1) |
| <i>Campylobacter fetus</i> (1) | <i>Nocardia asteroides</i> (1) |
| <i>Campylobacter jejuni</i> (1) | <i>Proteus vulgaris</i> (1) |
| <i>Campylobacter lari</i> (1) | <i>Salmonella</i> (Group B) (1) |
| <i>Candida albicans</i> (1) | <i>Salmonella dublin</i> (1) |
| <i>Citrobacter freundii</i> (1) | <i>Salmonella hilversum</i> (Group N) (1) |
| <i>Clostridium difficile</i> (2) | <i>Salmonella minnesota</i> (1) |
| <i>Clostridium perfringens</i> (2) | <i>Salmonella typhimurium</i> (1) |
| <i>Enterococcus faecalis</i> (1) | <i>Serratia liquefaciens</i> (1) |
| <i>Enterobacter cloacae</i> (1) | <i>Shigella boydii</i> (1) |
| <i>Escherichia coli</i> (2) | <i>Shigella dysenteriae</i> (1) |
| <i>Escherichia fergusonii</i> (1) | <i>Shigella flexneri</i> (1) |

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Response Items, Round 2: K980076
Premier Platinum HpSA

<i>Escherichia hermannii</i> (1)	<i>Shigella sonnei</i> (1)
<i>Helicobacter cinaedi</i> (1)	<i>Staphylococcus aureus</i> (1)
<i>Helicobacter mustelae</i> (1)	<i>Staphylococcus aureus</i> (Cowan I) (1)
<i>Klebsiella pneumoniae</i> (1)	<i>Staphylococcus epidermidis</i> (1)
<i>Providencia stuartii</i> (1)	<i>Streptococcus agalactiae</i> (1)
<i>Pseudomonas aeruginosa</i> (1)	<i>Streptococcus faecalis</i> (1)
<i>Pseudomonas fluorescens</i> (2)	<i>Yersinia enterocolitica</i> (2)

Interfering Substances:

None



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Food and Drug Administration
2098 Gaither Road
Rockville MD 20850

Dr. Allen D. Nickol
Meridian Diagnostics, Inc.
Director, Scient. & Reg. Affairs
3471 River Hills Drive
Cincinnati, Ohio 45244

Re: K980076
Trade Name: Premier Platinum HpSA
Regulatory Class: I
Product Code: LYR
Dated: April 8, 1998
Received: April 9, 1998

Dear Dr. Nickol:

We have reviewed your Section 510(k) notification of intent to market the device referenced above and we have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration.

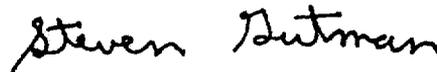
If your device is classified (see above) into either class II (Special Controls) or class III (Premarket Approval), it may be subject to such additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 895. A substantially equivalent determination assumes compliance with the current Good Manufacturing Practice requirement, as set forth in the Quality System Regulation (QS) for Medical Devices: General regulation (21 CFR Part 820) and that, through periodic (QS) inspections, the Food and Drug Administration (FDA) will verify such assumptions. Failure to comply with the GMP regulation may result in regulatory action. In addition, FDA may publish further announcements concerning your device in the Federal Register. Please note: this response to your premarket notification submission does not affect any obligation you might have under sections 531 through 542 of the Act for devices under the Electronic Product Radiation Control provisions, or other Federal laws or regulations.

Under the Clinical Laboratory Improvement Amendments of 1988 (CLIA-88), this device may require a CLIA complexity categorization. To determine if it does, you should contact the Centers for Disease Control and Prevention (CDC) at (770)488-7655.

This letter will allow you to begin marketing your device as described in your 510(k) premarket notification. The FDA finding of substantial equivalence of your device to a legally marketed predicate device results in a classification for your device and thus, permits your device to proceed to the market.

If you desire specific advice for your device on our labeling regulation (21 CFR Part 801 and additionally 809.10 for in vitro diagnostic devices), please contact the Office of Compliance at (301) 594-4588. Additionally, for questions on the promotion and advertising of your device, please contact the Office of Compliance at (301) 594-4639. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR 807.97). Other general information on your responsibilities under the Act may be obtained from the Division of Small Manufacturers Assistance at its toll-free number (800) 638-2041 or at (301) 443-6597, or at its internet address "<http://www.fda.gov/cdrh/dsmamain.html>".

Sincerely yours,

A handwritten signature in black ink that reads "Steven Gutman". The signature is written in a cursive style with a large initial 'S' and 'G'.

Steven I. Gutman, M.D., M.B.A.
Director
Division of Clinical Laboratory Devices
Office of Device Evaluation
Center for Devices and Radiological Health

Meridian Diagnostics, Inc.
Cincinnati, OH 45244

Response Items: K980076
Premier Platinum HpSA

Indications For Use Statement

510(k) Number (if known): K980076

Device Name: Premier HpSA

Indications For Use:

The Premier Platinum HpSA enzyme immunoassay (EIA) is an *in vitro* qualitative procedure for the detection of *Helicobacter pylori* antigens in human stool. Test results are intended to aid in the diagnosis of *H. pylori* infection in adult symptomatic patients.

PLEASE DO NOT WRITE BELOW THIS LINE - CONTINUE ON ANOTHER PAGE IF NEEDED

Concurrence of CDRH, Office of Device Evaluation (ODE)

Woody Dubois
(Division Sign-Off)
Division of Clinical Laboratory Devices
510(k) Number K980076

Prescription Use X
(Per 21 CFR 801.109)

OR

Over-The-Counter Use _____
(Optional Format 1-2-96)