

NEPHSTAR®

Beta 2 Microglobulin (BMG) Kit

Catalog NO.

DK062

1. Intended Use

This product is used on NEPHSTAR® protein analysis system for quantitative determination of human Beta 2 Microglobulin (BMG) in serum as an aid in diagnosis of abnormal BMG metabolism.

2. Summary

Found on the membranes of virtually all body cells, BMG is a low molecular weight (11,800 Daltons) protein and a component of HLA class I light chain. Free BMG is a product of cell breakdown. It is secreted by the renal glomeruli, then absorbed and catabolized by the renal tubular cells. Decreased glomerular filtration is associated with high serum levels of BMG, whereas tubular insufficiency is associated with normal serum and high urine levels. Markedly increased cell breakdown, as in acute leukaemia, may also be associated with high serum levels.

3. Test Principle

Immunonephelometry is applied. This method involves measuring the light scattered by insoluble complexes formed by reaction between specific protein in samples and its respective antiserum. The amount of scattered light is directly proportional to the concentration of the protein on condition that antiserum is in excess. Concentrations are automatically calculated by reference to a calibration curve stored in the instrument.

4. Kit components

Code	Name	Volume/Quantity
DA062	BMG Antiserum	1 × 0.5ml
DB062	BMG Reaction Buffer	1 × 15mL
DC062	BMG Magnetic card	1
DM062	BMG Control	1 × 0.3mL
	Manual	1

5. Materials required but not supplied

5.1 NEPHSTAR Protein analysis system (NS100)

5.2 NEPHSTAR Accessory pack (DK110)

5.3 Electronic pipette (YB201)

5.4 Pipette 5-50uL (YB301)

5.5 Pipette 200-1000uL (YB302)

5.6 Equipment for collection of Samples

6. Storage and Stability

The unopened reagent kit should be stored under 2-8°C and can be used until the expiry date labeled on the kit. Do not freeze! The buffer should be equilibrated to room temperature (18-25°C) before use. Once opened store the antiserum and control at 2-8°C and the buffer at 18-25°C and be sure to screw on the cap tightly. Under these conditions the buffer is stable for 3 months, antiserum and control for 1 month.

7. Sample Collection And Preparation

Use serum or urine as samples. Collect blood samples by venepuncture and let them clot naturally and separate the sera as soon as possible to prevent haemolysis. Sera or urine may be stored at 2-8°C for 48 hours, otherwise freeze at -20°C or below; do not freeze and thaw more than once. Caution: morning urine is not recommended. We suggest first removing the morning urine and then drinking 500ml water, 60 minutes later the urine samples could be collected. If urine pH value is lower than 6.0, sodium hydroxide added to adjust it at a neutral pH range.

Simultaneous determinations of BMG level in both sera and urine are recommended to evaluate renal dysfunction.

Sample dilutions should be freshly prepared on the day of assay. Testing of the following types of sera may result in misleading values:

7.1 Highly lipemic, turbid and haemolysed samples are not suitable for nephelometric assays and should not be used unless centrifuged or prepared using other methods. If the background is too turbid and can not be removed, please think of other measuring method.

7.2 Testing of samples containing rheumatoid factors, paraproteins or circulating immunocomplexes can result in misleading values due to non-specific scattering light possibly generated by these articles.

8. Test Procedure

Summary: Reagent volumes added to the cuvette

Reagent	Volume
Sample (serum 1/40) (urine 1/11)	40ul
BMG Reaction Buffer	400ul
BMG Antiserum	20ul

8.1 Switch NEPHSTAR on.

8.2 Enter chemistry number. Enter chemistry number of BMG kit (BMG=62). If BMG assay has never been performed on the instrument before, please swipe card when "please swipe card" is displayed.

8.3 The assay name and lot of reagent are displayed. Check carefully; press ENTER if the lot number is identical to that printed on the card or kit label, otherwise swipe card to update the curve data stored in NEPHSTAR.

8.4 Dilute samples or controls using NEPHSTAR Sample Diluent supplied in NEPHSTAR Accessory pack (Cat. No: DK110). The default dilution scheme for BMG assay is 1/40 (e.g. 780uL sample diluent + 20uL sample); We recommend 1/11 for urine dilution (e.g. 400uL sample diluent + 40uL sample)

8.5 Prepare one cuvette for each sample to be assayed. Place a stirring bar to the cuvette using the forceps supplied with NEPHSTAR, and then add 40uL of diluted sample carefully to the bottom of the cuvette.

8.6 Enter sample ID. Press number keys to enter the sample ID; or press ENTER to accept the currently displayed sample ID.

8.7 Enter sample dilution: 40. Accept the default sample dilution by pressing ENTER; otherwise press number keys to alter the dilution scheme.

