K982245

OCT 6 1998

510(k) Summary of Safety and Effectiveness

Triage® Parasite Panel

A. Name and Address of Submitter

- Company Name and Address: Biosite Diagnostics, Inc.
  11030 Roselle St.
  San Diego, CA 92121
  Telephone: (619) 455-4808
  FAX: (619) 455-4815

Contact Person: John F. Bruni, Ph.D.

Date Summary Prepared: 09/02/98

B. Device Names

1. Trade Name

   Triage® Parasite Panel

2. Common Names

   An immunoassay for the detection of the antigens for *Entamoeba. histolytica, Giardia lamblia and Cryptosporidium parvum* in human fecal specimens.

3. Classification Name

   Entamoeba histolytica serological reagents

C. Legally Marketed Devices

Single Test Kits Manufactured by Alexon, TechLabs, Meridian Diagnostics for the same parasites using enzyme immunoassay technology.

D. Device Description

The Triage® Parasite Panel is an enzyme immunoassay used to detect the presence of parasite specific antigens in human fecal specimens. It is a membrane based immunoassay that depends on the detection of the antigen using antibodies with specificities to at least two distinct antigenic sites on the molecule.

E. Intended Use

The Triage® Parasite Panel is an enzyme immunoassay used for the detection of antigens for Entamoeba histolytica, Giardia lamblia and Cryptosporidium parvum in human fecal specimens. This test is used as an aid in the diagnosis of intestinal parasitic disease.

F. Comparison of the Methods with Predicate Devices

The Triage® Parasite Panel provides a qualitative determination of the presence of parasite specific antigens in human fecal specimens. Other tests manufactured by Alexon, Trend, LMD laboratories, TechLabs are all enzyme immunoassays that have been cleared through the 510(k) process. These tests have been shown to provide essentially the same clinical results as traditional O&P examination using microscopic visualization of various phases of the life cycle of the parasite.

G. Summary of Analytical Data

Analytical Sensitivity

The analytical sensitivity of the Triage® Parasite Panel is 3 ng of alpha-1-giardin (*G. lamblia)*, 4 ng of 29 kDa surface antigen (*E. histolytica/dispar)* and 6 ng of protein disulfide isomerase (*C. parvum)* per milliliter of fecal specimen.

Reproducibility

The precision and reproducibility of this product has been demonstrated to be comparable to other products of this nature.

H. Summary of Clinical Data

The performance of the Triage® Parasite Panel was evaluated using both positive and negative stool specimens. All specimens were examined using standard ova and parasite examination using Modified Acid Fast Staining and Trichrome Staining procedures. The results of the Triage® Parasite Panel were compared to standard ova and parasite examination for the presence of *G. lamblia, E. histolytica/dispar,* and *C. parvum.* The clinical sensitivity and specificity, the positive and negative predictive value, the 95% confidence intervals and the prevalence of the disease in the population tested are presented.

O & P Evaluation

Triage G. lamblia	+	-	Total
+	135	35	170
-	7	267	274
Total	142	302	444

Sensitivity		95.1%	
Specificity		88.4%	
		LOWER LIMIT	UPPER LIMIT
95% Confidence Limits Sensitivity		91.5%	98.6%
95% Confidence Limits Specificity		84.8%	92.0%
95% Confidence Limits Agreement		87.8%	93.3%
Positive Predictive Value	79.4%		
Negative Predictive Value	97.4%		
Prevalence	32.0%		

		O & P Evaluation		
		+	-	Total
Triage E. histolytica/ dispar	+	38	60	98
	-	4	341	345
	Total	42	401	443

Sensitivity		**90.5%**	
Specificity		**85.0%**	
		LOWER LIMIT	**UPPER LIMIT**
95% Confidence Limits Sensitivity		**81.6%**	**99.4%**
95% Confidence Limits Specificity		**81.5%**	**88.5%**
95% Confidence Limits Agreement		**82.3%**	**88.8%**
Positive Predictive Value	**38.8%**		
Negative Predictive Value	**98.8%**		
Prevalence	**9.5%**		

The large number of "apparent false positive results" using the Triage® Parasite Panel is primarily attributed the overall lack of sensitivity of microscopic examination as compared to culture. The sensitivity of microscopic examination has been reported to be 62% as compared to culture techniques.

