AUG 21 1998

K981498

510(k) Summary of Safety and Effectiveness

This summary of 510(k) safety and effectiveness information is being submitted in accordance with the requirements of SMDA 1990 and 21 CFR 807.92.

The assigned 510(k) number is: _____

Applicant Information:

Date Prepared:	April 24, 1998
Name:	Diamedix Corporation
Address:	2140 N. Miami Avenue Miami, FL 33127
Contact Person:	Dr. Lynne Stirling
Phone Number:	305-324-2354
Fax Number:	305-324-2585

Device Information:

Trade Name:	Is-Toxoplasma IgG Test System
Common Name:	*Toxoplasma gondii* EIA Test
Classification Name:	Enzyme linked immunosorbent assay, *Toxoplasma gondii* (866.3780)

Equivalent Device:
Incstar Toxoplasma IgG ELISA Kit

Device Description: The Is-Toxoplasma IgG Test System is an enzyme-linked immunosorbent assay (ELISA) for the qualitative and quantitative detection of IgG to *Toxoplasma gondii* in human serum

Intended Use: The assay is intended for use in detecting IgG antibodies to *T. gondii* antigen in human serum. The results of the assay can be used as an aid in the assessment of the patient's immunological response to infection with *T. gondii* and in the determination of immune status of individuals, including females of child-bearing age. The evaluation of paired sera can aid in the diagnosis of primary or reactivated infection.

Principle of the Procedure: The Is-Toxoplasma IgG Test System is an enzyme-linked immunosorbent assay to detect IgG to Toxoplasma gondii in human serum. Partially purified T. gondii antigens are attached to a solid phase microtiter well. Diluted test sera are added to each well. If antibodies which recognize the T. gondii antigens are present in the patient sample they will bind to the antigens on the well. After incubation, the wells are washed to remove unbound antibody. An enzyme labeled anti-human immunoglobulin (conjugate) is added to each test well. If antibody is present the enzyme-linked antibody will bind to it. After incubation, the wells are washed to remove unbound conjugate. A substrate solution is then added to each well. If enzyme is present from the prior step, the reaction is stopped and the color intensity is measured photometrically producing an indirect measure of the specific antibody present in the patient sample.

SUMMARY OF SAFETY AND EFFECTIVENESS

Performance Characteristics

A. Comparison Testing

A total of six hundred and twenty one sera were tested for the presence of toxoplasma IgG antibodies using the Diamedix Is-Toxoplasma IgG Test Kit and three other marketed tests at two independent sites (site #1, Miami, FL and site #2, Salt Lake City, Utah) as well as at Diamedix Corp., Miami, FL (site #3). At site #3 testing was performed both manually and using the MAGO Plus Automated EIA Processor.

Site #1 tested 200 samples (37% fresh and 73% frozen). Samples were obtained from the S. Florida area. Site #1 purposefully selected their sample population in order to provide an equal number of positive and negative results. Table 1 compares the results obtained for the Is-Toxoplasma IgG Test Kit and their currently used testing method.

Site #2 tested 179 samples (all fresh) submitted for ToRCH screening. Samples were obtained from the West region. Table 2 compares the results obtained for the Is-Toxoplasma IgG Test Kit and their currently used testing method.

TABLE 1

Is-Toxoplasma IgG - Site #1

Other EIAs	Positive	Negative	Equivocal
Positive	98 [23]	14 [4]	3
Negative	1	77 [29]	0
Equivocal	0	6	1

			*95% CI**
Relative Sensitivity	98/112	= 87.5%	81.4 - 93.6
Relative Specificity	77/78	= 98.7%	93.1 - 100.0
Overall Agreement**	175/190	= 92.1%	87.3 - 95.5

TABLE 2

Is-Toxoplasma IgG - Site #2

	Positive	Negative	Equivocal
Positive	14 [6]	1	0
Negative	0	164 [65]	0
Equivocal	0	0	0

			*95% CI**
Relative Sensitivity	14/15	= 93.3%	68.0 - 99.8
Relative Specificity	164/164	= 100.0%	97.8 - 100.0
Overall Agreement**	178/179	= 99.4%	96.9 - 100.0

For Site #1, further resolution of the discordant samples was performed by testing such samples in a referee EIA method. Twelve of the samples negative by the Is-Toxoplasma IgG Test Kit and positive by the other EIA were negative by the referee method; the remaining two sera were equivocal. The sample that was positive in the Is-Toxoplasma IgG Test Kit and negative in the other EIA was negative when tested by the referee method.

