510(k) SUBSTANTIAL EQUIVALENCE DETERMINATION
DECISION SUMMARY
ASSAY ONLY

I Background Information:

A 510(k) Number

K243483

B Applicant

Beckman Coulter Inc.

C Proprietary and Established Names

Access hsTnI

D Regulatory Information

Product Code(s)	Classification	Regulation Section	Panel
MMI	Class II	21 CFR 862.1215 - Creatine Phosphokinase/Creatine Kinase Or Isoenzymes Test System	CH - Clinical Chemistry

II Submission/Device Overview:

A Purpose for Submission:

Modification of an existing device

B Measurand:

Cardiac Troponin I

C Type of Test:

Quantitative Immunoassay

III Intended Use/Indications for Use:

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

B Indication(s) for Use:
Access hsTnI is a paramagnetic particle, chemiluminescent immunoassay for the quantitative determination of cardiac troponin I (cTnI) levels in human serum and plasma using the UniCel DxI Immunoassay Systems to aid in the diagnosis of myocardial infarction (MI).

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

D Special Instrument Requirements:

UniCel DxI 800 Immunoassay System

IV Device/System Characteristics:

A Device Description:

Same as described in K172783

B Principle of Operation:

The principle of operation is unchanged from the previous clearance described in K172783. The device has been modified to resolve intra-assay carryover (Access hsTnI assay to Access hsTnI assay carryover) by improving the washing capabilities of the candidate test system.

V Substantial Equivalence Information:

A Predicate Device Name(s):
Access hsTnI

B Predicate 510(k) Number(s):
K230648

C Comparison with Predicate(s):

Device & Predicate Device(s):	K243483	K230648
Device Trade Name	Access hsTnI	Access hsTnI
General Device Characteristic Similarities		
Intended Use/Indications For Use	Quantitative determination of cardiac troponin I (cTnI) levels in human serum and plasma to aid in the diagnosis of myocardial infarction (MI).	Same
Assay Principle	Chemiluminescent sandwich assay	Same
Sample Type	Serum and Lithium Heparin plasma	Same
Open Reagent Pack Stability	Stable at 2 - 10°C for 64 days after opening	Same
Dilution Factor/Recovery Extended Recovery Range	1:5 up to >150,000 pg/mL	Same
General Device Characteristic Differences		
Instrument	UniCel DxI 800 Immunoassay Systems	Access 2 Immunoassay Systems

VI Standards/Guidance Documents Referenced:

1. CLSI EP06-Ed2: Evaluation of the Linearity of Quantitative Measurement Procedures: A Statistical Approach; Approved Guideline
2. CLSI EP17-A2: Evaluation of Detection Capability for Clinical Laboratory Measurement Procedures; Approved Guideline – Second Edition
3. CLSI EP05-A3: Evaluation of Precision of Quantitative Measurement Procedures; Approved Guideline – Third Edition
4. CLSI EP09c: Measurement Procedure Comparison and Bias Estimation Using Patient Samples; Approved Guideline – Third Edition

VII Performance Characteristics (if/when applicable):

A Analytical Performance:

1. Precision/Reproducibility:
   The sponsor evaluated precision of the Access hsTnI assay on the UniCel DxI 800 Immunoassay system in several studies following the recommendations in CLSI EP5-A3. Four lithium heparin plasma samples with troponin concentrations spanning the assay dynamic range were each tested on a single DxI 800 in duplicate, in two runs per day, over 20 days for a total of 40 runs and a minimum of 80 replicates per platform using a single reagent pack lot at a single site. All four samples used were unique pools of native patient samples. The two highest concentration samples (999 and 13,309 pg/mL targets) were spiked with a natively sourced troponin. The within-laboratory (total) imprecision includes within-run (repeatability), between-run, and between-day variance components. Variance components analysis was used to estimate within-run, between run, and between-day, %CV and SD. Results for this study are shown below:

DxI 800 Imprecision Analysis and Results Summary								
hsTnI Summary:	Within run		Between-Run		Between-Day		Within-Laboratory (Total)	
Sample Concentration Mean (pg/mL)	SD	CV	SD	CV	SD	CV%	SD	CV
12.4	0.4	2.85	0.33	2.21	0.2	1.43	0.5	3.87
25.3	0.632	2.46	0.4	1.47	0.4	1.68	0.8	3.32
998.8	25.424	2.55	8.9	0.90	14.7	1.47	30.69	3.07
13308.6	413.53	3.11	294.9	2.22	289.8	2.18	584.74	4.39

   The results of the study support that the enhanced washing protocol did not impact the precision of the test system.

2. Linearity:

   The sponsor evaluated the linearity of the Access hsTnI assay on the DxI 800 instrument following the recommendations in CLSI EP06-A2 using both serum and lithium heparin plasma sample types covering the full range of the assay. The results of the study demonstrate that the mitigation (the enhanced washing procedure) did not impact the linearity of the test system.

