

510(k) SUBSTANTIAL EQUIVALENCE DETERMINATION DECISION SUMMARY

A. 510(k) Number:

K073501

B. Purpose for Submission:

To obtain a substantial equivalence determination for a new device.

C. Measurand:

Toxoplasma IgG antibodies

D. Type of Test:

Chemiluminescence immunoassay

E. Applicant:

Roche Diagnostics

F. Proprietary and Established Names:

Elecsys Toxo IgG Immunoassay and Elecsys PreciControl Toxo IgG

G. Regulatory Information:

1. Regulation section:

21CFR 866.3780; *Toxoplasma gondii* Serological Reagents
21CFR 862.1660; Quality control material (assayed and unassayed).

2. Classification: Class: II

3. Product code:

LGD; Enzyme Linked Immunosorbent Assay, *Toxoplasma gondii*
JJX; single (specified) analyte controls (assayed and unassayed).

4. Panel: 83 Microbiology

H. Intended Use:

The Elecsys Toxo IgG immunoassay: is for the *in vitro* quantitative determination of IgG antibodies to *Toxoplasma gondii* in human serum and Li-heparin, K3-EDTA and sodium citrate plasma. This test is intended for use as an aid in the assessment of immune status and as an aid in the diagnosis of

Toxoplasma gondii infection.

The electrochemiluminescence immunoassay “ECLIA” is intended for use on Elecsys and cobas e immunoassay analyzers.

Elecsys PreciControl Toxo IgG is used for quality control of the Elecsys Toxo IgG immunoassay on the Elecsys and cobas e immunoassay analyzers.

Caution: This assay has not been cleared/approved by the FDA for blood/plasma donor screening.

2. Indication(s) for use:

The Elecsys Toxo IgG immunoassay: is for the *in vitro* quantitative determination of IgG antibodies to *Toxoplasma gondii* in human serum and Li-heparin, K3-EDTA and sodium citrate plasma. This test is intended for use as an aid in the assessment of immune status and as an aid in the diagnosis of *Toxoplasma gondii* infection.

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3. Special conditions for use statement(s):

For prescription use

4. Special instrument requirements:

None

I. Device Description:

The Elecsys Toxo IgG is a two-step sandwich immunoassay with streptavidin microparticles and electrochemiluminescence detection. In the first incubation, 10 µL of sample, a biotinylated recombinant *T. gondii*-specific antigen, and a *T. gondii*-specific recombinant antigen labeled with a ruthenium complex to form a sandwich complex. After addition of streptavidin-coated microparticles, the complex becomes bound to the solid phase via interaction of biotin and streptavidin. The reaction mixture is aspirated into the measuring cell where the microparticles are magnetically captured onto the surface of the electrode. Unbound substances are then removed with ProCell. Application of a voltage to the electrode then induces chemiluminescent emission which is measured by a photomultiplier. Results are determined via a calibration curve which is instrument generated by a 2-point calibration and a master curve provided via the

reagent barcode. A human serum-based calibrator is provided with the test kit, and the recommended control material is PreciControl Toxo IgG.

The Elecsys PreciControl Toxo IgG contains two levels of human serum with Toxo IgG antibodies.

J. Substantial Equivalence Information:

1. Predicate device name(s):
VIDAS TOXO IgG II Test System
2. Predicate 510(k) number(s):
K993319
3. Comparison with predicate:

| Similarities | | |
|-----------------|--|---|
| Item | Device | Predicate |
| Intended Use | For the <i>in vitro</i> quantitative determination of IgG antibodies to <i>Toxoplasma gondii</i> in human serum and plasma | same |
| Differences | | |
| Item | Device | Predicate |
| Method and Type | Electrochemiluminescence Immunoassay (ECLIA) | Enzyme-linked fluorescent immunoassay (ELFA) |
| Instrumentation | Roche Elecsys 2010/cobas e 411 and Modular analytics E170 (Elecsys module)/cobas e 601 analyzers | VIDAS ® Instrument |
| Controls | PreciControl Toxo IgG (sold separately) | Positive and negative control included in kit |

K. Standard/Guidance Document Referenced (if applicable):

Not applicable

L. Test Principle:

Electrochemiluminescence immunoassay

M. Performance Characteristics (if/when applicable):

1. Analytical performance:

a. *Precision/Reproducibility:* Assay reproducibility studies were conducted using the Elecsys 2010/cobas e 411 analyzers and the Modular Analytics E-170/cobas e 601 analyzers. These studies were conducted at one US site, and 2 international sites. A panel of 3 samples and 2 controls and 21 replicates, were tested with one reagent lot on one Elecsys 2010 analyzer and also on one Modular Analytics E170 analyzer. For the within-run reproducibility, the tested samples consisted of one negative (-) and one positive (+) control and 1 positive human serum. These samples were tested six times per day as single determination (for the Elecsys 2010) and as six-fold determination (for the Modular Analytics E170 analyzer) – also called Total precision—with one reagent lot for a period of ten days. The study was conducted at three different geographical sites. Intra-assay and inter-assay data for Toxo IgG were within specification for all samples at all sites. The overall CV for the positive specimens ranged from 2-6% for both analyzers, which is acceptable.