For Site #2, further resolution of the discordant sample was performed in a similar manner. The sample that was negative in the Is-Toxoplasma IgG Test Kit and positive by the other EIA was negative in the referee EIA method.

Site #3 (Diamedix Corp.) tested 242 samples (all frozen) by the manual method and 241 of these samples (one being QNS) by the MAGO Plus method. Samples were obtained from S. Florida blood donors. Tables 3 and 4 compare the results obtained for the Is-Toxoplasma IgG Test Kit and another marketed EIA method.

TABLE 3

Is-Toxoplasma IgG - Site #3 : Manual

Other EIA	Positive	Negative	Equivocal
Positive	47 [16]	5	2
Negative	1	186 [73]	0
Equivocal	0	1	0

			*95% CI**
Relative Sensitivity	47/52	= 92.2%	81.5-97.9
Relative Specificity	186/187	= 99.5%	97.1-100.0
Overall Agreement**	233/239	= 97.5%	94.6-99.1

TABLE 4

Is-Toxoplasma IgG - Site #3 : MAGO Plus

	Positive	Negative	Equivocal
Positive	49	4	1
Negative	1	185	0
Equivocal	0	1	0

			*95% CI**
Relative Sensitivity	49/53	= 92.5%	81.8-97.9
Relative Specificity	185/186	= 99.5%	97.0-100.0
Overall Agreement**	234/239	= 97.9 %	95.2-99.3

[ ] denotes samples from females of child-bearing age.

* 95% Confidence Intervals (CI) calculated by the Exact Method.

** Equivocal results were excluded from calculations

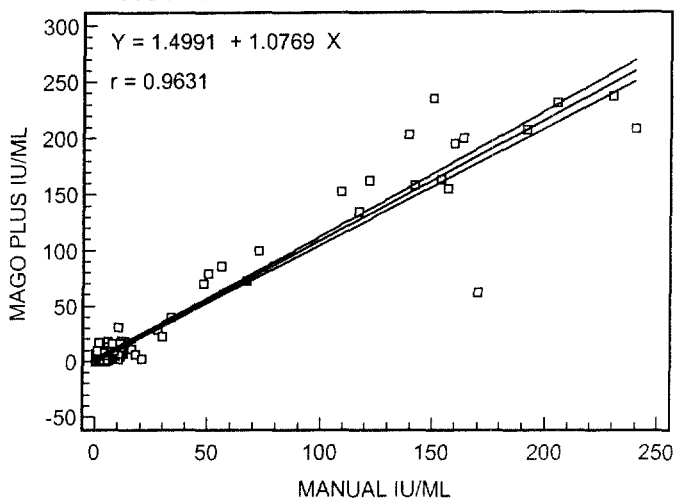
For Site #3 (manual testing), further resolution of the discordant sera revealed that the 5 sera negative in the Is-Toxoplasma IgG Test Kit but positive in the other EIA were also negative by a referee EIA method. The serum that was positive in the Is-Toxoplasma IgG Test Kit and negative in the other EIA was positive by the referee method. For MAGO Plus testing, the 4 sera that were negative in the Is-Toxoplasma IgG Test Kit but positive in the other EIA were also negative by a referee EIA method. The serum that was positive in the Is-Toxoplasma IgG Test Kit and negative in the other EIA was positive by the referee method.

NOTE : Please be advised that 'relative' refers to the comparison of the assay's results to that of a similar assay. There was not an attempt to correlate the assay's results with disease presence or absence. No judgment can be made on the comparison assay's accuracy to predict disease.

B. Correlation of Manual and MAGO Plus Results

The Is-Toxoplasma IgG Test Kit has been developed for automated as well as manual use. To demonstrate the equivalence of the manual and MAGO Plus Procedures, the results of 211 serum samples tested in the comparison studies were plotted. Thirty highly reactive samples exceeded the reportable range and were excluded from this comparison. A scattergram and regression line of the results obtained with 95% confidence intervals is shown in Figure 1.

