

Human High-Sensitivity Cardiac Troponin T CLIA Kit

Chemiluminescence Immunoassay for the quantitative determination of Human High-Sensitivity Cardiac Troponin in human serum



INTENDED USE

The Human High-sensitivity Cardiac Troponin T CLIA Kit is a Chemiluminescence Immunoassay (CLIA) intended for the quantitative measurement of human High-sensitivity Cardiac Troponin T concentration in human serum.

For in-vitro diagnostics purposes only

SUMMARY OF PHYSIOLOGY

Cardiac troponin T is unique to cardiomyocytes. It is an early and highly specific marker after acute myocardial infarction. Cardiac troponin T is released about 3-4 hours after myocardial infarction and lasts for about 2 weeks. Troponin is the main regulatory protein of striated muscle excitation and contraction coupling. It consists of three subunits: troponin C, troponin T and troponin I. Troponin T is a protein of about 37KD with a high degree of organ specificity. Elevated serum levels indicate cardiomyocyte necrosis. Troponin T exists in the heart in free form (approximately 5%) and bound form (approximately 95%). When the myocardial cell membrane is intact, troponin T cannot leak out of the cell membrane. When the myocardial cell membrane is degenerated and necrotic due to ischemia and hypoxia, the free troponin T in cytoplasmic is released into the blood circulation and is detected. The release increased with the worsen of cardiomyocytes injured.¹

The immunoassay method is suitable for the in vitro quantitative determination of cardiac troponin T in human serum, plasma, and whole blood, and can be used as an auxiliary diagnosis of myocardial infarction.²

At present there are different methodologies to detect troponin T in clinical practice such as electrochemiluminescence method, colloidal gold method, and chemiluminescence immunoassay method.

ASSAY PRINCIPLE

The Human High-sensitivity Cardiac Troponin T CLIA Kit is designed, developed, and produced for the quantitative measurement of human High-sensitivity Cardiac Troponin T (hs-cTnT) level in serum samples. The assay utilizes a two-site "sandwich" technique with two antibodies that bind to different epitopes of hs-cTnT.

Assay calibrators, controls, or patient serum samples are added directly to a reaction vessel together with streptavidin coated magnetic particles and biotinylated hs-cTnT polyclonal antibody. The magnetic particles capture the biotin antibody as well as an immune-complex in the form of "magnetic particles–biotin hs-cTnT antibody–hs-cTnT–acridinium ester hs-cTnT antibody". Materials bound to the solid beads are held in a magnetic field while unbound materials are washed away. Then trigger solutions are added to the reaction vessel, and light emission is measured with the ECL100 analyzer. The relative light units (RLU) are *proportional* to the concentration of a hs-cTnT in the sample. The amount of analyte in the sample is determined from a stored, multi-point calibration curve and reported in serum hs-cTnT concentration.

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REAGENTS: PREPARATION AND STORAGE

This test kit must be stored at 2 – 8°C upon receipt. For the expiration date of the kit refer to the label on the kit box. All components are stable until this expiration date. It can be stored for 1 month at 2°C–8°C after kit opening.

1. hs-cTn T Magnetic Particle Solution (05001)

Qty: 3.5 mL (50/kit), 6.0mL (100/kit),
8.5mL (150/kit)

Storage: 2 – 8°C

Preparation: Ready to Use

2. Biotin hs-cTn T antibody (05002)

Qty: 3.5 mL (50/kit), 6.0mL (100/kit),
8.5mL (150/kit)

Storage: 2 – 8°C

Preparation: Ready to Use

3. Acridinium ester hs-cTn T antibody (05003)

Qty: 3.5 mL (50/kit), 6.0mL (100/kit),
8.5mL (150/kit)

Storage: 2 – 8°C

Preparation: Ready to Use

4. hs-cTn T Calibrators (05006-05007)

Qty: 2 x vials

Storage: 2 – 8°C

Preparation: Ready to Use

After the first use, it is recommended to storage at 2 - 8°C and can be used within one month. Do not freeze.

5. hs-cTn T Controls (05008-05009)

Qty: 2 x vials

Storage: 2 – 8°C

Preparation: Ready to Use

After the first use, it is recommended to storage at 2 - 8°C and can be used within one month. Do not freeze.