   Hook Effect:
   Same as described in K172783.

3. Analytical Specificity/Interference:

   The Analytical Specificity/Interference performance was evaluated in K172783 and the claims are unchanged.

4. Assay Reportable Range:

2.3 - 27,027 pg/mL

The sponsor performed studies to evaluate intra-assay carryover and included the following limitation in the labeling:

Studies indicate that if a sample with cTnI > 150,000 pg/mL (ng/L) is tested on a UniCel DxI 800 system, intra-assay carryover may be observed if Access hsTnI is tested after the high cTnI sample. The extent of carryover observed is directly proportional to the cTnI concentration that is present in the high sample. In studies, the estimated carryover was 3-5 pg/mL (ng/L) from a high sample at 270,000 pg/mL (ng/L) and 5-8 pg/mL (ng/L) from a high sample at 500,000 pg/mL (ng/L).

Additionally, to address inter-assay carryover, a limitation statement was added to the Access hsTnI IFU to inform customers of the risk:

When a sample containing high cardiac troponin (cTnI) >27,000 pg/mL (ng/L) is tested on an Access Immunoassay assay other than Access hsTnI assay, carryover of cTnI may be observed if the next test performed, using the same probe on that instrument, is Access hsTnI on a different sample. This form of carryover has been ***observed in the sample immediately following, and up to the third subsequent sample*** *processed after the high cTnI sample. The magnitude of carryover observed is directly proportional to the cTnI concentration present in the high sample. The magnitude of carryover observed is directly proportional to the cTnI concentration present in the high sample. Representative data for the potential magnitude of carryover from samples with different concentrations of cTnI tested is provided below:*

High cTnI Concentration (pg/mL)	*Observed Carryover Magnitude (pg/mL)*
~27,000	*2.5*
~50,000	*3.2*
~110,000	*3.6*
~150,000	*4.5*
~270,000	*7.6*
~500,000	*39.6*
~1,000,000	*67.7*

To reduce the risk of inter-assay carryover when testing Access hsTnI on the UniCel DxI 800, it is strongly recommended to test all Access hsTnI samples on a dedicated reagent probe, separate from other Access Immunoassays.

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

   Traceability and stability is the same as described in K172783.

6. Detection Limit:

   Studies were performed to determine the Limit of Blank (LoB), Limit of Detection (LoD) and Limit of Quantitation (LoQ) for the Access hsTnI assay on the DxI 800 instrument using the recommendations in CLSI EP17-A2. Blank samples were used in the LoB studies, lithium heparin samples and serum samples were used in the LoD and LoQ studies. The results provided for LoB, LoD, and LoQ support the claimed measuring range of 2.3-27,027 pg/mL.

7. Assay Cut-Off:

   Not applicable.

B Comparison Studies:

1. Method Comparison with Predicate Device:
   A method comparison study was conducted to assess the impact of the modification using a protocol based on CLSI EP09c.

   The method comparison study evaluated 119 Lithium Heparin Plasma and 120 Serum samples across three (3) UniCel DxI 800 Immunoassay Systems using a single reagent lot and a single calibrator lot. Each sample was measured using the proposed test system and the predicate test system. Each sample was measured in duplicate. The first replicate result from each sample was utilized to fit a Passing-Bablok linear regression model. Representative results are shown below:

Instrument	Sample Type	Sample #	Claimed Range	Range of Samples	Regression Equation	Correlation coefficient (R)
DxI 800	Lithium Heparin Plasma	119	2.3 – 27,027	3.09 – 23005.50	y = -0.4714 + 1.011 x	1
	Serum	120		2.87 – 24801.24	y = 0.04789 + 1.016 x	1

   The results of the method comparison study (including analyses around the cutoffs) show that the performance of the assay is unchanged since its clearance in K172783.

2. Thermal Method Comparison:
   The sponsor also performed thermal method comparison studies that show that the performance of the candidate device at different calibration and run temperature conditions is unchanged from K172783.

2. Matrix Comparison:
   The sponsor provided information to support that the modification to the candidate device did not impact the matrix comparison performance claims described in K172783.

C Clinical Studies:

1. Clinical Sensitivity:

   The sponsor provided information to support that the modification to the candidate device did not impact the clinical performance claims described in K172783.

2. Clinical Specificity:

   See Clinical Sensitivity above.

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

   Not applicable.

D Clinical Cut-Off:

The sponsor provided information to support that the modification to the candidate device did not impact the clinical cutoffs described in K172783.

E Expected Values/Reference Range:

The sponsor provided information to support that the modification to the candidate device did not impact the 99th percentile upper reference limits described in K172783.

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.