MAGLUMI HBsAg (CLIA)

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FOR PROFESSIONAL USE ONLY
Store at 2-8°C

CAUTION: COMPLETELY READ THE INSTRUCTIONS BEFORE PROCEEDING

SYMBOLS EXPLANATIONS

	MANUFACTURER
	CONSULT INSTRUCTIONS FOR USE
CONTENTS	KIT COMPONENTS
IVD	IN VITRO DIAGNOSTIC MEDICAL DEVICE
LOT	BATCH CODE
REF	CATALOGUE NUMBER
	USE BY
8 °C 2 °C	TEMPERATURE LIMITATION (STORE AT 2-8 °C)
Σ	SUFFICIENT FOR
	KEEP AWAY FROM SUNLIGHT
	THIS WAY UP

INTENDED USE

The kit has been designed for the qualitative determination of Hepatitis B surface antigen (HBsAg) in human serum.
The test has to be performed on MAGLUMI Fully-auto chemiluminescence immunoassay (CLIA) analyzer (Including Maglumi 600, Maglumi 800, Maglumi 1000, Maglumi 1000 Plus, Maglumi 2000, Maglumi 2000 Plus, Maglumi 4000 and Maglumi 4000 Plus).

Catalog Number	Specification
130210001M	100 tests
130610001M	50 tests

SUMMARY AND EXPLANATION OF THE TEST

HBV is transmitted through infected body fluids, including blood, semen, and vaginal fluids (including menstrual blood). It also can be transmitted from a pregnant woman to her child at or near the time of delivery.
Hepatitis B surface antigen (HBsAg) is one of the most frequently performed tests for HBV. This HBV antigen is the earliest indicator of an active hepatitis B infection. This antigen may be present before symptoms of an HBV infection are present. If this antigen level remains high for more than 6 months, then people will probably become a carrier of HBV, meaning people can transmit it to others throughout people 's life.
Hepatitis B surface antibody (HBsAb) is also one of the most common tests for HBV. Usually this antibody appears about 4 weeks after HBsAg disappears and means that the infection is at the end of its active stage and people cannot pass the virus to others (people is no longer contagious). This antibody also protects people from getting HBV again in the future. The test is done to determine the need for vaccination; the antibody will be present after receiving the HBV vaccine series, showing that people has protection (immunity) from the virus. Occasionally the test may show that people have both HBsAb antibodies and HbsAg antigen antibodies; in this case, people is still contagious.
Hepatitis B core antibody (HBcAb) is an antibody to the hepatitis B core antigen. This antibody appears about 1 month after an active HBV infection. It can be found in people who had an infection in the past and in those with long-term (chronic) HBV. It usually is present for life.
Hepatitis B e-antigen (HbeAg) is an HBV protein that is only present during an active HBV infection. This test determines how contagious people is. Testing for this antigen can also be used to monitor the effectiveness of treatment for HBV. Hepatitis B e-antibody (HBeAb) shows that the active stage of the HBV infection is almost over and the risk of being contagious is greatly reduced. HBeAb is usually present during chronic HBV infections.

PRINCIPLE OF THE TEST

Sandwich chemiluminescence immunoassay;
Use ABEI to label an anti-HBs polyclonal antibody, use another monoclonal antibody to coat magnetic microbeads. The sample, (or calibrator/control, if applicable), buffer and magnetic microbeads are mixed thoroughly and incubated at 37°C, after precipitation in a magnetic field, decant the supernatant, and perform a wash cycle. Then add ABEI Label, incubate to form sandwich complexes, then perform another wash cycle. Subsequently, the Starter 1+2 are added to initiate a flash chemiluminescent reaction. The light signal is measured by a photomultiplier within 3 seconds as RLU, which is proportional to the concentration of HBsAg present in samples.

