MAGLUMI Calcitonin (CLIA)

REF 130211002M Σ 100

EC REP

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CE

FOR PROFESSIONAL USE ONLY
Store at 2-8°C

COMPLETELY READ THE INSTRUCTIONS BEFORE PROCEEDING

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SYMBOLS EXPLANATIONS

EC REP	Authorized Representative in Europe
	Manufacturer
	Attention. See Instructions For Use
CONT	Contents of kit
IVD	In vitro diagnostic medical device (In vitro diagnostic use)
LOT	Lot number
REF	Catalogue Code
	Expiry date (Use by…)
8°C 2°C	Temperature limitation (store at 2-8°C)
Σ	Number of tests
	Keep away from sunlight
	Keep upright

INTENDED USE

The kit has been designed for the quantitative determination of Calcitonin (CT) in human serum.
The method can be used for samples over the range of 0-20000pg/ml.
The test has to be performed on the MAGLUMI chemiluminescence immunoassay (CLIA) fully auto analyzer (Including MAGLUMI 1000, MAGLUMI 2000 and MAGLUMI 2000 Plus and new developed models).

SUMMARY AND EXPLANATION OF THE TEST

Calcitonin (CT) is a amino acid peptide hormone secreted by thyroidal C-cells. It is regulated by calcium levels and metabolized by the kidney and liver. It circulates in multiple forms with molecular weights ranging from 3500 to 60000 daltons. Levels tend to be higher in men and children than in women. It is elevated in cases of medullary thyroid carcinoma and C-cell hyperplasia and is used in the diagnosis of these conditions. Medullary thyroid carcinoma (MTC) is a tumor of the CT-producing C-cells of the thyroid gland. Although a rare tumor, it can occur in a familial pattern as part of MEN(Multiple Endocrine Neoplasia) type II syndrome. These tumors usually produce diagnostically elevated serum concentrations of CT. Therefore, the immunoassay for CT in serum can be used to diagnose the presence of MTC with an exceptional degree of accuracy and specificity. In a small percentage of patients, basal hormone levels are indistinguishable from normal. Many of these subjects represent the early stages of C-cell neoplasia or hyperplasia most amenable to surgical cure. To identify these patients with early disease, provocative tests for CT secretion have been developed that can identify MTC in a patient whose diagnosis could have been missed if basal CT determinations only had been performed.
The main biologic effect of calcitonin is to inhibit osteoclastic bone resorption. Within minutes of administration, CT causes the osteocalst to shrink in size and to decrease its bone-resorbing activity. This event is accompanied by the production of cyclic adenosine monophosphate(cAMP) and by increased cytosolic calcium in the osteoclast. In a situation whre bone turnover is high, CT will produce hypocalcemia and hypophosphatemia. Other effects of CT have been reported.It has been observed to act as an anti-inflammatory agent, to promote fracture and wound healing, to be uricosuric, to be antihypertensive, and to be antihypertensive, and to impair glucose tolerance. CT may regulate and be regulated by other calcitropic hormones, and there is some evidence to suggest that it exerts an autoregulatory effect.
CT inhibits bone resorption and is administered as a drug for this purpose in cases of osteoporosis, Paget's disease and hypercalcemia of malignancy. The metabolism is a complex process and CT disappears from plasma in a multiexponential manner that includes an early half-life measured in minutes.
The stimulatory effect of calcium and gastrin-related peptides on CT has led to the use of these agents as provocative tests for the secretion of CT. These procedures are widely used in patients suspected of having medullary thyroid carcinoma (MTC), especially when the basal concentration of the hormone is not diagnostically elevated. CT measurements can also be used to evaluate the effectiveness of therapy in patients with CT-producing tumors.

