Snibe Diagnostic

CE REF 130211001M: 100 tests
130611001M: 50 tests

MAGLUMI® Intact PTH (CLIA)

INTENDED USE

The kit is an *in vitro* chemiluminescence immunoassay for the quantitative determination of Intact Parathyroid hormone (Intact PTH) in human serum using the MAGLUMI series Fully-auto chemiluminescence immunoassay analyzer (including Maglumi 600, Maglumi 800, Maglumi 1000, Maglumi 1000 Plus, Maglumi 2000, Maglumi 2000 Plus, Maglumi 4000, Maglumi 4000 Plus, MAGLUMI X8, MAGLUMI X3 and MAGLUMI X6) and Biolumi series Integrated System (including Biolumi CX8).

SUMMARY AND EXPLANATION OF THE TEST

Parathyroid hormone (PTH), a prohormone secreted by the chief cells of the parathyroid glands as a polypeptide containing 84 amino acids, has a molecular mass of approximately 9500 Da[1]. PHT stored into dense neuroendocrine-type secretory granules to awaite secretion. After secretion PTH undergoes rapid proteolysis to generate various circulating C-terminal fragments, PTH half-life is approximately 4 minutes[2].

PTH acts to increase the concentration of ionic calcium (Ca^{2+}) in the serum, it regulates serum calcium through its effects on bone, kidney, and the intestine[3]. PTH reduces the reabsorption of phosphate from the proximal tubule of the kidney[4], which means more phosphate is excreted through the urine. PTH also increases the activity of 1-α-hydroxylase enzyme. Hyperparathyroidism, the presence of excessive amounts of parathyroid hormone in the blood, occurs in two very distinct sets of circumstances. Primary hyperparathyroidism is due to autonomous, abnormal hypersecretion of PTH from the parathyroid gland, while secondary hyperparathyroidism is an appropriately high PTH level seen as a physiological response to hypocalcaemia. A low level of PTH in the blood is known as hypoparathyroidism and is most commonly due to damage to or removal of parathyroid glands during thyroid surgery[5].

PTH assay may be used as an aid in the differential diagnosis of hypercalcemia, hypocalcemia and parathyroid disorders. PTH determination is important in monitoring dialysis patients to manage renal osteodystrophy[6-8].

PRINCIPLE OF THE TEST

The Intact PTH assay is a sandwich chemiluminescence immunoassay.

The sample (or calibrator/control, if applicable), ABEI labeled with anti-PTH monoclonal antibody, magnetic microbeads coated with another anti-PTH monoclonal antibody are mixed thoroughly and incubated, forming sandwich complexes, after precipitation in a magnetic field, decant the supernatant, then perform a wash cycle. Subsequently, the Starter 1+2 are added to initiate a flash chemiluminescent reaction. The light signal is measured by a photomultiplier as relative light units (RLUs), which is proportional to the concentration of PTH present in the sample (or calibrator/control, if applicable).

KIT COMPONENTS

Material Provided

Components	Contents	100 tests (REF: 130211001M)	50 tests (REF: 130611001M)
Magnetic Microbeads	Magnetic microbeads coated with anti-PTH monoclonal antibody, containing BSA, NaN_3 (<0.1%).	2.5 mL	2.0 mL
Calibrator Low	Containing BSA and Intact PTH antigen, NaN_3 (<0.1%).	3.0 mL	2.0 mL
Calibrator High	Containing BSA and Intact PTH antigen, NaN_3 (<0.1%).	3.0 mL	2.0 mL
ABEI Label	Anti-PTH monoclonal antibody labeled with ABEI, containing BSA, NaN_3 (<0.1%).	12.5 mL	7.5 mL
Internal Quality Control	Containing BSA and Intact PTH antigen, NaN_3 (<0.1%).	2.0 mL	2.0 mL
All reagents are provided ready-to-use.			

Accessories Required But Not Provided

MAGLUMI and Biolumi Series:

Reaction Module	REF: 630003
Starter 1+2	REF: 130299004M, 130299027M
Wash Concentrate	REF: 130299005M
Light Check	REF: 130299006M
Reaction Cup	REF: 130105000101

Please order accessories from Shenzhen New Industries Biomedical Engineering Co., Ltd. (SNIBE) or our authorized representatives.

CALIBRATION

Traceability: This method has been standardized against the WHO 1st International Standard 95/646.

Test of assay specific calibrators allows the RLU values to adjust the assigned master curve. Results are determined via a calibration curve which is instrument-specifically generated by 2-point calibration and a master curve (10 calibrations) provided via the reagent Radio Frequency Identification (RFID) CHIP.

Recalibration is recommended if any of the following conditions occurs:

- After each change of lots (Reagent or Starter 1+2).
- Every 2 weeks and/or each time a new reagent kit is used (recommended).
- After instrument service is required.
- If control results lie outside the expected range.

QUALITY CONTROL

Follow government regulations or accreditation requirements for quality control frequency.