FIGURE 1 : Manual vs MAGO Plus Correlation



C. Linearity

Several strongly positive serum samples were serially diluted and separate dilutions were assayed, in duplicate, in the Is-Toxoplasma IgG Test Kit both manually and using the MAGO Plus Automated EIA Processor. Representative linear regression graphs and scattergrams of the mean results with 95% confidence intervals are presented in Figures 2 and 3 for one patient sample. The results demonstrate a high degree of linearity throughout the reportable range of the assay when samples are tested either manually or by MAGO Plus.

FIGURE 2 : Manual Linearity

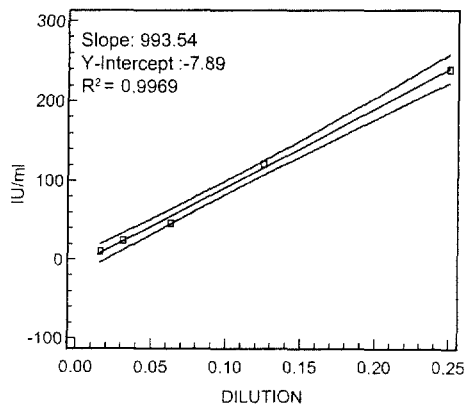
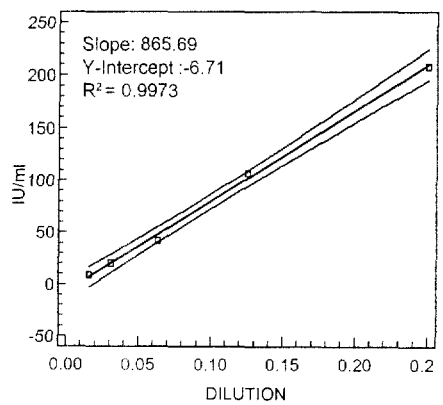


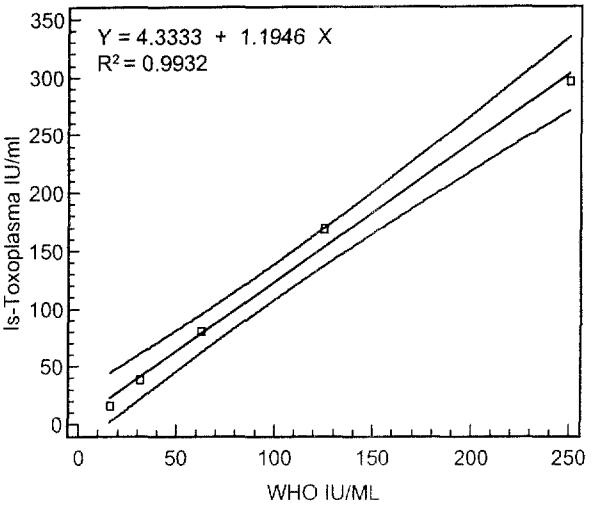
FIGURE 3 : MAGO Plus Linearity



D. Correlation to WHO Standard

The Is-Toxoplasma IgG Test Kit has been calibrated against the WHO 3rd International Standard for Anti-Toxoplasma Serum (code TOXM). To demonstrate the accuracy of the quantitative procedure, several dilutions of the WHO Standard were prepared and assayed manually in triplicate in two different runs on two different days versus the Is-Toxoplasma IgG Test Kit standard curve. The linear regression graph and scattergram of the mean results with 95% Confidence Intervals is shown in Figure 4.

FIGURE 4 : Dilutions of WHO Standard assayed against Is-Toxoplasma IgG Standards



E. Quantitative Data

Serum pairs were obtained by preparing multiple two-fold dilutions of several strongly positive sera. Ratios for dilutions representing a four-fold difference in antibody level were evaluated as a serum pair both manually and using the MAGO Plus. Overall, it was estimated that a 3.9 to 6.2 fold (mean 5.1-fold) increase in Is-Toxoplasma IgG IU/ml values corresponded to a four-fold titer increase in Toxoplasma IgG antibody levels.