CONTENTS KIT COMPONENTS

Material Supplies

Component	100 tests	50 tests
Magnetic Microbeads: TRIS buffer, 0.09%NaN_3, coated with anti-HBs monoclonal antibody.	2.5 mL	2.0 mL
Calibrator Low: phosphate buffer, containing BSA and Hepatitis B Surface (*E. coli*, Recombinant) Antigen, 0.09%NaN_3.	3.0 mL	2.0 mL
Calibrator High: phosphate buffer, containing BSA and Hepatitis B Surface (*E. coli*, Recombinant) Antigen, 0.09%NaN_3.	3.0 mL	2.0 mL
Buffer: Tris buffer, containing BSA, 0.09% NaN_3.	12.5 mL	7.5 mL
ABEI Label: anti-HBs polyclonal antibody labeled with ABEI, containing BSA, 0.09%NaN_3.	22.5 mL	12.5 mL
All reagents are provided ready-to-use.		

Reagent Vials in kit box	
Internal Quality Control: phosphate buffer, containing BSA and Hepatitis B Surface (*E. coli*, Recombinant) Antigen, 0.09%NaN_3. (For target value, refer to Quality Control Information data sheet)	2.0 mL

Internal quality control is only applicable with MAGLUMI system. For instructions for use and target value, refer to Quality Control Information data sheet. User needs to judge results with their own standards and knowledge.

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

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

Preparation of the Reagent Integral

Mix contents of new (unopened) reagent packs by gently inverting pack several times. Resuspension of the microbeads takes place automatically prior to use. Visually verify that the microbeads are completely resuspended in brown color. In case microbeads are not resuspended, it is recommended to perform a gentle horizontal motion until the microbeads are completely resuspended.

Do not interchange integral components from different reagents or lots!

Storage and Stability

- Sealed: Stored at 2-8°C until the expiration date.
- On-board: Minimum stability is 4 weeks. After this period, it is still possible to keep on using the Reagent Integral provided that the controls are found within the expected ranges.
- 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.

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CALIBRATION AND TRACEABILITY

1)Traceability

To perform an accurate calibration, we have provided the test calibrators standardized against the WHO 1st International Standard Panel 03/262.

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 (recommended).
- After each servicing of MAGLUMI Fully-auto chemiluminescence immunoassay (CLIA) analyzer.
- If controls are beyond the expected range.
- Whenever room temperature changes exceed 5°C (recommended).

SPECIMEN COLLECTION AND PREPARATION

Sample material: serum

Collect 5.0mL venous blood into Blood Collection Tube. Separate serum by centrifugation after standing whole blood at room temperature.

Avoid repeated freezing and thawing. The serum sample can be frozen and thawed for only two times. 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.

Specimen Conditions

- Do not use specimens with the following conditions:
  (a) heat-inactivated specimens;
  (b) Cadaver specimens;
  (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 clotting, 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.
- To ensure consistency in results, specimens must be transferred to a centrifuge tube and centrifuged at ⩾1,000 RCF (Relative Centrifugal Force) for 15 minutes before testing

if they contain fibrin, red blood cells, or other particulate matter, or they were frozen and thawed.

Storage

- 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 gel, cells or clot may be stored up to 12 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 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).

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.

- 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. 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 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.
- 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 a reagent kit and sample.
- Pay attention to the residual liquids which has dried on the kit surface.
- For detailed 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 MAGLUMI Fully-auto chemiluminescence immunoassay (CLIA) analyzer. Each test parameter is identified via a RFID tag on the Reagent Integral. For further information please refer to MAGLUMI Fully-auto chemiluminescence immunoassay (CLIA) analyzer Operating Instructions.

100 µL +100 µL +20 µL	Sample, calibrator Buffer Magnetic Microbeads
20 min	Incubation
400 µL	Wash cycle
+200 µL	ABEI label
20 min	Incubation
400 µL	Wash cycle
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 must be 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 (a run cannot exceed 24 hours), 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

A skillful operation and strict adherence to the instructions are necessary to obtain reliable results.
Procedural directions must be followed exactly and careful operation must be used to obtain valid results. Any modification of the procedure is likely to alter the results.
Bacterial contamination or repeated freeze-thaw cycles may affect the test results.

2) Interfering Substances

The assay is unaffected by bilirubin<0.4 mg/mL, haemoglobin<10 mg/mL or triglycerides< 20mg/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.

