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:	March 19, 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-CMV IgG Test System
Common Name:	CMV EIA Test
Classification Name:	Enzyme linked immunosorbent assay, cytomegalovirus

Equivalent Device:
Incstar CMV IgG ELISA Kit

Device Description: The Is-CMV IgG Test System is an enzyme-linked immunosorbent assay (ELISA) for the detection and semi-quantitation of IgG to CMV antigen in human serum

Intended Use: The assay is intended for use in detecting IgG antibodies to CMV 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 CMV and, when evaluating paired sera, as an aid in the diagnosis of primary infection, reactivated infection or reinfection.

Principle of the Procedure:

The Is-CMV IgG Test System is an enzyme-linked immunosorbent assay to detect IgG to CMV in human serum. Partially purified CMV antigen is attached to a solid phase microtiter well. Diluted test sera are added to each well. If antibodies which recognize the CMV antigen are present in the patient sample they will bind to the antigen in 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 five hundred and eighty seven sera were tested for the presence of CMV IgG antibodies using the Diamedix Is-CMV IgG Test Kit and two 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 (26% fresh and 74% frozen). Samples were obtained from the S. Florida area. Table 2 compares the results obtained for the Is-CMV IgG test kit and their currently used testing method.

Site #2 tested 178 samples (all fresh). Samples were obtained from the Mid-West area. Table 3 compares the results obtained for the Is-CMV IgG test kit and their currently used testing method.

TABLE 2

Is-CMV IgG - Site #1

Other EIA	Positive	Negative	Equivocal
Positive	146	1	1
Negative	1	47	3
Equivocal	0	1	0

		*95% CI***
Relative Sensitivity	146/147 = 99.3%	96.3-100.0
Relative Specificity	47/48 = 97.9%	88.9-99.9
Overall Agreement*	193/195 = 99.0%	96.3-99.9

TABLE 3

Is-CMV IgG - Site #2

	Positive	Negative	Equivocal
Positive	113	4	2
Negative	0	51	1
Equivocal	0	6	1

		*95% CI***
Relative Sensitivity	113/117 = 96.6%	91.5-99.1
Relative Specificity	51/51 = 100.0%	93.0-100.0
Overall Agreement*	164/168 = 97.6%	94.0-99.3

For site#1, both discordant sera were negative when tested by a referee EIA. For site #2, the four discordant sera were negative when tested by a referee EIA.

Site #3 (Diamedix Corp.) tested 209 samples (all frozen) by the manual method and 206 of these samples (three being QNS) by the MAGO Plus method. Samples were obtained from S. Florida blood donors. Tables 4 and 5 compare the results obtained for the Is-CMV IgG test kit and another marketed EIA method.

TABLE 4

Is-CMV IgG - Site #3 : Manual

Other EIA	Positive	Negative	Equivocal
Positive	152	0	0
Negative	3	50	1
Equivocal	2	1	0

		*95% CI***
Relative Sensitivity	152/152 = 100.0%	97.6-100.0
Relative Specificity	50/53 = 94.3%	84.3-98.8
Overall Agreement*	202/205 = 98.5%	95.8-99.7

TABLE 5

Is-CMV IgG - Site #3 : MAGO Plus

	Positive	Negative	Equivocal
Positive	152	0	0
Negative	6	43	2
Equivocal	2	1	0

		*95% CI***
Relative Sensitivity	152/152 = 100.0%	97.6-100.0
Relative Specificity	43/49 = 87.8. %	75.2-95.4
Overall Agreement*	195/201 = 97.0 %	93.6-98.9

* equivocal results excluded from calculations

** 95% Confidence Intervals (CI) calculated by the Exact Method (7)

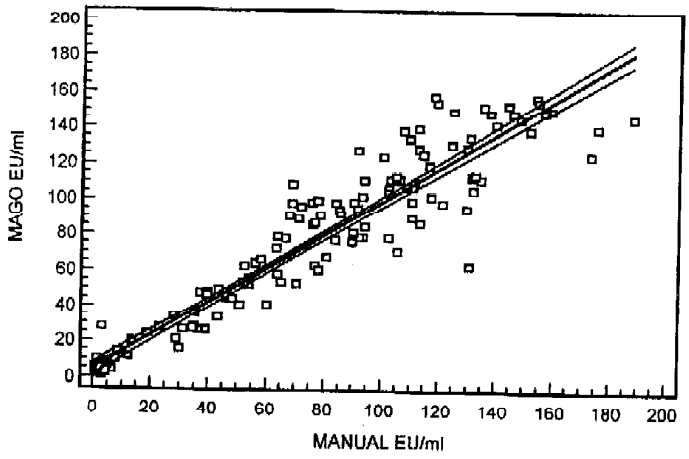
For site #3 (manual testing), two of the discordant sera were positive and the remaining sample was equivocal when tested by a referee EIA. For the six sera discordant when tested by the MAGO Plus, three were positive, two were negative and one was equivocal when tested by the referee EIA.

