Lifotronic

CE

Instruction For Use

【Product Name】

Creatine Kinase MB (Electrochemiluminescence Immunoassay)

【Order Information】

REF NO.	Package Size
691039	50T
691040	2×50T
691017	100T
691018	2×100T

【Intended Use】

Immunoassay for in vitro quantitative determination of creatine kinase MB in human serum and plasma. The results can be used in assisting diagnosis of myocardial injury.

Creatine kinase is a dimeric enzyme, consisting of M and B subunit. Creatine kinase in human body occurs in four different forms: creatine kinase MB (CK-MB), CK-BB (brain type), cytosolic isoenzymes CK-MM (muscle type) and mitochondrial isoenzymes (CK-MiMi). The proportion of CK-MM is very large, the proportion of CK-MB is less than 5% of total activity and the proportion of CK-BB is minimal in healthy human serum. CK-MB is expressed in the myocardium. The level of CK-MB in the peripheral blood will increase when CK-MB is released to the peripheral blood caused by the myocardial damage[1]. CK-MB is released when myocardial tissue is seriously damaged, so CK-MB has some limitations in the diagnosis of early stage of myocardial injury. The determination of CK-MB is often combined with MYO and cTnI which can improve the specificity and sensitivity in clinical diagnosis[2-3].

【Test Principle】

Sandwich principle. Total duration of assay: 18 minutes.

1st incubation: A sample, biotinylated monoclonal CK-MB-specific antibody and monoclonal CK-MB-specific antibody labeled by ruthenium trisbipyidyl NHS ester form a sandwich compound by immunoreaction.

2nd incubation: After addition of streptavidin-coated micro magnetic beads, the compounds bind to the micro beads via interaction of biotin and streptavidin.

Measurement: The reaction mixture is aspirated into the measuring cell where the micro beads and immuno-compounds are magnetically captured onto the surface of the electrode.

Unbound substances are then removed by Buffer. Application of a voltage to the electrode then induces emission of luminescence which is measured by a photomultiplier.

Results are determined via calibration and a master curve provided via the reagent barcode.

【Main Components】

The reagent pack consists of MB, RA, RB, calibrators. different lots cannot be used at the same time or mixed up together.

Components	Ingredients	Volume (50T)	Volume (2×50T)	Volume (100T)	Volume (2×100T)
(MB)	Streptavidin-coated micro magnetic beads, 0.75 mg/mL: 0.1M PBS; 0.05% ProClin™ 300	1×3.0mL	2×3.0 mL	1×5.0 mL	2×5.0 mL
(RB)	Anti-CK-MB-Ab~biotin, 2.5mg/L: 0.1M PBS; 0.05% ProClin™ 300	1×5.8mL	2×5.8 mL	1×9.0 mL	2×9.0 mL
(RA)	Anti-CK-MB-Ab~Ru(bpy)$_3^{2+}$, 1.2 mg/L: 0.1M PBS; 0.05% ProClin™ 300	1×5.8mL	2×5.8 mL	1×9.0 mL	2×9.0 mL
Calibrator (High)	Calf serum, 0.05% ProClin™ 300; lyophilized	1×1.0mL	2×1.0 mL	1×1.0 mL	1×1.0 mL
Calibrator (Low)	Calf serum, 0.05% ProClin™ 300; lyophilized	1×1.0mL	2×1.0 mL	1×1.0 mL	1×1.0 mL

The assignment of calibrators value complies strictly with ISO 17511:2020, and this method can be traced back to the Roche Elecsys CK-MB.

Supporting instruments and materials required but not provided in this pack (provided by Lifotronic)

Additional materials for Automated ECL Immunoassay Analyzer eCL8000, eCL8000i, eCL8000p, eCL8000x:

- Auffer, 480 mL, 6×480 mL
- Buffer, 480 mL, 6×480 mL
- Concentrated Washing Buffer
- Assay Cup

Additional materials for Automated ECL Immunoassay Analyzer eCL9000, eCL9000i, eCL9600, eCL9900, eCL9900i:

- Auffer, 2 L
- Buffer, 2 L
- Concentrated Washing Buffer
- Assay Cup, reaction cup
- Disposable Sampling Tips, pipette tips
- PreClean, system wash solution
- Waste Bags, litter bags

【Storage and Shelf Life】

Unopened reagent should be placed at 2~8ºC and will be valid for 12 months. Opened reagents should be stored at 2~8ºC in 28 days, otherwise trashed.