RESULTS

1) Calculation of Results

- The analyzer automatically calculates the HBsAg 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 index/mL. For further information please refer to the the operating instructions of MAGLUMI Fully-auto chemiluminescence immunoassay (CLIA) analyzer.
- Conversion factor: 1 IU/mL = 10 index/mL

2) Interpretation of Results

Results obtained with the MAGLUMI HBsAg assay can be

interpreted as follows:

- Non-reactive: A result less than 1.0 index/mL (< 1.0index/mL) is considered to be negative.
- Reactive: A result greater than or equal to 1.0 index/mL is (≥ 1.0 index/mL) considered to be positive.

If Sample test result is out of assay range, sample can be dilute mannually, **PLEASE NOTE THAT ONLY HBsAb and HBsAg BOTH NEGATIVE HUMAN SERUM CAN BE USE AS DILUENT**, (Bovine Serum can not be use as diluent here). After manual dilution, multiply the test result with the dilute ration.

PERFORMANCE CHARACTERISTICS

1) Precision

Intra-assay coefficient of variation was evaluated on 3 different levels of controls. Repeatedly measure 10 times in the same run to calculate the coefficient of variation.

Intra-assay precision			
Control	Mean(index/mL)	SD(index/mL)	CV%
Level 1	6.07	0.21	3.46
Level 2	98.47	3.28	3.33
Level 3	432.16	13.22	3.06

Inter-assay coefficient of variation was evaluated on three batches of kits. Repeatedly measured 3 different levels of controls 10 times in the same run, and 30 times for each levels to calculate the coefficient of variation.

Inter-assay precision			
Control	Mean(index/mL)	SD(index/mL)	CV%
Level 1	6.287	0.25	3.98
Level 2	103.57	3.15	3.04
Level 3	457.81	15.20	3.32

2) Analytical Sensitivity

<1 index/mL.

The detection limit represents the lowest analyte level that can be distinguished from zero.

3) Specificity

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

No cross reaction with IgG or IgM antibody of HAV, HCV, HIV, syphilis, EBV. Non HBV infected sample which is RF or ANA positive, ,this reagent's determination results show negative. When HAV antigen, HCV core antigen, HCV NS3, HCV NS5 separately reachs a concentration of 100ng/mL, HBsAg detection show negative. When HBeAg =1124.683 index/mL, HBsAg detection <1 index/mL.

4) Recovery

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

Expected	Mean Measuring	Recovery
1581.140 index/mL	1563.755 index/mL	98.9%

5) Clinical Sensitivity

890 samples are from HBV infected patients with different stages of disease, The resulting sensitivity of confirmed positive samples is 100%. The data from the study are summarized in the following table..

Group	N	Reactive	Number of Confirmed Positive
Preselected HBsAg Positive	437	437	437
Acute HBV Infection	112	112	112
Chronic HBV Infection	241	241	241
Increased Risk for HBV Infection	100	8	8

6)Clinical specificity

In a group of randomly selected blood donors, hospitalized patients and potentially cross-reacting blood-specimens, the specificity of the MAGLUMI HBsAg assay was found to be 99.82% .

Group	N	Reactive	Non-reactive	Number of Confirmed Positive
Unselected donors	1400	7	1393	4
Hospitalized patients	200	3	197	3
Potentially cross-reacting blood-specimens	100	0	100	0
Total	1700	10	1690	7

7) HBsAg Mutant Detection

HBsAg mutant susceptibility was evaluated with the MAGLUMI HbsAg assay. The most prevalent HBsAg mutant, the Gly→Arg 145 mutant (Glycine [GLY] to Arginine [ARG] mutation at amino acid position 145 of HBsAg),was readily detected in the assay with a sensitivity equivalent to detection of wild type HBsAg.

8) Seroconversion sensitivity

Seroconversion sensitivity of the MAGLUMI HBsAg assay has been evaluated by testing 6 commercial seroconversion panels, which have been tested by commercially available CE-marked HBsAg assays.The MAGLUMI HBsAg Quant assay showed equivalent seroconversion sensitivity for 6 panels when compared to the results from other commercially available test.The data were listed in the table below:

1st Panel member from which Maglumi HBsAg assay detection of HBsAg seroconversion		
	CE-marked HBsAg assay	MAGLUMI HBsAg assay
Panel ID	reactive	reactive
Seracare PHM934	01	01
ZeptoMetrix HBV6271	04	03
ZeptoMetrix HBV6273	05	04
ZeptoMetrix HBV6274	02	02
ZeptoMetrix HBV6275	05	04

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