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 Results

The Is-CMV 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 160 serum samples tested in the comparison studies were plotted. Forty-six 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 3.

FIGURE 3 : Manual vs MAGO Plus Correlation



Slope: 0.9415
Intercept: 4.6521
R: 0.9568

C. CDC Serum Panel Data

The following information was obtained wth the Centers for Disease Control and Prevention (CDC) serum panel for CMV serology assays which was tested by the Is-CMV IgG Test Kit both manually and using the MAGO Plus Automated Processor. The results are presented as a means to convey further information on the performance of this assay with a masked characterized serum panel. Results were submitted to the CDC for their interpretation and evaluation. This does not imply an endorsement of the assay by the CDC.

The panel consists of 66% positive and 34% negative samples. The Diamedix Is-CMV IgG test demonstrated 99% (99 of 100) total agreement with the CDC results. Of the results obtained by Diamedix, there was 100% (66 of 66) agreement with the positive results using both the manual and automated methods and 97% (33 of 34) agreement with the negative specimens using both the manual and automated methods.

D. Linearity

Several strongly positive serum specimens were diluted (2-fold) and separate dilutions were assayed, in duplicate, in the Is-CMV IgG Test Kit both manually and using the MAGO Plus Automated Processor. Representative linear regression graphs and scattergrams of the mean results with 95% confidence intervals are presented in Figures 4 and 5 for one patient sample tested both manually and using the MAGO Plus. 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 4 : Manual Linearity

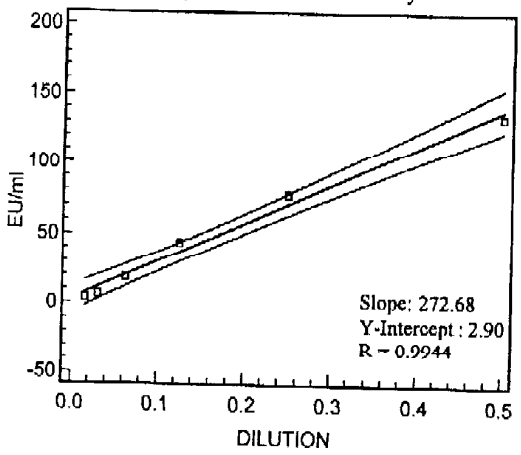
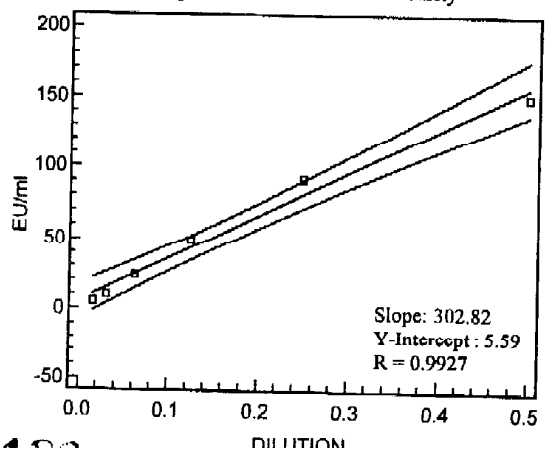


Figure 5 : MAGO Plus Linearity



E. Semi-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 2.3- to 6.1 fold (mean 4.2-fold) increase in Is-CMV IgG EU/ml values corresponded to a four-fold titer increase in CMV IgG antibody levels.

F. Cross Reactivity

Sera containing IgG antibodies to viruses potentially cross-reactive to CMV have been tested in the Is-CMV IgG Test Kit Forty-seven sera negative for antibodies to CMV in the Is-CMV IgG as well as in another marketed test but positive for one or more viruses were used. The data in the following table suggest that no cross-reactivity should be expected with the Is-CMV IgG Test Kit from these analytes.

TABLE 6

Analyte	CMV IgG	VZV IgG	HSV 1/2 IgG	Toxoplasma IgG	Rubella IgG	EBV IgG	Measles IgG
No.of Pos. Samples	0	45	35	6	38	45	43

G. Precision

Six serum samples (two negative and four positive) as well as the10 EU/ml kit Standard and kit controls were tested in triplicate in three separate runs. The precision studies were performed manually at the two independent testing sites (site #1 and site #2) and at site #3 (Diamedix Corp.) both manually and using the MAGO Plus Automated Processor. The results obtained are shown in Tables 7-10.

