510(k) SUBSTANTIAL EQUIVALENCE DETERMINATION
DECISION SUMMARY

A. 510(k) Number:

K103529

B. Purpose for Submission:

Addition of new assay instrument, the LIAISON XL Analyzer.

C. Measurand:

Antibodies to Hepatitis A (anti-HAV, total)

D. Type of Test:

Chemiluminescence Immunoassay

E. Applicant:

DiaSorin, Inc.
1951 Northwestern Ave.
Stillwater, MN 55082

F. Proprietary and Established Names:

LIAISON® Anti-HAV, Hepatitis A Test (Antibody)

G. Regulatory Information:

Product Code	Classification	Regulation Section	Panel
LOL	Class II	21 CFR 866.3310	Microbiology (83)
JJF	Class I	21 CFR 862.2170	Chemistry (75)

H. Intended Use:

1. Intended use(s):
The LIAISON® Anti-HAV assay is an *in vitro* chemiluminescent immunoassay intended for the qualitative detection of total antibodies to hepatitis A (anti-HAV) in human serum and sodium heparin plasma samples using the LIAISON® Analyzer family. The assay is indicated as an aid in the laboratory diagnosis of current or previous HAV infections in conjunction with other serological and clinical information and to determine the presence of an antibody response to HAV in vaccine recipients.

This assay is not intended for screening blood or solid or soft tissue donors. Assay performance characteristics have not been established for immunocompromised or immunosuppressed patients. The user is responsible for establishing assay performance characteristics in these populations. Caution: U.S. Federal Law restricts this device to sale by or on the order of a physician.

The LIAISON® XL Analyzer is an automated discrete continuous loading chemiluminescent immunoassay (CLIA) analyzer for *in vitro* diagnostic analysis of CLIAs on human serum or plasma. The system menu includes infectious disease, bone and mineral, and endocrinology CLIAs. It is to be used only with FDA cleared chemiluminescence immunoassays that are marketed by DiaSorin for the LIAISON XL Analyzer.

The LIAISON® Control Anti-HAV (negative and positive) is intended for use as assayed quality control samples to monitor the performance of the LIAISON® Anti-HAV assay.

The performance characteristics of LIAISON® controls have not been established for any other assays or instrument platforms different from LIAISON® and LIAISON® XL.

2. Indication(s) for use:

   Same as Intended Use

3. Special conditions for use statement(s):

   Prescription Use

4. Special instrument requirements:

   For use with the LIAISON Analyzer family

I. Device Description:

The method for qualitative determination of anti-HAV is a competitive sandwich chemiluminescence immunoassay (CLIA) based on neutralization. The assay uses magnetic particles (solid phase) coated with IgG antibodies to HAV (mouse monoclonal), and a mouse monoclonal anti- HAV antibody conjugate linked to an isoluminol derivative (isoluminol-antibody conjugate).

The first incubation step consists of adding the HAV antigen to calibrators, samples or controls, during which anti-HAV present in calibrators, samples or controls binds to a fixed and limited amount of HAV, thus forming an HAV-anti-HAV immune complex. After this step the second incubation follows and it involves addition of magnetic microparticles and conjugate into the reaction module, during which the antibody conjugate and the solid-phase antibody compete with anti-HAV present in the specimen for HAV, that allows the conjugate to bind to the solid phase and thus formation of a sandwich. If all HAV added is sequestered

in an HAV-anti-HAV immune complex during the first incubation, no sandwich is formed during the second incubation. After the second incubation, the unbound material is removed with a wash cycle.

Subsequently, the starter reagents are added and a flash chemiluminescence reaction is thus induced. The light signal, and hence the amount of isoluminol-antibody conjugate, is measured by a photomultiplier as relative light units (RLU) and is inversely indicative of anti-HAV present in calibrators, samples or controls.

The LIAISON XL Analyzer is an automated discrete continuous loading chemiluminescent immunoassay analyzer for *in vitro* diagnostic use. The analyzer consists of loading areas (for samples, reagents, cuvettes, and disposable tips), an incubator, wash station, photomultiplier reader, and a bar code reader for reagents and samples. The analyzer uses proprietary reagents in which chemiluminescence of an analyte is measured in a sample by the reaction of a magnetic particle solid phase coated with antigen or antibody and a chemiluminescent tracer. The LIAISON® XL Analyzer is intended for use in professional clinical laboratories only.

J. Substantial Equivalence Information:

1. Predicate device name(s):
   LIAISON Analyzer

2. Predicate 510(k) number(s):
   K032844/K082050

3. Comparison with predicate:

Similarities		
Item	Predicate	LIAISON XL Analyzer
Optical System	High-sensitive, low-noise photomultiplier tube (PMT) operating as an ultra-fast photon counter. Pulses are amplified by a rapid electronic amplifier.	Same
	Circuit that suppresses PMT signal noise.	Same
	Light peak of chemiluminescence emitted at 450 nm	Same
Test Processing	Random Access & Batch	Same
	Continuous operation	Same
	Sample scheduling optimized for throughput	Same
Assay Protocols	1-Step assays: 1 incubation sequence / 1 wash sequence; average incubation time = 10 minutes	Same
	2-Step assays: 2 incubation sequence / 1 or 2 wash sequence(s); average incubation time = 10 minutes	Same

Similarities		
Item	Predicate	LIAISON XL Analyzer
	Two-point assay calibration	Same
Sample Handling	Tube types: - primary tube - aliquot tube - pediatric	Same
	Sample presence, sample type (calibrator, control, patient), tube size, and processing completion tracked by operating software and sample barcode	Same
Dispense System	Automated pipetting of samples and reagents. Left pipetting unit used for samples; right pipetting unit used for reagents	Same