F. Cross Reactivity

Sera containing IgG antibodies to viruses potentially cross-reactive to *T. gondii* have been tested in the Is-Toxoplasma IgG Test Kit. Fifty sera negative for IgG antibodies to *T. gondii* in the Is-Toxoplasma IgG Test Kit as well as in another marketed test but positive for one or more viruses were evaluated. In additon, nine of these sera were positive for anti-nuclear antibodies (ANA) and two were positive for anti-DNA. The data in the following table suggest that no cross-reactivity should be expected with the Is-Toxoplasma IgG Test Kit from these analytes.

TABLE 5

Analyte	Toxoplasma IgG	VZV IgG	HSV IgG	CMV IgG	Rubella IgG	EBV IgG	anti-DNA	ANA
No.of Pos. Samples	0	48	47	37	49	48	2	9

G. Precision

Six serum samples, spanning the reportable range, as well as the 50 IU/ml kit Standard and kit Low Positive and Negative Controls were tested quantitatively and values calculated from IU/ml results. Sites #1 and #2 tested samples in triplicate in three separate runs on three different days. Site #3 (Diamedix Corp.) tested samples in triplicate in two separate runs on three different days both manually and using the MAGO Plus Automated EIA Processor. The results obtained are shown in Tables 6-9.

TABLE 6 : Site #1- Intra-Assay and Interassay Precision

SERUM	INTRA-ASSAY DAY 1			INTRA-ASSAY DAY 2			INTRA-ASSAY DAY 3			INTERASSAY (n=9)		
	MEAN IU/ml	SD	CV%	MEAN IU/ml	SD	CV%	MEAN IU/ml	SD	CV%	MEAN IU/ml	SD	CV%
A	7.9	1.35	17.09	8.2	2.05	25.00	7.9	2.36	29.87	8.0	1.71	21.38
B	31.3	1.40	4.47	30.7	1.46	4.76	26.2	2.90	11.07	29.4	3.00	10.20
C	159.7	4.51	2.82	173.6	5.21	3.00	147.2	7.01	4.76	160.2	12.45	7.77
D	170.8	13.32	7.80	177.4	14.38	8.11	165.4	29.49	17.83	171.2	18.45	10.78
E	274.7	28.55	10.39	259.1	23.31	9.00	257.1	14.66	5.70	263.6	21.52	8.16
F	83.1	10.28	12.37	89.6	12.94	14.44	81.1	19.90	24.54	84.6	13.50	15.96
50 STD	54.6	4.46	8.17	54.9	5.60	10.20	53.5	8.35	15.61	54.3	5.53	10.18
LPC	128.1	1.56	1.22	138.1	3.15	2.28	146.4	18.42	12.58	137.7	12.16	8.83
NC	13.2	0.40	3.03	12.9	0.51	3.95	15.7	1.65	10.51	13.9	1.58	11.37

TABLE 7 : Site #2- Intra-Assay and Interassay Precision

SERUM	INTRA-ASSAY DAY 1			INTRA-ASSAY DAY 2			INTRA-ASSAY DAY 3			INTERASSAY (n=9)		
	MEAN IU/ml	SD	CV%	MEAN IU/ml	SD	CV%	MEAN IU/ml	SD	CV%	MEAN IU/ml	SD	CV%
A	10.1	1.46	14.46	5.4	1.03	19.07	1.1	1.47	133.60	5.5	4.07	74.00
B	25.9	3.56	13.75	25.0	2.79	11.16	21.0	1.15	5.48	24.0	3.25	13.54
C	145.1	8.32	5.73	136.3	5.15	3.78	70.3	4.79	6.81	117.2	35.83	30.57
D	162.8	8.92	5.48	132.9	3.70	2.78	95.1	2.96	3.11	130.3	29.81	22.88
E	250.0	0.00	0.00	237.9	9.96	4.19	189.2	8.92	4.71	225.7	28.68	12.71
F	56.8	6.61	11.64	75.5	2.76	3.66	31.0	3.80	12.26	54.5	19.77	36.28
50 STD	48.7	6.57	13.49	51.7	3.79	7.33	41.8	0.76	1.82	47.4	5.82	12.28
LPC	134.9	19.60	14.53	123.1	11.22	9.11	123.1	11.22	9.11	127.0	13.92	10.96
NC	11.8	1.68	14.24	11.5	1.93	16.78	11.5	1.93	16.78	11.6	1.61	13.88

