510(k) SUBSTANTIAL EQUIVALENCE DETERMINATION
DECISION SUMMARY
ASSAY AND INSTRUMENT

I Background Information:

A 510(k) Number

K193532

B Applicant

DiaSorin Inc.

C Proprietary and Established Names

Liaison Anti-HAV

D Regulatory Information

Product Code(s)	Classification	Regulation Section	Panel
LOL	Class II	21 CFR 866.3310 - Hepatitis A Virus (HAV) Serological Assays	MI - Microbiology
JJE	Class I	21 CFR 862.2160 - Discrete photometric chemistry analyzer for clinical use	CH - Clinical Chemistry

II Submission/Device Overview:

A Purpose for Submission:

For addition of a new instrument family per FDA *Replacement Reagent and Instrument Family Policy*; the LIAISION XS Analyzer.

B Measurand:

Total antibodies to Hepatitis A Virus (Anti-HAV)

C Type of Test:

Competitive Chemiluminescent Immunoassay

III Intended Use/Indications for Use:

A Intended Use(s):
See Indications for Use below.

B Indication(s) for Use:
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.

C Special Conditions for Use Statement(s):
Rx - For Prescription Use Only

D Special Instrument Requirements:

For use with the LIAISON, LIAISON XL, or the LIAISON XS Analyzer.

IV Device/System Characteristics:

A Device Description:

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. No changes were made to the assay to run it on the LIAISON XS Analyzer (see K082049, K103529).

B Principle of Operation:

The LIAISON Anti-HAV assay 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. In the next step magnetic microparticles and conjugate are added into the cuvette. During this incubation the antibody conjugate and the solid-phase antibody compete with anti-HAV present in the specimen for HAV which allows the

conjugate to bind to the solid phase and form 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 induced. The light signal, proportional to the amount of isoluminol-antibody conjugate, is measured by a photomultiplier as relative light units (RLU) and is inversely relative to the anti-HAV present in samples, calibrators, or controls.

The LIAISON XS Analyzer is a benchtop, automated, closed, continuous samples and reagents-loading *in vitro* diagnostic immunoassay system utilizing chemiluminescent technology to provide rapid sample results. The LIAISON XS Analyzer has the same basic design, performance characteristics, intended use, and function as the LIAISON XL Analyzer, employing the same chemiluminescent reaction measurement technology and Reagent Integrals.

C Instrument Description Information:

Modes of Operation	**Yes**	**No**
Does the applicant's device contain the ability to transmit data to a computer, webserver, or mobile device?	☒	☐
Does the applicant's device transmit data to a computer, webserver, or mobile device using wireless transmission?	☐	☒
Software		
FDA has reviewed applicant's Hazard Analysis and software development processes for this line of product types.	☒	☐

1. Instrument Name:

   LIAISON XS Analyzer

2. Specimen Identification:

   A barcode reader reads the barcodes on each tube for positive identification.

3. Specimen Sampling and Handling:

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

4. Calibration:

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

5. Quality Control:

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

V Substantial Equivalence Information:

A Predicate Device Name(s):
Liaison Anti-HAV Assay, Liaison Control Anti-HAV

B Predicate 510(k) Number(s):
K082049

C Comparison with Predicate:

VI Standards/Guidance Documents Referenced:

CLSI EP05-A3 *Evaluation of Precision of Quantitative Measurement Procedures*, 3rd Edition
FDA Guidance *Replacement Reagent and Instrument Family Policy*, 12/11/2003

VII Performance Characteristics (if/when applicable):

A Analytical Performance:

1. Precision/Reproducibility:
   A reproducibility/precision study was conducted at two external laboratories and at DiaSorin Inc. (Stillwater, Minnesota 55082-0285, U.S.A.) to verify the precision of the LIAISON XS Analyzer with the LIAISON XS Anti-HAV Assay.

   A coded panel comprised of 7 frozen serum samples was distributed to the testing sites. The coded panel samples were prepared by pooling samples with similar anti-HAV titers in order to represent negative, borderline and positive levels. The LIAISON Anti-HAV controls were also included in the twelve-day study. The coded panel was tested at all three sites, in a single run, four replicates per day, with one reagent lot, at least two operators per site, for 12 days.

   The mean Index value, standard deviation, and coefficient of variation (%CV) of the results were computed for each of the tested specimens for each of the sites and across sites.