Internal quality control is only applicable with MAGLUMI and Biolumi systems. For instructions for use and target value refer to ***Intact PTH (CLIA)***

Quality Control Information. User needs to judge results with their own standards and knowledge.
For detailed information about entering quality control values, refer to the corresponding Analyzer Operating Instructions.
To monitor system performance and chart trends, commercially available quality control materials are required. Treat all quality control samples the same as patient samples. A satisfactory level of performance is achieved when analyte values obtained are within the acceptable Control Range for the system or within your range, as determined by an appropriate internal laboratory quality control scheme. If the quality control results do not fall within the Expected Values or within the laboratory's established values, do not report results. Take the following actions:

- Verify that the materials are not expired.
- Verify that required maintenance was performed.
- Verify that the assay was performed according to the instructions for use.
- Rerun the assay with fresh quality control samples.
- If necessary, contact your local technical supporters or distributors for assistance.

SPECIMEN COLLECTION AND PREPARATION

- Use standard sampling tubes or tubes containing separating gel. Collect blood aseptically following the universal precautions for venipuncture. Because of the short half‑life of PTH, it is recommended that, the blood should be centrifuged immediately.
- Ensure that complete clot formation in serum specimens has taken place prior to centrifugation. Some specimens, especially those from patients receiving anticoagulant or thrombolytic therapy, may exhibit increased clotting time.
- If the specimen is centrifuged before a complete clotting, the presence of fibrin may cause erroneous results. Samples must be free of fibrin and other particulate matter.
- Do not use hemolyzed or grossly lipemic specimens as well as specimens containing particulate substance or exhibiting obvious microbial contamination. Inspect all specimens for bubbles, and remove bubbles before analysis for optimal results.
- Avoid repeating freeze-thaw cycles. The serum sample can be only frozen and thawed two times. Specimens must be mixed thoroughly after thawing.
- Centrifuged specimens with a lipid layer on the top must be transferred to a sample cup or a secondary tube. Care should be taken to transfer only the clarified specimen without the lipemic material.
- All samples (patient specimens and controls) should be tested within 3 hours when placed on board the MAGLUMI and Biolumi Systems. Refer to the SNIBE service for more details of onboard sample storage constraints.
- If testing will be delayed for more than 8 hours, remove serum from the serum separator, red blood cells or clot. Specimens removed from the separator, cells or clot may be stored up to 48 hours at 2-8°C.
- Specimens can be stored up to 6 months frozen at -20°C or colder. Stored samples should be thoroughly mixed prior to use (Vortex mixer).
- Before shipping specimens, it is recommended that specimens be removed from the serum separator, red blood cells or clot. When shipped, specimens should be packaged and labeled in compliance with applicable state, federal and international regulations covering the transport of clinical specimens and infectious substances. Specimens should be shipped frozen.
- The sample volume required for a single determination of Intact PTH is 100 µL.

WARNING AND PRECAUTIONS FOR USERS

- IVD
- For *In Vitro* Diagnostic Use.
- Follow the package insert carefully. Reliability of assay results cannot be guaranteed if there are any deviations from the instructions in this package insert.

Safety Precautions

- **CAUTION:** This product requires the handling of human specimens. It is recommended that all human sourced materials be considered potentially infectious and handled in accordance with the 29 CFR 1910.1030 Occupational exposure to bloodborne pathogens. Biosafety Level 2 or other appropriate biosafety practices should be used for materials that contain or are suspected of containing infectious agents.
- All samples, biological reagents and materials used in the assay should be considered potentially able to transmit infectious agents. They should therefore be disposed in accordance with the practices of your institution. Discard all materials in a safe and acceptable manner and in compliance with prevailing regulatory requirements.
- This product contains Sodium Azide. Dispose of contents and containers must be in accordance with all local, regional and national regulations.
- Refer to safety data sheets which are available on request.

Handling Precautions

- Do not use reagent kits beyond the expiration date.
- Do not interchange reagent components from different reagents or lots.
- Prior to loading the reagent kit on the system for the first time, the reagent kit requires mixing to re-suspend magnetic microbeads that have settled during shipment.
- For magnetic microbeads mixing instructions, refer to the Preparation of the Reagent section of this package insert.
- To avoid contamination, wear clean gloves when operating with a reagent kit and samples.
- Over time, residual liquids may dry on the septum surface. These are typically dried salts which have no effect on assay efficacy.
- For detailed discussion of handling precautions during system operation, refer to the SNIBE service information.

STORAGE AND STABILITY

- Sealed: Stored at 2-8°C until the expiration date.
- Opened at 2-8°C: Minimum stability is 4 weeks.
- On-board: Minimum stability is 4 weeks.
- To ensure the best kit performance, it is recommended to place opened kits in the refrigerator after the end of the intraday test work. It is still possible to keep on using the kit beyond the opened or on-board period if the controls are found within the expected ranges.
- Keep upright for storage to facilitate later proper resuspension of magnetic microbeads.
- Keep away from sunlight.

