K033064

NOV 2 6 2003

Summary of Safety and Effectiveness Information
Mycoplasma IgG ELISA Test Kit

I. Trinity Biotech
2823 Girts Road
Jamestown, NY 14701
Contact person: Bonnie B. DeJoy
Telephone: 716-483-3851
Date of preparation: Nov. 20, 2003

II. Description of Device

The Mycoplasma IgG ELISA kit is an Enzyme-Linked Immunosorbent Assay (ELISA) for semi-quantitative or qualitative determination of IgG antibodies in human serum to *Mycoplasma pneumoniae* for the determination of immunological experience. The Mycoplasma IgG ELISA kit may be used to evaluate paired sera for the presence of seroconversions and a significant increase in specific IgG as an aid in the diagnosis of *Mycoplasma pneumoniae* infection in the adult population. **For In Vitro Diagnostic Use Only.**

The Mycoplasma IgG ELISA test is an enzyme linked immunosorbent assay to detect IgG antibodies to *Mycoplasma pneumoniae*. Purified *Mycoplasma pneumoniae* antigen is attached to a solid phase microtiter well. Diluted test sera are added to each well. If the antibodies are present that recognize the antigen, they will bind to the antigen in the well. After incubation, the wells are washed to remove unbound antibody. An enzyme labeled anti-human IgG is added to each well. After incubation, the wells are washed to remove unbound conjugate. A substrate solution is added to each well. If enzyme is present, the substrate will undergo a color change. After an incubation period the reaction is stopped and the color intensity is measured photometrically, producing and indirect measurement of specific antibody in the patient specimen.

III. Predicate Device

The Mycoplasma IgG ELISA test is substantially equivalent to the IFA test. Equivalence is demonstrated by the following comparative results:

Performance Characteristics

% Agreement Positive and % Agreement Negative

Two different sites compared the Trinity Biotech Mycoplasma IgG ELISA test relative to a commercial IFA kit. The two sites were R&D laboratories at commercial companies located in Maryland and New York and affiliated with the manufacturer of the kit. The 187 frozen retrospective sera from the first study were from normal individuals of various ages, gender, from Lyme disease endemic and non-endemic areas. The results of the first study are summarized in Table 2. The 176 frozen retrospective sera from the second study were randomly selected sera from normal inividuals of various ages, gender, and geographical location. The results of the second study are summarized in Table 3. None of the performance characteristics were established with specimens from patients having documented mycoplasma infections.

Table 2
Comparison of Trinity Biotech Mycoplasma IgG ELISA and IFA
Study 1

Trinity Biotech Mycoplasma IgG ELISA

		+	eq	-	Total
	+	117	13	6	136
Mycoplasma IFA (1:32)	-	20*	6	25	51
	Total	137	19	31	187

% Agreement positive = 117/123 = 95.1% 95% Confidence interval = 91.2% - 99.0%
% Agreement negative = 25/45 = 55.6% 95% Confidence interval = 40.7% - 70.4%
% Agreement = 142/168 = 84.5% 95% Confidence interval = 78.19 - 90.1%

* All 20 sera were found to be positive by an alternate ELISA.
Equivocals were not included in the above calculations.
The 95% Confidence Intervals were calculated using the normal method.

Table 3
Comparison of Trinity Biotech Mycoplasma IgG ELISA and IFA
Study 2

Trinity Biotech Mycoplasma IgG ELISA

		+	eq	-	Total
	+	132	5	2	139
Mycoplasma IFA (1:32)	-	20*	0	17	37
	Total	152	5	19	176

% Agreement positive = 132/134 = 98.5% 95% Confidence interval = 96.4% - 100.0%
% Agreement negative = 17/37 = 45.9% 95% Confidence interval = 29.6% - 62.3%
% Agreement = 149/171 = 87.1% 95% Confidence interval = 82.0% - 92.3%

* All 20 sera were found to be positive by an alternate ELISA.
Equivocals were not included in the above calculations.
The 95% Confidence Intervals were calculated using the normal method.

Please be advised that "% agreement positive" and "% agreement negative" refer to the comparison of this 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.

Precision

Seven sera were assayed ten times each on three different assays at two different sites. Both sites were affiliated with the manufacturer of the kit. The intra- and inter-assay precision at each site is shown in Tables 4 and 5. The inter-site precision is shown in Table 6. With appropriate technique the user should obtain precision of < 15% CV.