PRINCIPLE OF THE TEST

Sandwich immunoluminometric assay:
Use an anti-CT monoclonal antibody to label ABEI, and use another monoclonal antibody to label FITC. Sample, Calibrator, or Control, are mixed thoroughly with FITC Label and nano magnetic microbeads in a cuvette incubated at 37℃, then cycle washing for

1 time. Then add ABEI Label and incubated to form a sandwich, after sediment in a magnetic field, suck the supernatant then cycle washing for the 2nd time. Subsequently, Starter 1+2 substrates are added and a flash chemiluminescent reaction is initiated. The light signal is measured by a photomultiplier as RLU within 3 seconds and is proportional to the concentration of CT present in controls or samples.

CONT KIT COMPONENTS

Material Supplies

Reagent Integral for 100 determinations	
Nano magnetic microbeads: microbeads coated with sheep anti-FITC polyclonal antibody, TRIS buffer, 0.2%NaN_3.	2.5ml
Calibrator Low: bovine serum, 0.2%NaN_3.	3.0ml
Calibrator High: bovine serum, 0.2%NaN_3	3.0ml
FITC Label: anti-CT monoclonal antibody labeled FITC contains BSA, 0.2%NaN_3.	7.5ml
ABEI Label: anti-CT monoclonal antibody labeled ABEI, containing BSA, 0.2%NaN_3.	7.5ml
All reagents are provided ready-to-use.	

Reagent Vials in kit box	
Internal Quality Control: containing BSA, 0.2%NaN_3. (target value refer to Quality Control Information date sheet)	2.0ml

Accessories Required But Not Provided

MAGLUMI Reaction Module	REF: 630003
MAGLUMI Starter 1+2	REF: 130299004M
MAGLUMI Wash Concentrate	REF: 130299005M
MAGLUMI Light Check	REF: 130299006M

Preparation of the Reagent Integral

Before the sealing is removed, gentle and careful horizontal shaking of the Reagent Integral is essential (avoid foam formation!) Remove the sealing and turn the small wheel of the magnetic microbeads compartment to and fro, until the colour of the suspension has changed into brown. Place the Integral into the reagent area and let it stand there for 30 min. During this time, the magnetic microbeads are automatically agitated and completely resuspended.

Do not interchange integral component from different reagents or lots!

Storage and Stability

- Sealed: Stored at 2-8°C until the expiry date.
- Opened: Stable for 4 weeks. To ensure the best kit performance, it is recommended to place opened kits in the refrigerator if it's not going to be used on board during the next 12 hours.
-  Keep upright for storage.
-  Keep away from direct sunlight.

CALIBRATION AND TRACEABILITY

1) Traceability

To perform an accurate calibration, we have provided the test calibrators standardized against the SNIBE internal reference substance,

Calibrators in the Reagent Kit are from Sigma.

2) 2-Point Recalibration

Via the measurement of calibrators, the predefined master curve is adjusted (recalibrated) to a new, instrument-specific measurement level with each calibration.

3) Frequency of Recalibration

- After each exchange of lots (Reagent Integral or Starter Reagents).
- Every week and/or each time a new Integral is used (recommendation).
- After each servicing of the MAGLUMI Fully Auto analyzer.
- If controls are beyond the expected range.

SPECIMEN COLLECTION AND PREPARATION

Sample material: serum

Collect samples using standard procedures.

Store at 2-8°C: 24 hours, for longer storage periods: freeze to below - 20°C.

Avoid repeated freezing and thawing cycles, stored samples should be thoroughly mixed prior to use (Vortex mixer).

Please ask local representative of SNIBE for more details if you have any doubt.

Vacuum Tubes

(a) Blank tubes are recommended type for collecting samples.

(b) Please ask SNIBE for advice if special additive must be used in sample collecting.

Specimen Conditions

- Do not use specimens with the following conditions:
  (a) heat-inactivated specimens;
  (b) Cadaver specimens or body fluids other than human serum;
  (c) Obvious microbial contamination.
- Use caution when handling patient specimens to prevent cross contamination. Use of disposable pipettes or pipette tips is recommended.
- Inspect all samples for bubbles. Remove bubbles with an applicator stick prior to analysis. Use a new applicator stick for each sample to prevent cross contamination.
- Serum specimens should be free of fibrin, red blood cells or other particulate matter.
- 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 clot forms, the presence of fibrin may cause erroneous results.