Differences		
Item	Predicate	LIAISON XL Analyzer
Temperature Control: o Reaction Temperature o Reagent Storage Temperature	36°C ± 1°C 12-19°C	36°C ± 1°C 11-15°C
Dispense Probes	Sample Probe: - Liquid Level Detection (capacitive) - Clot Detection feature (software algorithm based on capacitive signal)	Sample Probe (disposable tip): - Liquid Level Detection and Clot Detection feature (pressure)
	Reagent Probes: - Liquid Level Detection (capacitive), with software tracking of reagent level	Reagent Probes: - Liquid Level Detection (capacitive), with software tracking of reagent level - Optical Liquid Verification (real-time monitoring of liquid flow inside the probe)
Reagent Handling	Capacity: 15 Reagent Integrals (RI)	Capacity: 25 Reagent Integrals (RI), plus 4 positions for Ancillary Reagents
	Assay-specific processing and analysis parameters, calibration, lot number, expiration date, and usage (number of tests run) are controlled by operating software as communicated by barcode.	Assay-specific processing and analysis parameters, calibration, lot number, expiration date, and usage (number of tests run) are controlled by operating software as communicated by RF-Tag (RF-ID).
Reaction Modules	Capacity: 6 individual reaction compartments per Reaction Module	Single-cavity Cuvettes
	Storage capacity: maximum 120 strips stored in LIAISON stacker	Storage capacity: >600 Cuvettes
	Sensors detect presence of Reaction Modules, and loading and occupancy of stacker.	Inventory monitoring through software counter. Sensors detect actual presence of Cuvettes

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

CLSI EP15-A2, User Verification of Performance for Precision and Trueness; 2006

L. Test Principle:

Chemiluminescence Immunoassay (CLIA)

M. Performance Characteristics (as applicable):

1. Analytical performance:

a. Precision/Reproducibility:

A five-day reproducibility study was conducted at two external sites and at DiaSorin Inc. to assess the precision of the LIAISON XL Analyzer with the LIAISON Anti-HAV Assay.

5-Day Precision Study Results (3 sites)

Sample		mean conc	Within run		Between run (day)		Between site		overall	
ID#	N	ng/mL	SD	%CV	SD	%CV	SD	%CV	SD	%CV
KC 1*	60	148692.5	1737.0	1.2	4857.5	3.3	6217.41	4.2	7223.8	4.9
KC 2	60	0.5	0.01	1.3	0.02	3.6	0.004	0.9	0.02	5.1
Sample #1	59	2.5	0.03	1.2	0.08	3.1	0.06	2.2	0.09	3.6
Sample #2	60	2.3	0.04	1.7	0.06	2.7	0.05	2.3	0.10	4.4
Sample #3	60	1.2	0.02	1.7	0.05	3.7	0.03	2.3	0.05	4.0
Sample #4	60	0.8	0.01	1.5	0.02	3.1	0.00	0.4	0.03	3.9
Sample 5	60	0.6	0.01	2.4	0.06	10.0	0.01	1.6	0.09	14.9
Sample #6	60	0.3	0.01	2.8	0.03	8.4	0.01	2.4	0.05	15.0

** KC 1 dose was above the reading range of the assay. Precision calculations are based on signal (RLU) for this sample.*

b. Linearity/assay reportable range:
See K082049

c. Traceability, Stability, Expected values (controls, calibrators, or methods):
See K082049

d. Detection limit:
See K082049

e. Analytical specificity:
See K082049

f. Assay cut-off:
See K082049

2. Comparison studies:

a. Method comparison with predicate device:

A method comparison study was conducted testing 100 frozen serum or plasma samples on the LIAISON XL and the LIAISON Analyzers with the LIAISON Anti-HAV Assay. The samples were either selected or prepared by DiaSorin Inc. to reach different levels of anti-HAV antibody. The samples were randomly divided among 3 sites for testing. LIAISON XL testing was performed at 2 external sites and at DiaSorin Inc., with the LIAISON Analyzer testing performed internally at DiaSorin Inc.

	LIAISON Analyzer						
LIAISON XL Analyzer	Eqv (≥0.90 to ≤1.10)	High Neg (≥1.10 to <2.50)	High Pos (<0.100)	Low Pos (≥0.50 to <0.90)	Mod Pos (≥0.10 to <0.50)	Neg (>2.50)	Grand Total
High Neg (>1.10 to ≤2.50)		27				1	28
High Pos (<0.100)			32				33
Low Pos (≥0.50 to<0.90)	1	1		19			21
Mod Pos (≥0.10 to <0.50)				1	17		18
Neg (>2.50)							
Grand Total	1	28	32	20	18	1	100

b. Matrix comparison:

See K082049

3. Clinical studies:

a. Clinical Sensitivity:

See K082049

b. Clinical specificity:

See K082049

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

See K082049

4. Clinical cut-off:

See K082049

5. Expected values/Reference range:

See K082049

N. Instrument Name: LIAISON XL Analyzer

O. System Descriptions:

1. Modes of Operation:

   Operates in batch or random access mode.

2. Software:

   FDA has reviewed applicant's Hazard Analysis and software development processes for this line of product types:

   Yes ___X___ or No _____

3. Specimen Identification:

   Barcode

4. Specimen Sampling and Handling:

   Sample presence, sample type (calibrator, control, patient), tube size, and processing completion tracked by operating software and sample barcode.

5. Calibration:

   Assay-specific calibrations are performed as required per package insert instructions.

6. Quality Control:

   The use of quality control material is described in each specific assay package insert that uses the LIAISON® XL Analyzer.

P. Other Supportive Instrument Performance Characteristics Data Not Covered In The "Performance Characteristics" Section above: Not applicable

Q. Proposed Labeling:

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

R. Conclusion:

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