TEST PROCEDURE

Preparation of the Reagent

- Resuspension of the magnetic microbeads takes place automatically when the kit is loaded successfully, ensuring the magnetic microbeads are totally resuspended homogenous prior to use.
- To ensure proper test performance, strictly adhere to the corresponding Analyzer Operating Instructions. Each test parameter is identified via a

RFID CHIP on the Reagent kit. For further information please refer to the corresponding Analyzer Operating Instructions.

DILUTION

Sample dilution by analyzer is not available in this reagent kit.
Samples with concentrations above the measuring range can be diluted manually. After manual dilution, multiply the result by the dilution factor. Please choose applicable diluents or ask SNIBE for advice before manual dilution.

High-Dose Hook

No high-dose hook effect was seen for Intact PTH concentrations up to 10,000 pg/mL.

LIMITATIONS

- A skillful technique and strict adherence to the instructions are necessary to obtain reliable results.
- Bacterial contamination or heat inactivation of the specimens may affect the test results.
- A result within the expected range does not rule out the presence of disease and should be interpreted together with other diagnostic procedures.
- Test results are reported quantitatively. However, diagnosis of a disease should not be based on the result of a single test, but should be determined in conjunction with clinical findings in association with medical judgement.
- Any therapeutical decision should also be taken on a case-by-case basis.
- Patient samples containing human anti-mouse antibodies (HAMA) may give falsely elevated or decreased values. Although HAMA-neutralizing agents are added, extremely high HAMA serum concentrations may occasionally influence results.

RESULTS

Calculation of Results

The analyzer automatically calculates the Intact Parathyroid hormone (Intact PTH) concentration of each sample by means of a calibration curve which is generated by a 2-point calibration master curve procedure. The results are reported in the unit of pg/mL. For further information please refer to the corresponding Analyzer Operating Instructions.

Interpretation of Results

The expected range for the Intact PTH assay was obtained by testing 236 apparently healthy individuals in China, and gave the following expected value:
15-65 pg/mL (2.5^{th} and 97.5^{th} percentiles).
Results may differ between laboratories due to variations in population and test method. It is recommended that each laboratory should establish its own expected ranges.

PERFORMANCE CHARACTERISTICS

Precision

Precision for the Intact PTH assay was determined as described in the CLSI EP5-A2. 2 human serum and 3 controls containing different concentration of analyte were assayed in duplicate at two independent runs per day for 20 testing days. The results are summarized in the following table:

Sample	Mean(pg/mL) (N=80)	Within-Run		Between-Run		Total	
		SD(pg/mL)	%CV	SD(pg/mL)	%CV	SD(pg/mL)	%CV
Serum Pool 1	80.635	4.239	5.26	2.743	3.40	5.049	6.26
Serum Pool 2	1986.287	73.255	3.69	33.651	1.69	84.480	4.25
Control 1	19.952	1.176	5.89	1.072	5.37	1.591	7.97
Control 2	199.530	9.530	4.78	3.461	1.73	10.139	5.08
Control 3	804.328	33.635	4.18	20.812	2.59	39.553	4.92

Limit of Blank (LoB)

The LoB for the Intact PTH assay is 1.0 pg/mL.

Limit of Detection (LoD)

The LoD for the Intact PTH assay is 1.5 pg/mL.

Measuring Range

1.0-5000 pg/mL (defined by the limit of blank and the maximum of the master curve). Values below the limit of blank are reported as <1.0 pg/mL. Values above the measuring range are reported as >5000 pg/mL.

Linearity

The assay is linear between 1.5 pg/mL and 5000 pg/mL based on a study performed with guidance from CLSI EP6-A. Nine equally distributed levels of samples were prepared by blending a serum sample containing PTH 5300 pg/mL with a serum sample depleted of PTH (0.0 pg/mL).The mean sample recovery ranged between 90% to 110%.

Method Comparison

A total of 100 samples in the range of 6.76 and 4766.30 pg/mL were tested by the Intact PTH assay (y) and a commercially available immunoassay (x). The data from the resulting linear regressions are summarized as: $y=0.981x+6.270$, $r^2=0.997$.

Analytical Specificity

No interference was found when added to the following potentially cross reactive analytes.

Compound	Concentration
ACTH	100 pg/mL
PCT	1000 pg/mL
Osteocalcin	80 ng/mL
PTH 1-34	3600 ng/mL
PTH 39-84	10 ng/mL

Endogenous Interference

Substances up to the following concentrations did not interfere with the assay:

- Bilirubin 20 mg/dL
- Hemoglobin 500 mg/dL
- Triglyceride 5000 mg/dL

REFERENCES

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SYMBOLS EXPLANATIONS

	Consult instructions for use		Manufacturer
2°C 8°C	Temperature limit (Store at 2-8 °C)		Use-by date
Σ	Contains sufficient for		Keep away from sunlight
	This way up	EC REP	Authorized representative in the European Community
IVD	*In vitro* diagnostic medical device	CONTENTS	Kit components
REF	Catalogue number	LOT	Batch code