Preparation for Analysis

- Patient specimens with a cloudy or turbid appearance must be centrifuged prior to testing. Following centrifugation, avoid the lipid layer (if present) when pipetting the specimen into a sample cup or secondary tube.
- Specimens must be mixed **thoroughly** after thawing by **low** speed vortexing or by gently inverting, and centrifuged prior to use to remove red blood cells or particulate matter to ensure consistency in the results. Multiple freeze-thaw cycles of specimens should be avoided.
- All samples (patient specimens or controls) should be tested within 3 hours of being placed on board the MAGLUMI System. Refer to the SNIBE service for a more detailed discussion of onboard sample storage constraints.

Storage

- If testing will be delayed for more than 8 hours, remove serum or plasma from the serum or plasma separator, red blood cells or clot. Specimens removed from the separator gel, cells or

clot may be stored up to 24 hours at 2-8°C.
- Specimens can be stored up to 30 days frozen at -20°C or colder.

Shipping

Before shipping specimens, it is recommended that specimens be removed from the serum or plasma separator, red blood cells or clot. When shipped, specimens must be packaged and labeled in compliance with applicable state, federal and international regulations covering the transport of clinical specimens and infectious substances. Specimens must be shipped frozen (dry ice). Do not exceed the storage time limitations identified in this section of the package insert.

WARNING AND PRECAUTIONS FOR USERS

IVD

- For use in *IN-VITRO* diagnostic procedures only.
- Package insert instructions must be carefully followed. 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.

- The calibrators in this kit are prepared from bovine serum products. However, because no test method can offer complete assurance that HIV, Hepatitis B Virus or other infectious agents are absent; these reagents should be considered a potential biohazard and handled with the same precautions as applied to any serum or plasma specimen.
- All samples, biological reagents and materials used in the assay must be considered potentially able to transmit infectious agents. They should therefore be disposed of in accordance with the prevailing regulations and guidelines of the agencies holding jurisdiction over the laboratory, and the regulations of each country. Disposable materials must be incinerated; liquid waste must be decontaminated with sodium hypochlorite at a final concentration of 5% for at least half an hour. Any materials to be reused must be autoclaved using an overkill approach (USP 24, 2000, p.2143). A minimum of one hour at 121°C is usually considered adequate, though the users must check the effectiveness of their decontamination cycle by initially validating it and routinely using biological indicators.
- It is recommended that all human sourced materials be considered potentially infectious and handled in accordance with the OSHA Standard on Bloodborne Pathogens13. Biosafety Level 214 or other appropriate biosafety practices should be used for materials that contain or are suspected of containing infectious agents.
- This product contains Sodium Azide; this material and its container must be disposed of in a safe way.
- Safety data sheets are available on request.

Handling Precautions

- Do not use reagent kits beyond the expiration date.
- Do not mix reagents from different reagent kits.
- Prior to loading the Reagent Kit on the system for the first time, the microbeads requires mixing to re-suspend microbeads that have settled during shipment.
- For microbeads mixing instructions, refer to the KIT COMPONENTS, Preparation of the Reagent Integral section of this package insert.
- To avoid contamination, wear clean gloves when operating with a reagent kit and sample.
- Over time, residual liquids may dry on the kit surface, please pay attention the silicon film still exists on the surface of the kit.
- For a detailed discussion of handling precautions during system operation, refer to the SNIBE service information.

TEST PROCEDURE

To ensure proper test performance, strictly adhere to the operating instructions of the MAGLUMI Fully Auto analyzer. Each test parameter is identified via a RFID tag on the Reagent Integral. For further information please refer to the MAGLUMI Chemiluminescence Analyzer Operating Instructions.

100µl +50µl +50µl +20µl	Sample, calibrator or controls ABEI label FITC label Nano magnetic microbeads
15min	Incubation
400µl	Cycle washing
3 s	Measurement

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 is processed.