8.8 Place cuvette in chamber. Place the cuvette containing a stirring bar and 40uL of diluted sample in the chamber and press it down slightly until it reaches the bottom of the chamber. The cuvette will be detected automatically.

8.9 Add reagent. Add 400 uL BMG reaction buffer and 20 uL BMG antiserum simultaneously into the

cuvette using the electronic pipette (Cat. No.: YB201) supplied with NEPHSTAR. NEPHSTAR will sense the addition of reagents. With movement of the stirring bar, the assay begins after blanking and result will be printed automatically at the end of the assay.

- 8.10 On completion of the assay remove the cuvette, press ENTER to perform the next assay. Sample ID will increase sequentially. For alteration of the ID press BACK twice and tip in the right number.
- 8.11 If NEPHSTAR indicates result is higher than measurement range, reassay the sample at a higher dilution of e.g. 1/440 (400µL sample diluent + 40µL 1/40 diluted sample) . Accordingly the sample dilution should be altered to 1/440 (press BACK and then the number keys to alter the sample dilution); or 1/121 for urine dilution (400µL sample diluent + 40µL 1/11 diluted sample)
- 8.12 If NEPHSTAR indicates result is lower than measurement range, reassay the sample at a lower dilution of e.g. 1/11 (400µL sample diluent + 40µL sample) . Accordingly the sample dilution should be altered to 1/11 (press BACK and then the number keys to alter the sample dilution) ; or 1/5 for urine dilution (160µL sample diluent + 40µL sample)
- 8.13 On completion of all assays of the same chemistry press ESC and return to step 8.2. Enter new chemistry number and begin another assay.

9. Quality Control

In accord with good laboratory practice, users should run control with every batch of samples. Results of control should fall in the validity range labeled on the control vial.

10. Sensitivity and measuring range

The sensitivity limit is 0.50mg/L and the upper limit is 12mg/L when the default dilution scheme is applied. The sensitivity limit is 0.063mg/L when samples are diluted at 1/5.

11. Antigen Excess

Sample concentration of less than 70mg/L will not result in antigen excess, when the results will be misleadingly low. On suspicion of antigen excess please re-assay the sample at dilution of 1/440(400uL sample diluent +40uL 1/40 diluted sample).

12. Reference Range

12.1 Normal range of BMG concentration of healthy adult in sera is lower than 2.5mg/L or no more than 0.25mg/L in urine. We recommend local reference ranges are produced.

12.2 Diagnosis and treatment can not only depend on determination of BMG. The clinical symptoms and other laboratory findings of respective patients should be taken into consideration.

13. Precision

Two analyte concentrations are assayed within several days using this kit of the same lot on NEPHSTAR. 20 repeat assays are performed for each concentration. The average coefficient variations (CV) for each concentration are displayed in the following table:

BMG (g/L)	CV (%)
1.1	2.03
8.4	2.54

14. Correlation Study

A correlation study is performed on 20 clinical serum samples using this kit on NEPHSTAR and Behring reagent on BNII. The linear regression equation and correlation equation got as showed below demonstrate a good correlation between the two methods:

$$Y=0.996+0.056$$

$$(Y= \text{NEPHSTAR}^{\text{®}} \text{ BMG}, X=\text{BNA BMG})$$

Correlation coefficient $r = 0.979$

15. Caution And Warning

- 15.1 The reagents are only for in vitro diagnostic use.
- 15.2 The reagents can be used only by trained personnel and good laboratory practice (GLP) and the stated procedure should be abided strictly.
- 15.3 All sera have been tested to be HIV(1&2) antibody negative, HBsAg negative. However, the performed testing method can not assure the absolute absence of infectious agents in blood products, so please be sure to handle the blood products such as controls and antiserum as potentially infectious sources.
- 15.4 All reagents of the kit contain sodium azide as preservative. Take caution when handling them. Ingest or contact of the reagents with skin or mucous membranes is forbidden. Wash with large amount of water and seek medical advice if contact does occur. In addition, explosive metal azides may be formed with lead or copper plumbings; when disposing the reagents is sure to flush with large amount of water to avoid buildup of azide.
- 15.5 All components of kit are NEPHSTAR[®] specific. Reagents of different lots are not interchangeable; otherwise the results can be misleading.

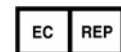
16. References

- 16.1 Bablok W et al. General Regression Procedure for Method Transformation. J Clin Chem Biochem 1988; 26:783-790
- 16.2 Naito, H.K., J. Clin. Immunoassay, 9, 155 (1986)



Goldsite Diagnostics Inc.

#3A & 4A, Technology Building Annex
Nanhai Road, Nanshan District
Shenzhen, P.R.China, 518067
Tel: 86 755 26890807
Fax: 86 755 26890799



Wellkang Ltd t/a Wellkang Tech Consulting

Suite B,29 Harley Street
LONDON W1G 9QR
England, United Kingdom