The calibrator are lyophilized and should be used as soon as possible after being dissolved. The dissolved calibrator can stable for 8 hours at 2~8ºC, 4 months at-25~-15ºC.

The expiration date is labeled on the box, rackpack and bottles.

Damaged, expired or contaminated reagents should be discarded.

【Applicable Instrument】

Automated ECL Immunoassay Analyzer: eCL8000, eCL8000i, eCL8000p, eCL8000x, eCL9000, eCL9000i, eCL9600, eCL9900, eCL9900i.

【Specimen collection, handling and storage】

Human serum and plasma added with heparin lithium, heparin sodium and EDTA-2K, EDTA-3K anti-coagulants are recommended. Blood samples should be collected by standard operation of venous puncture; after complete coagulation, the tangible component should be removed by centrifugation. The sample should avoid bubbling during testing. Lipid layer floating on the upper of the sample should be removed. Samples with severe hemolysis are not in suggestion. Samples would better to be tested in 4 hours after collection, otherwise, should be stored 2~8ºC for no more than 8 hours or -25~-15ºC, 90 days. Freezing and thawing cycle is permitted only once. The samples should be centrifugated before test if samples are deposited and frozen. Taking into account the possible factor of evaporation, the test of samples, calibrators and control materials is performed as short as possible within 2 hours.

【Assay Procedure】

Testing procedures and precautions

Previous to operation, one should read the operational manual carefully to obtain system operation procedure, sample processing, security precaution, maintenance and other related information.

Set up Creatine Kinase MB (CK-MB) test according to the operational manual.

Put the CK-MB rackpack into the correct analyzer slot to automatically suspend magnetic beads at least 30 min before testing.

The sample volume required for each CK-MB test is 15 µL.

Recommended ambient temperature:10~30°C; Relative humidity: ≤ 80%.

Calibration

Calibration should be performed using lot-matching reagent and calibrators.

Before calibration, the reagent and main curve information should be imported into the analyzer via radio frequency identification (RFID) reagent card (refer to instrument user manual). The analyzer adjusts the main curve to produce working curve according to the calibrator results, and identifies validity of the working curve automatically.

Recalibration is recommended when:

(1) When using a new lot of reagent;

(2) When the same lot of reagents has been used on the analyzer for more than 28 days;

(3)If the quality control result exceeds the defined limit;

(4)When changing the buffers of different lot numbers.

Add 1 mL de-ionized water accurately and put them vertically for 10~20 minutes at room temperature to dissolve the material in the bottle. Mix the calibrator thoroughly and avoid producing bubbles. Aliquoted calibrator need to be transferred rapidly to -25~-15ºC if not performed immediately.

Quality control

In order to ensure the reliability of test results, it's recommended to test the control materials every 24 hours. After each calibration, reagent lot change, maintenance or failure repair, quality control is recommended. The quality control results should fall within the scope of local regulations. If beyond, the analyzer status, reagents, calibration and other factors should be checked.

Handing of lyophilized calibrators :

Carefully dissolve the contents of one bottle by adding exactly 1.0 mL of distilled or deionized water and allow to stand closed for 10~15 minutes to reconstitute. Mix carefully, avoiding foam formation. Transfer aliquots of the reconstituted calibrators to the additional bottles. After bottles is marked and dispensed. If you do not test immediately, you need to store the aliquots immediately at -25~-15°C.

This kit do not contain control materials. It is recommended to use the Multi Control Cardiac Marker of Shenzhen Lifotronic Technology Co., Ltd.

Calculation

The system software automatically calculates the analyte concentration using

particular algorithm, and the result unit is ng/mL or μg/L : 1 ng/mL = 1 μg/L.

Specimen dilution

Samples exceeding the measuring range would be manually diluted with CK-MB-negative serum.

The recommended dilution ratio is 1:2, the concentration of the diluted sample must be > 50 ng/mL or μg/L, and the diluted sample test results need to multiply dilution ratio.

【Biological reference interval】

According to serum test results of 398 asymptomatic human (males 237, females 161) in Guangdong Province, P. R. China, the percentile 97.5 to 99 gives male reference range of 4.820~5.501 ng/mL and female reference range of 3.753~4.472 ng/mL.

Due to differences in the region, race, gender and age, laboratories are recommended to set up their own reference ranges.

【Result Interpretation】

For explaining the result, the patient's overall clinical manifestation should be referred to, including symptoms, medical history and other relevant data and information.