TABLE 7 : Site #1- Intra-Assay and Interassay Precision

SERUM	INTRA-ASSAY DAY 1			INTRA-ASSAY DAY 2			INTRA-ASSAY DAY 3			INTERASSAY		
	MEAN	SD	CV%	MEAN	SD	CV%	MEAN	SD	CV%	MEAN	SD	CV%
A	5.0	3.76	75.20	4.1	2.11	51.46	4.1	2.12	51.71	4.4	2.44	55.45
B	4.7	0.44	9.36	4.9	0.31	6.33	4.8	0.26	5.42	4.8	0.31	6.46
C	28.5	7.09	24.88	21.6	2.02	9.35	21.9	2.20	10.05	24.0	5.12	21.33
D	39.4	9.88	25.08	38.2	3.81	9.97	38.9	3.97	10.21	36.8	5.68	14.64
E	55.0	0.31	0.56	61.1	1.40	2.29	62.6	1.38	2.20	59.6	3.59	6.02
F	139.3	7.61	5.46	138.6	6.41	4.62	141.9	6.43	4.53	139.9	6.11	4.37
10 STD	11.5	1.76	15.30	10.2	1.13	11.08	10.1	1.16	11.49	10.6	1.36	12.83
HPC	114.6	12.88	11.24	107.2	5.20	4.85	109.9	5.40	4.91	110.6	8.13	7.35
LPC	25.0	1.70	6.80	23.9	2.17	9.08	24.3	2.25	9.26	24.4	1.85	7.58
NC	3.1	0.23	7.42	2.6	0.25	9.62	2.7	0.31	11.48	2.8	0.33	11.79

TABLE 8 : Site #2 - Intra-Assay and Interassay Precision

SERUM	INTRA-ASSAY DAY 1			INTRA-ASSAY DAY 2			INTRA-ASSAY DAY 3			INTERASSAY		
	MEAN	SD	CV%	MEAN	SD	CV%	MEAN	SD	CV%	MEAN	SD	CV%
A	3.8	0.40	10.53	3.0	0.74	24.67	2.5	0.44	17.60	3.1	0.75	24.19
B	4.7	0.06	1.28	3.3	0.81	24.55	3.8	0.87	22.89	4.0	0.86	21.50
C	14.1	1.75	12.41	14.2	3.41	24.01	17.2	0.31	1.80	15.2	2.44	16.05
D	30.0	3.44	11.47	27.8	1.10	3.96	23.5	3.05	12.98	27.1	3.70	13.65
E	60.5	8.38	13.85	45.2	2.00	4.42	43.7	2.26	5.17	49.8	9.23	18.53
F	96.3	12.92	13.42	97.8	6.27	6.41	92.3	0.95	1.03	95.5	7.60	7.96
10 STD	9.4	1.21	12.87	9.7	1.04	10.72	8.3	1.74	20.95	9.1	1.35	14.84
HPC	85.7	2.47	2.88	89.0	3.06	3.43	84.9	2.09	2.46	86.6	2.95	3.41
LPC	22.5	1.58	7.02	22.5	1.60	7.11	20.4	2.20	10.78	21.8	1.91	8.76
NC	3.0	0.42	14.00	3.1	0.10	3.23	2.8	0.12	4.12	3.0	0.25	8.33

TABLE 9 : Site #3 Intra-Assay and Interassay Precision (Manual)

SERUM	INTRA-ASSAY DAY 1			INTRA-ASSAY DAY 2			INTRA-ASSAY DAY 3			INTERASSAY		
	MEAN	SD	CV%	MEAN	SD	CV%	MEAN	SD	CV%	MEAN	SD	CV%
A	2.2	1.64	74.54	1.9	0.56	29.47	1.8	0.60	33.33	2.0	1.01	50.50
B	3.9	1.85	47.44	2.8	0.94	33.57	3.5	0.49	14.00	3.4	1.25	36.76
C	10.0	0.75	7.50	9.5	0.59	6.21	10.5	0.94	8.95	10.0	0.86	8.60
D	26.4	1.69	6.40	25.8	2.59	10.04	28.6	1.00	3.50	26.9	2.14	7.96
E	45.9	7.47	16.27	43.0	4.21	9.79	46.1	6.41	13.90	45.0	6.00	13.33
F	99.1	4.61	4.65	92.7	7.61	8.21	100.5	3.88	3.86	97.4	6.32	6.49
10 STD	9.6	1.05	10.94	9.2	0.67	7.28	9.9	0.59	5.96	9.6	0.81	8.44
HPC	96.1	12.08	12.57	94.7	9.67	10.21	96.6	11.66	12.07	95.8	10.54	11.00
LPC	24.9	2.53	10.16	24.0	0.88	3.67	25.6	1.34	5.23	24.8	1.76	7.10
NC	3.5	0.64	18.29	3.6	0.44	12.22	3.6	0.29	8.06	3.6	0.45	12.50

TABLE 10 : Site #3 Intra-assay and Interassay Precision (MAGO Plus)