Table 4
Mycoplasma IgG ELISA Intra- and Inter-Assay Precision Study 1

	Assay 1 (n=10)			Assay 2 (n=10)			Assay 3 (n=10)			Inter-Assay(n=30)		
Sera#	X	SD	CV	X	SD	CV	X	SD	CV	X	SD	CV
1	0.42	0.054	12.86%	0.36	0.033	9.18%	0.47	0.025	5.48%	0.42	0.054	13.02%
2	0.29	0.043	14.58%	0.23	0.026	11.38%	0.29	0.034	11.91%	0.27	0.043	15.93%
3	3.54	0.274	7.73%	3.24	0.244	7.53%	3.50	0.273	7.78%	3.43	0.274	7.98%
4	1.89	0.133	7.05%	1.76	0.142	8.09%	1.90	0.103	5.42%	1.85	0.133	7.21%
5	0.42	0.059	13.93%	0.33	0.051	15.21%	0.42	0.044	10.45%	0.39	0.059	15.02%
6	1.09	0.103	9.49%	1.03	0.088	8.56%	1.16	0.096	8.28%	1.09	0.103	9.45%
7	2.31	0.218	9.44%	2.21	0.286	12.98%	2.41	0.160	6.66%	2.31	0.218	9.46%
HPC										4.51	0.078	1.72*
Cal										2.50	0.072	2.89%**
LPC										1.31	0.135	10.33%*
NC										0.49	0.049	10.14%*

* n = 3
** n = 9

Table 5
Mycoplasma IgG ELISA Intra- and Inter-Assay Precision Study 2

	Assay 1 (n=10)			Assay 2 (n=10)			Assay 3 (n=10)			Inter-Assay(n=30)		
Sera#	X	SD	CV	X	SD	CV	X	SD	CV	X	SD	CV
1	0.23	0.013	5.74%	0.22	0.024	10.76%	0.25	0.028	11.04%	0.24	0.025	10.75%
2	0.17	0.022	12.71%	0.17	0.023	13.58%	0.19	0.018	9.45%	0.18	0.023	12.90%
3	3.58	0.199	5.56%	3.58	0.161	4.51%	3.70	0.154	4.17%	3.62	0.176	4.87%
4	1.84	0.102	5.57%	1.84	0.173	9.41%	2.07	0.135	6.55%	1.91	0.174	9.07%
5	0.35	0.016	4.54%	0.33	0.028	8.37%	0.37	0.029	7.90%	0.35	0.029	8.29%
6	1.15	0.070	6.09%	1.14	0.074	6.47%	1.27	0.078	6.15%	1.19	0.092	7.78%
7	2.22	0.147	6.64%	2.16	0.154	7.13%	2.31	0.105	4.56%	2.23	0.148	6.63%
HPC										3.48	0.191	5.48%*
Cal										2.51	0.056	2.21%**
LPC										1.43	0.140	9.78%
NC										0.13	0.03	23.08%

* n = 3
** n = 9

Table 6
Trinity Biotech Mycoplasma IgG ELISA Inter Site Precision Study

Inter-Assay

Sera#	X	SD	CV	n
1	0.33	0.101	30.89%	60
2	0.22	0.057	25.73%	60
3	3.52	0.247	7.01%	60
4	1.88	0.157	8.33%	60
5	0.37	0.050	13.43%	60
6	1.14	0.108	9.50%	60
7	2.27	0.189	8.34%	60
HPC	4.00	0.581	14.53%	6
CAL	2.51	0.063	2.50%	18
LPC	1.37	0.140	10.24%	6
NC	0.31	0.199	64.46%	6

A total of 456 determinations were made at the two sites. The only specimen to change status was # 6 which was positive 38 times and equivocal 22 times.

X = Mean
SD = Standard Deviation
CV = Coefficient of Variation = SD/X x 100

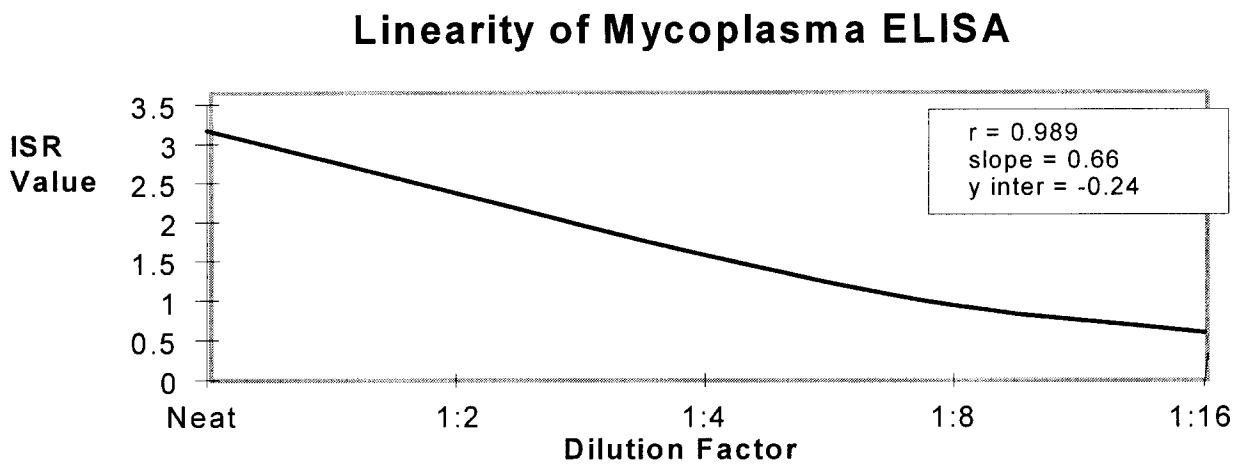
The methods in NCCLS EP5 were utilized for precision parameters.