【Limitations】

Test results are used only for clinical reference and cannot be used as the basis for diagnosis or rule-out of diseases alone.

Even the concentration of CK-MB reached 10000 ng/mL, hook effect is unobservable.

When the sample containing bilirubin ≤ 400 μg/mL, lipid ≤ 30 mg/mL, total protein ≤ 100 mg/mL, biotin ≤ 30 ng/mL, or hemoglobin ≤ 5 mg/mL, or HAMA (human anti-murine antibodies) ≤ 320 ng/mL, interference deviation to the test result lies within ±10%. The test result would not be interfered by rheumatoid factor (3000 IU/mL).

【Measuring Range】

The measuring range of the kit is 0.3~280 ng/mL. For samples with CK-MB content below the lower detection limit, the results are reported in < 0.3 ng/mL; If the CK-MB content is above the upper detection limit, then the sample should be diluted and re-tested. The results are reported after multiplying with the dilution factor.

【Analytical Performance】

Lower limit of measurement

The lower detection limit is 0.3 ng/mL (repeatability study, n = 20).

Precision

Determination of CK-MB additive samples, the recovery rate should be within 90%~110%)

Linearity

The correlation coefficient (Pearson's r) is not less than 0.9900 in the interval of 0.3~280 ng/mL.

Within-run precision (repeatability)

The coefficient of variation (CV) is no more than 7.5%.

Between-lot precision

The coefficient of variation (CV) is no more than 10%.

Analytical specificity

Test results of blank samples spiked with analogs below are lower than 0.5 ng/mL.

Analog	Concentration (ng/mL)
CK-MM	10000
CK-BB	10000

【Method Comparison】

Measuring fresh clinical samples with Lifotronic and Roche CK-MB electrochemiluminescence immunoassay, respectively, two results gave linear correlation.

Regression equation: Y= 1.0437x +1.2009, Pearson's r = 0.975 (concentration range: 0.341～240.0 ng/mL).

【Precaution and Warning】

The kit is only used for in vitro diagnostics.

When using the kit, it's necessary to comply with regulations in the laboratory.

All reagents and samples including specimen, calibrators and control materials, should avoid foaming before and during test.

Test results of the kit are for clinical reference only, and clinical evaluation of patients should be combined with their symptoms and signs, medical history, other laboratory examination results and treatment responses.

Due to factors such as methodology or antibody specificity, testing identical samples with reagents from different manufacturers may get different results, and the results from different kits should not compare directly, lest cause the wrong medical explanation. It's suggested that laboratorians should point out the characteristics of used reagent in the test report to the clinician. In serial monitoring, if the reagent type is changed, a continuous parallel test should be performed and comparison of the results to the former to determine new baseline value.

This product contains animal-sourced materials and may have potential biological risk. All samples and test wastes should be treated as the source of infection, and all wastes must be disposed according to local regulations. The preservative ProClin™ 300 contains 3% 2-methyl-4-isothiazolin-3-one (MIT) and 5-chloro-2-methyl-4-isothiazolin-3-one (CMIT), will be harmful if inhalation, contact with skin and/or swallow, and may be toxic to aquatic organisms; thus, proper personal protection should be adopt while handling the reagent, and abandoned reagents should be dealed with in compliance with local regulations.

【Symbol】

Symbol	Title of Symbol	Symbol	Title of Symbol
	Manufacturer		Consult instructions for use
	Use by	IVD	In vitro diagnostic medical device
LOT	Lot number		Sufficient for <n> tests
SN	Serial number		Biological risks
	Temperature limitation		This way up
EC REP	Authorized representative in the European Community	CE	Indicates this device is in compliance with Europe Directive.
REF	Catalogue number	P/N	Material code

【Reference】

1. Panteghini M. Diagnostic application of CK-MB mass determination. Clinica Chimica Acta, 1998, 272(1): 23-31.
2. De Winter R J, Koster R W, Sturk A, et al. Value of myoglobin, troponin T, and CK-MB mass in ruling out an acute myocardial infarction in the emergency room. Circulation, 1995, 92(12): 3401-3407.
3. Kost G J, Kirk J D, Omand K. A strategy for the use of cardiac injury markers (troponin I and T, creatine kinase-MB mass and isoforms, and myoglobin) in the diagnosis of acute myocardial infarction. Archives of Pathology & Laboratory Medicine, 1998, 122(3): 245.

【Manufacturer】

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