TABLE 8 : Site #3-Intra-Assay and Interassay Precision (Manual)

SERUM	INTRA-ASSAY DAY 1			INTRA-ASSAY DAY 2			INTRA-ASSAY DAY 3			INTERASSAY (n=18)		
	MEAN IU/ml	SD	CV%	MEAN IU/ml	SD	CV%	MEAN IU/ml	SD	CV%	MEAN IU/ml	SD	CV%
A	2.6	1.51	58.08	1.9	0.44	23.16	2.4	0.70	29.17	2.3	0.98	42.61
B	17.4	2.08	11.95	19.3	2.28	11.81	19.2	1.41	7.34	18.7	2.04	10.91
C	115.3	8.59	7.45	105.6	9.88	9.36	105.6	22.04	20.87	108.8	14.69	13.50
D	141.6	5.54	3.91	141.6	6.90	4.87	137.7	10.86	7.89	140.3	7.82	5.57
E	238.7	20.56	8.61	246.8	16.69	6.76	240.7	19.48	8.09	242.1	18.17	7.51
F	55.1	5.21	9.46	46.3	1.62	3.50	58.0	8.22	14.17	53.3	7.32	13.73
50 STD	56.7	8.12	14.32	55.4	8.99	16.23	57.3	3.53	6.16	56.5	6.89	12.19
LPC	138.8	10.99	7.92	139.0	8.07	5.81	148.6	8.29	5.58	142.1	9.87	6.95
NC	14.1	0.96	6.81	12.9	1.21	9.38	15.4	2.09	13.57	14.1	1.76	12.48

TABLE 9 : Site #3- Intra-assay and Interassay Precision (MAGO Plus)

SERUM	INTRA-ASSAY DAY 1			INTRA-ASSAY DAY 2			INTRA-ASSAY DAY 3			INTERASSAY (n=18)		
	MEAN IU/ml	SD	CV%	MEAN IU/ml	SD	CV%	MEAN IU/ml	SD	CV%	MEAN IU/ml	SD	CV%
A	2.0	1.54	77.00	2.0	2.60	130.00	3.9	1.89	48.46	2.6	2.15	82.69
B	17.9	2.34	13.07	12.3	8.70	70.73	20.3	6.22	30.64	16.8	6.87	40.89
C	150.0	5.99	3.99	154.3	5.07	3.29	156.6	20.31	12.97	153.6	12.14	7.90
D	149.5	20.43	13.67	163.8	19.35	11.81	181.6	16.15	8.89	165.0	22.19	13.45
E	>250	N/A	N/A	>250	N/A	N/A	>250	N/A	N/A	>250	N/A	N/A
G	40.9	1.95	4.77	40.4	2.42	5.99	41.8	2.65	6.34	41.0	2.30	5.61
50 STD	65.7	4.24	6.45	79.2	10.45	13.19	78.4	9.35	11.93	74.4	10.19	13.70
LPC	170.9	11.34	6.64	195.8	8.83	4.51	208.8	15.98	7.65	191.8	19.94	10.40
NC	15.8	2.18	13.80	15.1	4.82	31.92	24.8	3.52	14.19	18.5	5.70	30.81

Expected Values

The prevalence of Toxoplasma IgG antibodies in the normal population can vary depending on a number of factors such as age, geographical location, socio-economic status, race and type of test used. It has been estimated that in the United States 8-20% of the normal population has anti-toxoplasma IgG antibodies (1). For females of child-bearing age and for pregnant females prevalence rates from 16 to 50% have been reported (3).

In the present studies sera from 100 healthy South Florida donors (52 female and 48 male) were evaluated in the Is-Toxoplasma IgG Test Kit. Of the 100 samples, 22 (22%) were found to be positive and 78 (78%) were negative. Age distribution, geographic location and prevalence is provided in Table 10. Histograms demonstrating the distribution of IU/ml values are shown in Figures 5 and 6.