QUALITY CONTROL

- Observe quality control guidelines for medical laboratories
- Use suitable controls for in-house quality control. Controls should be run at least once every 24 hours when the test is in use, once per reagent kit and after every calibration. The control intervals should be adapted to each laboratory's individual requirements. Values obtained should fall within the defined ranges. Each laboratory should establish guidelines for corrective measures to be taken if values fall outside the range.

LIMITATIONS OF THE PROCEDURE

1) Limitations

Patients with malignancies may exhibit CT values within the normal range. CT concentrations may be elevated in case of liver cirrhosis, hepatitis or tyrosinaemia. Thus, CT determination is more suitable for therapeutic monitoring and follow-up as well as for a comparison with histological results. CT serum levels may only be interperted in context with the clinical picture and other diagnostic procedures. The CT assay should not be used as the only criterion for cancer screening.

2) Interfering Substances

No interference with test results is seen by concentrations of bilirubin<0.06mg/ml, haemoglobin<16mg/dl or triglycerides< 12.5mg/ml.

3) HAMA

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.

4) High-Dose Hook

High dose hook is a phenomenon whereby very high level specimens may read within the dynamic range of the assay. For the MAGLUMI CT assay, no high dose hook effect was observed when samples containing up to 50,000 pg/ml.

RESULTS

1) Calculation of Results

- The analyzer automatically calculates the CT concentration in each sample by means of a calibration curve which is generated by a 2-point calibration master curve procedure.

The results are expressed in pg/ml. For further information please refer to the MAGLUMI Chemiluminescence Analyzer Operating Instructions.

2) Interpretation of Results

Reference values：< 50 pg/ml.

Results may differ between laboratories due to variations in population and test method. Each laboratory should establish its own reference range.

PERFORMANCE CHARACTERISTICS

1) Precision

Intra-assay coefficient of variation was evaluated on 3 different levels of control serum repeatedly measured 20 times in the same run, calculating the coefficient of variation.

Intra-assay precision			
Control	Mean(pg/ml)	SD(pg/ml)	CV%
Level 1	78.3	4.15	5.31
Level 2	219.3	12.57	5.73
Level 3	630.2	31.64	5.02

Inter-assay coefficient of variation was evaluated on three batches of kits. Repeatedly measured 3 different levels of control serum 21 times, calculating the coefficient of variation.

Inter-assay precision			
Control	Mean(pg/ml)	SD(pg/ml)	CV%
Level 1	75.8	6.29	8.31
Level 2	210.7	18.42	8.74
Level 3	627.9	52.87	8.42

2) Analytical Sensitivity

The sensitivity is defined as the concentration of CT equivalent to the mean RLU of 20 replicates of the zero standard plus two standard deviations corresponding to the concentration from the standard curve. The sensitivity is typically less than 10.0 pg/ml.

3) Specificity

The specificity of the CT assay system was assessed by measuring the apparent response of the assay to various potentially cross reactive analytes.

Compound	Concentration	Cross reactivity
PCT	100 ng/ml	0.8%
PTH	1000 ng/ml	0.6%

4) Recovery

Consider calibrator high of known concentration as a sample, dilute it by 1:2 ratio with diluents, and measure its diluted concentration for 10 times. Then calculate the recovery of measured concentration and expected concentration. The recovery should be within 90% -110%.

Expected	Mean Measuring	Recovery
5156.7 pg/ml	5259.834 pg/ml	102%

5) Linearity

Use CT calibrator to prepare the six-point standard curve, measuring all points' RLU except point A, and then do four-parameter linear fitting in double logarithm coordinate, the absolute linear correlation coefficient(r) should be bigger than 0.9800.

Calibrator Point	Concentration pg/ml	Absolute linear correlation coefficient (r)
A	0	
B	100	r=0.9852
C	1500	
D	4000	
E	8000	
F	20000	

6) Method comparison

A comparison of MAGLUMI Calcitonin (y) with a commercially available Calcitonin test (x) using clinical samples gave the following correlations (pg/ml):

Linear regression
y = 0.98x+64.0
r = 0.972
Sy.x = 18.2

Number of samples measured: 200
The sample concentrations were between 45 and 17300 pg/ml.

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