SERUM	INTRA-ASSAY DAY 1			INTRA-ASSAY DAY 2			INTRA-ASSAY DAY 3			INTERASSAY		
	MEAN	SD	CV%	MEAN	SD	CV%	MEAN	SD	CV%	MEAN	SD	CV%
A	2.8	0.74	26.42	2.8	0.96	34.28	3.3	0.43	13.03	3.0	0.74	24.67
B	4.1	0.45	10.98	4.3	0.56	13.02	3.8	0.56	14.74	4.1	0.54	13.17
C	14.0	3.11	22.21	15.5	1.13	7.29	14.1	0.76	5.39	14.5	1.97	13.59
D	31.2	4.59	14.71	34.1	4.00	11.73	35.8	6.47	18.07	33.7	5.21	15.46
E	50.5	4.65	9.21	56.5	4.37	7.73	55.1	6.01	10.91	54.0	5.44	10.07
F	102.8	4.88	4.75	115.1	9.30	8.07	121.5	7.64	6.29	113.1	10.67	9.43
10 STD	10.3	1.36	13.20	10.3	0.77	7.48	11.9	0.68	5.71	10.8	1.19	11.02
HPC	108.6	8.67	7.98	109.5	3.69	3.37	111.9	9.38	8.38	110.0	7.35	6.68
LPC	30.2	3.46	11.46	32.1	2.70	8.41	30.1	1.52	5.05	30.8	2.70	8.77
NC	3.2	0.95	29.69	3.2	0.55	17.19	3.1	0.70	22.58	3.2	0.71	22.19

H. Expected Values

The prevalence of CMV 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. Sera from 100 healthy South Florida donors (52 female and 48 male) were evaluated in the Is-CMV IgG test Kit. Of the 100 samples, 70 were found to be positive, 29 were negative and 1 was equivocal for anti-CMV IgG. The resulting prevalence of 70% for this population is in general agreement with prevalence rates of 30% to 80% in US blood donors (2). Age distribution, geographic location and prevalence is provided in Table 1. Histograms demonstrating the distribution of EU/ml values are shown in Figures 1 and 2.

TABLE 1

	Number of donors	Prevalence
Total Number	100%	70%
Geographic location : South Eastern US	100	70%
Age		
10-19	13	38.5%
20-29	23	69.6%
30-39	40	67.5%
40-49	13	76.9%
50-59	5	100%
60-69	6	100%

FIGURE 1

Is-CMV IgG Positive Population

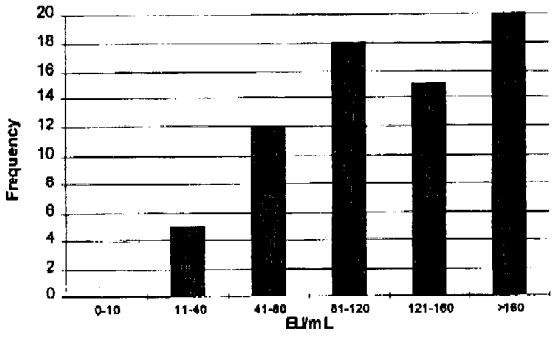
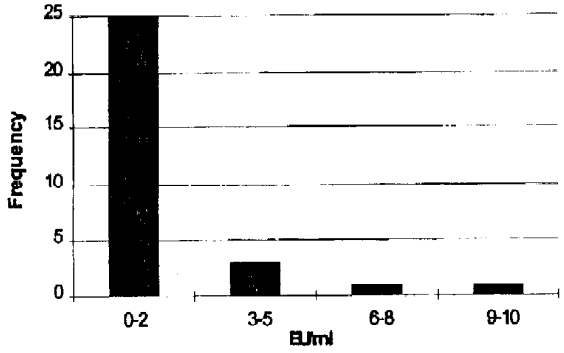


FIGURE 2

Is-CMV IgG Negative Population



DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Food and Drug Administration
2098 Gaither Road
Rockville MD 20850

SEP 21 1998

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

Re: K981163
Trade Name: Diamedix *Is*-CMV IgG Test System
Regulatory Class: II
Product Code: LFZ
Dated: July 6, 1998
Received: July 7, 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

ATTACHMENT 1

Appendix G Rev. Indications for Use Statement

INDICATIONS FOR USE STATEMENT

510(K) NUMBER : K981163

DEVICE NAME : Is-CMV IgG Test System

Indications for Use : The Diamedix Is-CMV IgG an Enzyme Immunoassay (EIA) for the qualitative and semi-quantitative determination of IgG antibodies in human serum by EIA to aid in the assessment of the patient's immunological response to CMV and to determine 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 infection, reactivated infection, or reinfection with CMV. These reagents can be used either manually or in conjunction with the MAGO® Plus Automated EIA Processor.

Woody Dubois

(Division Sign-Off)
Division of Clinical Laboratory Devices
510(k) Number K981163