Linearity

Simulated Paired Sera Evaluation
To evaluate the linearity of the assay 20 positive sera were serially two-fold diluted and run on the assay. The ISR values were compared to $\log_2$ of dilution by standard linear regression. The r values were all ≥ 0.974. The data indicate that the antibody can be semi-quantitated by using a single serum dilution. The detection of a significant antibody increase may be made only by an evaluation of paired specimens, acute and convalescent. To validate the % agreement positive of the paired sera procedure, the percent rise in ISR value was calculated for 56 pairs that had a four-fold dilution where the acute sera had a value of less than 2.18. All 56 pairs demonstrated a >46% rise in ISR value, showing a significant rise in antibody. Therefore, the paired sera procedure demonstrated 100% agreement positive in being able to detect a four-fold increase in antibody level when the acute sera has a value of ≤ 2.18.

Figure 1 illustrates the linearity of a representative serum. The ISR values were compared to $\log_2$ of dilution by standard linear regression

Figure 1



Complement Fixation Paired Serum Study

Eleven serum pairs tested by CF from patients suspected of having acute *Mycoplasma pneumoniae* infection were assayed on the Trinity Biotech Mycoplasma IgG ELISA assay. Each serum pair was evaluated to determine a significant rise in antibody. Four serum pairs could not be used due to the acute serum being too high. The remaining seven pairs all demonstrated a >46% rise in ISR values thus giving a 100% agreement positive versus CF for showing a significant rise in antibody for serum meeting the paired sera criteria.

Reproducibility Study

Fifty different sera with various levels of activity were assayed at three different sites. Two sites were R&D laboratories at commercial companies located in Maryland and New York. The third site was a large clinical laboratory located in Pennsylvania. The data from the three sites show good correlation with Pearson product moment correlation coefficients of >0.987 between the sites. Excluding equivocals (n = 4) one determination varied from its expected result (negative result for a positive specimen) giving a percent agreement of expected results between the three sites of 99.3% (145/146). The expected results were derived from previous Trinity Biotech ELISA testing of the samples. Three sera changed status in this study: one serum was equivocal at one site and negative at the other two sites; the second serum was equivocal at two sites and positive at the third; and the third serum was positive at one site, equivocal at second site, and negative at the third site.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Food and Drug Administration
2098 Gaither Road
Rockville MD 20850

NOV 26 2003

Ms. Bonnie B. DeJoy
Director, Quality Systems
Trinity Biotech USA
P.O. Box 1059
Jamestown, NY 14702-1059

Re: k033064
Trade/Device Name: Captia Mycoplasma IgG ELISA
Regulation Number: 21 CFR 866.3375
Regulation Name: Mycoplasma spp. serological reagents
Regulatory Class: Class II
Product Code: LON
Dated: May 14, 2003
Received: May 15, 2003

Dear Ms. DeJoy:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and 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) that do not require approval of a premarket approval application (PMA). 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 (PMA), it may be subject to such additional controls. Existing major regulations affecting your device can be found in Title 21, Code of Federal Regulations (CFR), Parts 800 to 895. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Parts 801 and 809); and good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820).

This letter will allow you to begin marketing your device as described in your Section 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 information about the application of labeling requirements to your device, or questions on the promotion and advertising of your device, please contact the Office of In Vitro Diagnostic Device Evaluation and Safety at (301) 594-3084. Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21CFR Part 807.97). Other general information on your responsibilities under the Act may be obtained from the Division of Small Manufacturers, International and Consumer Assistance at its toll-free number (800) 638-2041 or (301) 443-6597 or at its Internet address http://www.fda.gov/cdrh/dsma/dsmamain.html.

Sincerely yours,

Steven Gutman

Steven I. Gutman, M.D., M.B.A.
Director
Office of *In Vitro* Diagnostic Device
Evaluation and Safety
Center for Devices and
Radiological Health

Enclosure

510(k) Number: K033064

Device Name: Trinity Biotech Captia™ Mycoplasma IgG ELISA

Indications For Use: The Trinity Biotech Captia™ Mycoplasma IgG ELISA kit is an Enzyme-Linked Immunosorbent Assay (ELISA) for semi-quantitative or qualitative determination of IgG antibodies in human serum to *Mycoplasma pneumoniae* for the determination of immunological experience. The Mycoplasma IgG ELISA kit may be used to evaluate paired sera for seroconversions and the presence of a significant increase in specific IgG as and aid in the diagnosis of *Mycoplasma pneumoniae* infection in the adult population.

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

Concurrence of CDRH, Office of Device Evaluation (ODE)

Prescription Use ✓ (Per 21 XFR 801.109) OR Over-The-Counter Use____ (Optional Format 1-2-96)

Division Sign-Off

Office of In Vitro Diagnostic Device Evaluation and Safety

510(k) K033064