b. *Linearity/assay reportable range:*

Not applicable

c. *Traceability, Stability, Expected values (controls, calibrators, or methods):*

Calibrators traceable to a World Health Organization standard

d. *Detection limit:*

Not applicable

e. *Analytical specificity:*

Cross-reactivity studies for the Elecsys Toxo IgG assay were conducted by evaluating potential interference from 193 IgG immunoglobulins specimens representing a variety of disease states (AMA, ANA, Chlamydia, CMV, EBV, Gonorrhea, HAV, HBV, HCV, HIV, HSV, Influenza, Malaria, Parvovirus B19, Rubella, Syphilis, TPAH, and VZV) as possible cross-reactants.

f. Assay cut-off:

Positive ≥ 3 IU/mL

Negative < 1 IU/mL

Equivocal (range): Repeat test if it falls within this range 1 - 2.99 IU/mL

2. Comparison studies:

a. Method comparison with predicate device:

Performance Evaluation in the U.S.

A total of 515 samples were obtained from a reference laboratory in the U.S. The initial storage conditions of the 515 samples were as follow: 512 were fresh serum, 2 were frozen serum, and one was frozen plasma. These samples represented subjects for whom anti-Toxoplasma testing had been ordered from a variety of institutions throughout the US. Specific geographic information about each sample was not collected. All samples were tested with the VIDAS Toxo IgG Assay, Sabin Feldman Dye Test, ELISA or AC/HS serological tests. After the completion of initial testing, all samples were stored frozen until any repeat and confirmatory testing required per the study protocol was completed:

| Vidas Toxo IgG Elycsys Toxo IgG | | | | |
|------------------------------------|----------|-----------|----------|-------|
| | Positive | Equivocal | Negative | Total |
| Positive | 183 | 2 | 7 | 192 |
| Equivocal | | | 13 | 13 |
| Negative | | | 310 | 310 |
| Total | 183 | 2 | 330 | 515 |

U.S. specimens – Percentage agreement with comparison VIDAS Toxo IgG

Positive: 100.0% (183/183) [98.0%-100%]

Negative: 93.40% (310/332) [95.5%- 99.1%]

Performance Evaluation in E.U.

Additional comparison studies and method comparison studies were done in E.U. All the samples used in the European studies were from patients referred to the lab for Toxoplasma testing. The European samples used for this studies ranged from a combination of retrospective and characterized studies (never-infected, previously infected, acute infected, remote infected and sero-conversions) in addition to routine fresh samples randomly collected. Retrospective samples consisted of frozen samples, whereas prospective

studies consisted of non-frozen, fresh samples.

| Vidas Toxo IgG \ Elycsys Toxo IgG | Positive | Equivocal | Negative | Total |
|-----------------------------------|----------|-----------|----------|-------|
| Positive | 151 | 4 | 20 | 175 |
| Equivocal | | | 4 | 4 |
| Negative | 1 | | 288 | 289 |
| Total | 152 | 4 | 312 | 468 |

Fresh serum samples (prospective study):

E.U. specimen – Percentage agreement with comparison VIDAS Toxo IgG

Positive: 99.3% (151/152) [96.4%-100%]

Negative: 91.1% (288/316) [87.5%- 94.0%]

Frozen serum samples (retrospective study):

| Vidas Toxo IgG \ Elycsys Toxo IgG | Positive | Equivocal | Negative | Total |
|-----------------------------------|----------|-----------|----------|-------|
| Positive | 378 | 2 | 10 | 390 |
| Equivocal | | | 3 | 3 |
| Negative | 1 | | 32 | 33 |
| Total | 379 | 2 | 45 | 426 |

E.U. specimen – Percentage agreement with comparison VIDAS Toxo IgG

Positive: 99.7% (378/379) [98.5%-100%]

Negative: 66.8% (32/47) [52.9%-80.9%]

CDC Panel Study: A panel of 100 samples was obtained through the US Centers of Disease Control and Prevention (CDC) and was tested for Toxo IgG on the Elecsys 2010 analyzer. As evaluated by the CDC, the Elecsys 2010 analyzer showed 100% agreement, with 70/70 positive tests on 70 positive sera and 30/30 negative tests on 30 negative sera.

The results are presented to provide further information on the performance of this assay with a masked, characterized serum panel. This does not imply an endorsement of the assay by the CDC.

b. Matrix comparison:

A total of 473 samples, obtained from blood donors and from patients during routine clinical testing, were tested on both the Elecsys 2010 analyzer and the Modular Analytics E170 analyzer. Samples had anti-Toxo IgG values ranging from 0 to > 650 IU/mL. The overall agreement rate was 100% (473/473).

3. Clinical studies:

a. Clinical Sensitivity:

Not applicable

b. Clinical specificity:

Not applicable

c. Other clinical supportive data (when a. and b. are not applicable):

Not applicable

4. Clinical cut-off:

Not applicable

5. Expected values/Reference range:

N. Proposed Labeling:

The labeling is sufficient and it satisfies the requirements of 21 CFR Part 809.10.

O. Conclusion:

The information submitted in this premarket notification is complete and supports a substantial equivalence decision

