510(k) SUBSTANTIAL EQUIVALENCE DETERMINATION
DECISION SUMMARY
ASSAY ONLY

I Background Information:

A 510(k) Number
K232791

B Applicant
Beckman Coulter, Inc.

C Proprietary and Established Names
Access Intact PTH

D Regulatory Information

Product Code(s)	Classification	Regulation Section	Panel
CEW	Class II	21 CFR 862.1545 - Parathyroid Hormone Test System	CH - Clinical Chemistry

II Submission/Device Overview:

A Purpose for Submission:
Modified device

B Measurand:
Parathyroid Hormone

C Type of Test:
Quantitative, Immunoenzymatic assay

III Intended Use/Indications for Use:

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

B Indication(s) for Use:
The Access Intact PTH assay is a paramagnetic particle, chemiluminescent immunoassay for the quantitative determination of intact parathyroid hormone (parathyrin, PTH) levels in human serum and plasma using the Access Immunoassay Systems. It is indicated to aid in the differential diagnosis of hyperparathyroidism, hypoparathyroidism, or hypercalcemia of malignancy and can be used intraoperatively. Assay results should be used in conjunction with other clinical data to assist the clinician in making individual patient management decisions.

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

D Special Instrument Requirements:
DxI 9000 Access Immunoassay Analyzer

IV Device/System Characteristics:

A Device Description:
The device consists of the components described below.

Access Intact PTH (iPTH) Reagent Pack:

- R1a: 3.25 mL, Paramagnetic particles coated with goat anti-PTH antibody suspended in TRIS buffered saline with bovine serum albumin (BSA), surfactant, < 0.1% sodium azide, 0.1% ProClin 300.
- R1b: 3.1 mL, TRIS buffered saline with block ACE, protein (mouse, goat), surfactant, < 0.1% sodium azide, 0.1% ProClin 300.
- R1c: 3.1 mL, Mouse monoclonal anti-PTH alkaline phosphatase conjugate in ACES buffered saline with BSA, surfactant, < 0.1% sodium azide, 0.1% ProClin 300.

Materials Required but Not Provided
The Beckman Coulter Access Intact PTH (iPTH) Assay is designed for use in conjunction with the following products:

- Access Intact PTH Calibrators
- Lumi-Phos PRO Substrate
- Unicell Dxl Wash Buffer II
- Access Sample Diluent A

B Principle of Operation:
The Access Intact PTH assay is a paramagnetic particle, chemiluminescent immunoassay for the quantitative determination of intact parathyroid hormone (parathyrin, PTH) levels in human serum and plasma using the Access Immunoassay Systems. The assay principle uses a two-site immunoenzymatic ("sandwich") assay, where a sample (55 µL) is added to a reaction vessel, along with a monoclonal anti-PTH antibody conjugated to alkaline phosphatase, TRIS buffered saline with proteins and paramagnetic particles coated with a goat polyclonal anti-PTH antibody. Samples may be run in one of two modes: routine mode (≤ 30 minutes from start of sample pipetting to test result) and intraoperative mode (≤ 15 minutes from start of sample pipetting to test result). After incubation, materials bound to the solid phase are held in a magnetic field while unbound materials are washed away. Then, the chemiluminescent substrate is added to the vessel and light generated by the reaction is measured with a luminometer. The light production is directly proportional to the concentration of analyte in the sample. Analyte concentration is automatically determined from a stored calibration.

V Substantial Equivalence Information:

A Predicate Device Name(s):
Access Intact PTH

B Predicate 510(k) Number(s):
K061190

C Comparison with Predicate(s):

Device & Predicate Device(s):	K232791	K061190
Device Trade Name	Access Intact PTH assay	Access Intact PTH assay
General Device Characteristic Similarities		
Intended Use/Indications For Use	Quantitative determination of intact parathyroid hormone (parathyrin, PTH) levels in human serum and plasma. It is indicated to aid in the differential diagnosis of hyperparathyroidism, hypoparathyroidism, or hypercalcemia of malignancy and can be used intraoperatively.	Same
Sample type	Serum or Plasma (Heparin and EDTA)	Same
General Device Characteristic Differences		
Measuring range	1.7 – 3,500 pg/mL	1 – 3,500 pg/mL
Substrate	Lumi-Phos PRO Substrate	Access Substrate
Analyzer platform	DxI 9000 Access Immunoassay Analyzer	Access 2 Immunoassay system

VI Standards/Guidance Documents Referenced:

- Clinical & Laboratory Standards Institute (CLSI) EP05-A3 Evaluation of Precision of Quantitative Measurement Procedures; Approved Guideline - Third Edition
- CLSI EP09c 3rd Edition Measurement Procedure Comparison and Bias Estimation Using Patient Samples
- CLSI EP17-A2 Evaluation of Detection Capability for Clinical Laboratory Measurement Procedures; Approved Guideline - Second Edition
- CLSI EP06-2nd Edition Evaluation of the Linearity of Quantitative Measurement Procedures: A Statistical Approach; Approved Guideline

VII Performance Characteristics (if/when applicable):

A Analytical Performance:

1. Precision/Reproducibility:

Routine Mode:

A precision study was performed in accordance with CLSI EP05-A3. Five serum samples with PTH concentrations spanning the analytical range were tested using three reagent lots on three DxI 9000 Access Immunoassay Analyzers. Samples were assayed in duplicate using 2 runs per day over 20 days for a total of 80 replicates per sample per lot. Results from multiple lots were similar. Within-run (repeatability), within-lab (total), between-run, and between-day precision results for a representative reagent lot on a single instrument are summarized below:

Concentration (pg/mL)			Repeatability (Within-run)		Between-run		Between-day		Within- Laboratory (Total)	
Sample	N	Mean pg/mL	SD pg/mL	%CV	SD pg/mL	%CV	SD pg/mL	%CV	SD pg/mL	%CV
SAMPLE 1	86	7.8	0.19	2.4	0.10	1.2	0.41	5.2	0.46	5.9
SAMPLE 2	86	12	0.48	3.9	0.40	3.3	0.48	4.0	0.79	6.5
SAMPLE 3	86	89	2.1	2.3	2.1	2.3	2.4	2.7	3.8	4.3
SAMPLE 4	86	1369	44.2	3.2	15.4	1.1	18.3	1.3	50.3	3.7
SAMPLE 5	84	2449	48.9	2.0	14.2	0.6	40.8	1.7	65.2	2.7

Intraoperative Mode:

A precision study was performed in accordance with CLSI EP05-A3. Seven serum samples were tested using three reagent lots on three DxI 9000 Access Immunoassay Analyzers. Seven serum samples with PTH concentrations spanning the analytical range were assayed in duplicate using 2 runs per day over 20 days for a total of 80 replicates per sample per lot. Results from multiple lots were similar. Within-run (repeatability), within-lab (total), between-run, and between-day precision results for a representative reagent lot on a single instrument are summarized below:

Concentration (pg/mL)			Repeatability (Within-run)		Between-run		Between-day		Within- Laboratory (Total)	
Sample	N	Mean pg/mL	SD pg/mL	%CV	SD pg/mL	%CV	SD pg/mL	%CV	SD pg/mL	%CV
SAMPLE 1	88	1.7	0.15	8.6	0.13	7.3	0.12	6.9	0.23	13.2
SAMPLE 2	88	6.6	0.27	4.1	0.03	0.4	0.19	2.9	0.33	5.0
SAMPLE 3	88	14	0.6	4.0	0.0	0.0	0.4	2.7	0.7	4.8
SAMPLE 4	88	34	1.3	4.0	0.0	0.0	0.5	1.4	1.4	4.2
SAMPLE 5	88	169	5.5	3.3	3.1	1.8	2.4	1.4	6.8	4.0
SAMPLE 6	88	1014	41.7	4.1	0.0	0.0	13.1	1.3	43.8	4.3
SAMPLE 7	88	2542	72.3	2.8	41.7	1.6	0.0	0.0	83.5	3.3

2. Linearity:
   Linearity studies were performed using serum samples across the assay measuring range to evaluate the linearity of the Access Intact PTH assay on the DxI 9000 Access Immunoassay Analyzer in accordance with the CLSI Guideline EP06-Ed2. The data was analyzed using a weighted linear regression model. The deviation from linearity for the routine mode did not exceed 5% and for the intraoperative mode, did not exceed 8%.

   The results of these linearity studies support that the Access Intact PTH assay is linear on the DxI 9000 Access Immunoassay Analyzer throughout the proposed analytical measuring interval of 1.7 – 3,500 pg/mL.

3. Analytical Specificity/Interference:
   Interference was previously established in K061190. The sponsor provided information to support that biotin up to 3500 ng/mL does not interfere with the test.

4. Assay Reportable Range:
   See Linearity section above.

5. Traceability, Stability, Expected Values (Controls, Calibrators, or Methods):
   The Access Intact PTH assay is traceable to international WHO standard 79/500.

6. Detection Limit:
   Limit of Blank (LoB), Limit of Detection (LoD), and Limit of Quantitation (LoQ) were evaluated based on the CLSI guideline EP17-A2. The LoQ was defined as the lowest concentration of analyte which has imprecision less than or equal to 20% CV.

The LoB, LoD, and LoQ results are summarized below:

Mode	LoB	LoD	LoQ
Routine	0.5 pg/mL	0.7 pg/mL	0.7 pg/mL
Intraoperative	0.5 pg/mL	0.8 pg/mL	0.8 pg/mL

7. Assay Cut-Off:
   Not applicable.

B Comparison Studies:

1. Method Comparison with Predicate Device:
   Routine Mode:
   A method comparison study was completed to compare the candidate device to the predicate device in routine mode in accordance with CLSI EP09c 3rd Edition. Weighted Deming analysis was performed, and the results are summarized below.

N	Sample range tested (pg/ml)	Slope	Intercept (pg/mL)	Correlation Coefficient (r)
144	1.9 - 3233	0.97	-0.23	1.00

Intraoperative Mode:
A method comparison study was completed to compare the Access PTH Intraoperative mode (PTH-IO) assay on DxI 9000 Access Immunoassay Analyzer to the predicate device, the Access PTH assay (Routine mode) on the Access 2 Immunoassay System in accordance with CLSI EP09c 3rd Edition. Weighted Deming analysis was performed, and the results are summarized below.

N	Sample range tested (pg/ml)	Slope	Intercept (pg/mL)	Correlation Coefficient (r)
116	2.1-3275	1.02	-0.081	0.99

A supplemental study was performed comparing the performance of the Access PTH assay in the Intraoperative mode on the DxI 9000 Access Immunoassay Analyzer to the Access 2 Immunoassay system. The results demonstrated that the performance of the device was not impacted by modifications to the device.

2. Matrix Comparison:
   Previously established in K061190.

C Clinical Studies:

1. Clinical Sensitivity:
   Not applicable.

2. Clinical Specificity:
   Not applicable.

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

D Clinical Cut-Off:
Not applicable.

E Expected Values/Reference Range:
Data establishing the reference range for the Access Intact PTH assay was previously reviewed in K061190.

VIII Proposed Labeling:
The labeling does support the finding of substantial equivalence for this device.

IX Conclusion:
The submitted information in this premarket notification is complete and does support a substantial equivalence decision.