Thirty-seven of the female donors were of child-bearing age (18-45 years). Of the sera from these donors, 2 (5%) were positive and 35 (95%) were negative. A total of 45 sera from pregnant females (15 from each trimester) were also tested in the Is-Toxoplasma IgG Test Kit. Nine (20%) were positive and 36 (80%) were negative for anti-toxoplasma IgG. In addition, a total of 216 samples from females of childbearing age were identified in the outside and in-house clinical studies (these included the 45 sera from pregnant females already referenced). Of these samples, 45 (21%) were positive and 171 (79%) were negative for anti-toxoplasma IgG when evaluated in the Is-Toxoplasma IgG Test Kit.

TABLE 10

	Number of donors	Prevalence
Total Number	100	22%
Geographic location : South Eastern US	100	22%
Age		
10-19	13	15.4%
20-29	23	17.4%
30-39	40	17.5%
40-49	13	15.4%
50-59	5	40.0%
60-69	6	83.0%

FIGURE 5

Is-Toxoplasma IgG Positive Population

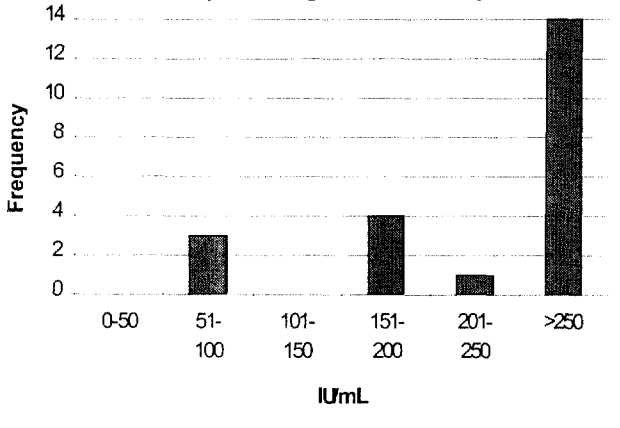
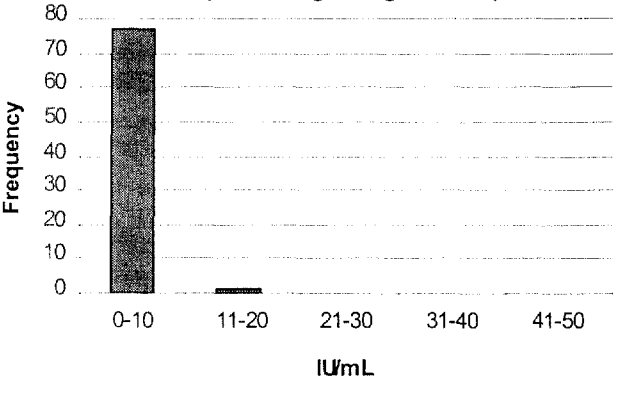


FIGURE 6

Is-Toxoplasma IgG Negative Population



DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
2098 Gaither Road
Rockville MD 20850

AUG 21 1998

Lynne Stirling, Ph.D.
Vice President, Regulatory Affairs
Diamedix Corporation
2140 N. Miami Ave.
Miami, FL 33127

Re: K981498
Trade Name: Is-Toxoplasma IgG Test System
Regulatory Class: II
Product Code: LGD
Dated: June 23, 1998
Received: June 25, 1998

Dear Dr. Stirling:

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 legally marketed predicate 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

Appendix G. Indications for Use Statement

INDICATIONS FOR USE STATEMENT

510(K) NUMBER : K981498

DEVICE NAME : Is-Toxoplasma IgG Test System

Indications for Use : The Diamedix Is-Toxoplasma IgG Test Kit is an Enzyme Immunoassay (EIA) for the qualitative and quantitative determination of IgG antibodies in human serum to aid in the assessment of the patient's immunological response to infection with *Toxoplasma gondii* and in the determination of the immune status of individuals, including females of child-bearing age. The evaluation of acute and convalescent sera can aid in the diagnosis of primary or reactivated infection with *Toxoplasma gondii.* These reagents can be used either manually or in conjunction with the MAGO® Plus Automated EIA Processor. This product is not FDA cleared for use in screening blood and plasma donors.

Woody Dubois

(Division Sign-Off)
Division of Clinical Laboratory Devices
510(k) Number K981498