Triage C. parvum	O & P Examination +	O & P Examination -	Total
+	53	7	60
-	5	379	384
Total	58	386	444

		LOWER LIMIT	UPPER LIMIT
Sensitivity	91.4%		
Specificity	98.2%		
95% Confidence Limits Sensitivity		84.2%	98.6%
95% Confidence Limits Specificity		96.9%	99.5%
95% Confidence Limits Agreement		95.8%	98.8%
Positive Predictive Value	88.3%		
Negative Predictive Value	98.7%		
Prevalence	13.1%		

All specimens were tested using commercially available immunoassays. Those specimens that produced a positive result were evaluated using the "gold standard" of microscopic examination. Statistical analysis of the data showed that the sensitivity of the three tests contained in the Triage® Parasite Panel was not statistically different from those of commercially available immunoassays for *Giardia lamblia, Entamoeba histolytica/dispar,* and *Cryptosporidium parvum* that have reported sensitivities of 96%, 87% and 95% when compared to microscopic techniques. Additionally, there was not a statistical difference in the specificity of the Triage® *G. lamblia* or the *C. parvum* tests when compared to commercially available tests, each having a reported specificity of 98% for both organisms. The specificity of the Triage® *E. histolytica* test was significantly greater than a commercially available immunoassay having a reported specificity of 99%.

Conventional microscopic examination of fecal specimens has been demonstrated to be less sensitive than other scientifically valid techniques for the identification of the presence of parasites, including immunoassays and the detection of parasite-specific nucleic acid. In addition, the presence of disease as determined by collection and analysis of multiple specimens from the same patient provides evidence for the lack of clinical sensitivity of conventional microscopic examination . Inasmuch as the "gold standard" is not ideal for the detection of the organisms, the likelihood of observing false positive results using a comparative method is increased. Therefore, those specimens producing apparent false positive results in the Triage® Parasite Panel were evaluated using other commercially available enzyme immunoassays. Twenty-eight of the 35 apparent false positive results for *G. lamblia*, 57 of the 60 apparent false positive results for the *E. histolytica/dispar* and, 6 of the 7 apparent false positive results for the *C. parvum* test also were positive using other commercial immunoassays for these same organisms. These results support the studies stating that the sensitivity of conventional microscopic examination is less than desired.

I. Conclusion

The Triage® Parasite Panel is an enzyme immunoassay used for the detection of antigens for Entamoeba histolytica, Giardia lamblia and Cryptosporidium parvum in human fecal specimens. This test is used as an aid in the diagnosis of intestinal parasitic disease. The summarized data provided demonstrate that the Triage® Parasite Panel produces essentially the same results as the recognized standard methods for the identification of parasites in stool specimens. Additionally, the Triage® Parasite Panel produces essentially the same results as other commercially available products.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
2098 Gaither Road
Rockville MD 20850

OCT 6 1998

John F. Bruni, Ph.D.
Director, Clinical and Regulatory Affairs
Biosite Diagnostics
11030 Roselle Street
San Diego, CA 92121

Re: K982245
Trade Name: Triage® Parasite Panel, Triage Cryptosporidium, Giardia and Entamoeba
Regulatory Class: II
Product Code: MHI; MHJ; GMO
Dated: September 2, 1998
Received: September 8, 1998

Dear Dr. Bruni:

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 requirements, 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,

Steven Gutman

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

Enclosure

5 lO(k) Number if known) K982245

Device Name: Triage® Parasite Panel

Indications for Use:

The Triage® Parasite Panel is an enzyme immunoassay used for the detection of antigens for *Entamoeba histolytica/dispar, Cryptosporidium parvum* and *Giardia lamblia* in human fecal specimens. The test will be offered as singular tests for each protein, combinations of two organisms per panel and a panel consisting of all three tests. This test is used as an aid in the diagnosis of intestinal parasitic diseases.

(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 K982245

Prescription Use X OR Over-The Counter Use___