   Precision Study Results (all sites combined)

Sample Description	Mean	N	Repeatability (within Day)		Between Day		Between Laboratory		Reproducibility (Total)	
			SD	%CV	SD	%CV	SD	%CV	SD	%CV
Negative Control	175186*	144	3012	1.7%	6194	3.5%	3757	2.1%	7846	4.5%
Positive Control	0.43	144	0.011	2.4%	0.020	4.7%	0.020	4.6%	0.030	7.0%
Sample 1	0.23	144	0.005	2.1%	0.010	4.6%	0.011	5.0%	0.016	7.1%
Sample 2	0.48	144	0.008	1.8%	0.029	6.0%	0.000	0.0%	0.030	6.3%
Sample 3	0.51	144	0.008	1.6%	0.021	4.2%	0.012	2.3%	0.026	5.1%
Sample 4	0.91	144	0.015	1.7%	0.049	5.3%	0.032	3.5%	0.060	6.6%

Sample Description	Mean	N	Repeatability (within Day)		Between Day		Between Laboratory		Reproducibility (Total)	
			SD	%CV	SD	%CV	SD	%CV	SD	%CV
Sample 5	2.09	144	0.026	1.3%	0.085	4.1%	0.025	1.2%	0.092	4.4%
Sample 6	1.71	144	0.026	1.5%	0.105	6.2%	0.004	0.2%	0.108	6.3%
Sample 7	0.94	144	0.018	1.9%	0.035	3.7%	0.041	4.3%	0.057	6.0%

*Negative Control is expressed in RLU because it is out of the Assay Range

2. Linearity:

   Not applicable

3. Analytical Specificity/Interference:

   See K082049

4. Assay Reportable Range:

   See K082049

5. Traceability, Stability, Expected Values (Controls, Calibrators, or Methods):

   See K082049

6. Detection Limit/Analytical Sensitivity:

   An analytical sensitivity study was performed using a secondary standard titrated against the WHO International Standard for Anti-Hepatitis A, Immunoglobulin, Human. The study was performed to demonstrate that the minimum level of analyte detected was comparable between the assay run on the LIAISON XL vs on the LIAISON XS. Results obtained from serial dilutions of the secondary standard tested with the LIAISON Anti-HAV on the LIAISON XS were plotted. The concentration at the assay cutoff, corresponding to the assay analytical sensitivity, was calculated by interpolation and the mean value obtained was 18 mIU/mL. The result fell within the acceptance range of 15.5 – 21.5 mIU/mL, which is the same criteria for the assay on the LIAISON XL.

7. Assay Cut-Off:

   See K082049

8. Accuracy (Instrument):

   See K082049

9. Carry-Over:

   Not indicated. The LIAISON XS analyzer utilizes the same pipetting technology as the LIAISON XL analyzer.

B Comparison Studies:

1. Method Comparison with Predicate Device:

   A Method Comparison study was conducted to demonstrate equivalent performance of the LIAISON Anti-HAV assay when run on either the LIAISON XL or the LIAISON XS analyzer. The study consisted of testing 100 frozen serum samples on the LIAISON XS and the LIAISON XL 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 (2 external and 1 internal) for testing, with testing on the LIAISON XL Analyzer performed internally at DiaSorin Inc.

Sample Distribution by Reactivity

Sample Category	Index Results Range*	Number of Samples	% of TOTAL
Negative	>2.70	14	14.0%
High Negative	>1.10 to ≤2.70	24	24.0%
Equivocal	≥0.90 to ≤1.10	2	2.0%
Low Positive	≥0.50 to <0.90	19	19.0%
Moderate Positive	≥0.10 to <0.50	18	18.0%
High Positive	<0.100	23	23.0%
	TOTAL	100	

*NOTE: LIAISON Anti-HAV Assay is a competitive reaction, resulting in increasing S/CO for increasing negative samples and decreasing S/CO for decreasing positive samples

The results are as follows:

		LIAISON XL			
		Negative	**Equivocal**	**Positive**	**Total**
LIAISON XS	**Negative**	38	0	0	38
	Equivocal	0	1	2	3
	Positive	0	1	58	59
	Total	38	2	60	100

Negative Agreement: 97.4% (38/39) 95% CI: 86.8% to 99.5%

Positive Agreement: 96.7% (58/60) 95% CI: 88.6% to 99.1%

2. Matrix Comparison:

   See K082049

C Clinical Studies:

1. Clinical Sensitivity:

   See K082049

2. Clinical Specificity:

   See K082049

3. Other Clinical Supportive Data (When 1. and 2. Are Not Applicable):

   See K082049

D Clinical Cut-Off:

Not applicable.

E Expected Values/Reference Range:

See K082049

F Other Supportive Instrument Performance Characteristics Data:

Adequate supporting software information, verification/validation testing and results, and results from analytical testing were provided. These data demonstrate acceptable instrument performance.

VIII Proposed Labeling:

The labeling supports the finding of substantial equivalence for this device.

IX Conclusion:

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