SAFETY PRECAUTIONS

The reagents must be used in a professional laboratory environment and are for in vitro diagnostic use. Source material which contains reagents of bovine serum albumin was derived in New Zealand. It was obtained only from healthy donor animals, maintained under veterinary supervision and found free of contagious diseases. Wear gloves while performing this assay and handle these reagents as if they were potentially infectious. Avoid contact with reagents containing hydrogen peroxide. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale fumes. On contact, flush with copious amounts of water for at least 15 minutes. Exercise Good Laboratory Practices.

MATERIALS REQUIRED BUT NOT PROVIDED

1. ECL100 Immunoassay Analyzer (ECL100) or ECL25 Immunoassay Analyzer (ECL25)
2. CL011 Cuvettes (for ECL100) or CL010 Cuvettes (for ECL25)
3. EDI™ Wash Reagent (P-594)
4. EDI™ Trigger Solutions A and B (P-595A, P-595B)

The instrument must operate using materials supplied by Epitope Biotechnology, Co.,Ltd. or Epitope Diagnostics, Inc. When materials sourced from third-party suppliers are being used, Epitope Biotechnology, Co.,Ltd. and Epitope Diagnostics, Inc. takes no responsibility for the validity of obtained results. Materials are available to purchase from Epitope Biotechnology, Co.,Ltd. and Epitope Diagnostics, Inc. Please contact your distributor for more information.

SPECIMEN COLLECTION AND PREPARATION

1. Blood sample should be collected under sterile conditions.
2. For human serum samples only; other body fluids and samples may not yield accurate results.
3. Clinical samples should be tested within 2 hours after collection. If the measurement cannot be completed within 2 hours, please store under the following conditions:
 - storage at low temperature and away from light (2°C~8°C) for 7 days,
 - storage at -20°C or below for 30 days
 - Freeze and thaw only once
4. Avoid heat-inactivated samples. Mixed, contaminated and hemolysis samples should be discarded.
5. Samples should be restored to room temperature before testing. Frozen samples should be completely melted and mixed well before use. Due to possible volatilization, samples, calibrators and controls on the ECL platform should be tested within 2 hours.
6. Some substances in the samples will interfere with the test results. The common interfering substances and maximum allowable concentrations are as follows:
 - bilirubin 25 mg/dL
 - triglycerides 1500 mg/dL
 - hemoglobin 100 mg/dL
7. A single assay of this item requires 50 µL sample. This quantity does not include the amount of dead volume in the sample container, the capacity required for retesting, and other measurement items. For the definition of minimum required sample size, refer to the equipment manual.

CALIBRATION

An active calibration curve is required for all tests. Calibration is required for the first time use of a reagent lot and every 28 days thereafter or when either kit control is out of range. Refer to appropriate system manuals for configuring calibrators.

QUALITY CONTROL

The characteristics of patient samples are simulated through controls and are critical to validate the performance of CLIA assays due to the random access format. Use of controls is left to the discretion of the user based on good laboratory practices, requirements, and applicable laws. Quality control results that do not fall within acceptable ranges may indicate invalid test results.

ASSAY PROCEDURE

1. Reagents from different kit lot numbers should not be combined or interchanged. Make sure that there are no air bubbles in any reagents, calibrator and control vials.
2. **Reagent Preparation**
 - 2.1 Remove reagent cartridges from packaging and replace the solid caps with the provided soft caps for ECL100. For ECL25, carefully remove the aluminum foil seal on each container on the cartridges.
 - 2.2 For the ECL100, take out the Magnetic Particle bottle make sure to roll between hands and gently but thoroughly mix until the magnetic particle solution is homogenous. The solution should be uniform with no clumps of magnetic particles visible; this step is vital for assay performance. For ECL25, mix the magnetic beads by moving back and forth the bottom part of the cartridge at upright position. Make sure to look inside the cartridge until the solution is uniform with no clumps of magnetic particles visible and no air bubbles. Recap the bottle. Open the top soft cap of all reagent bottles, leaving only the hollow soft rubber. The reagents are now ready to be loaded into the ECL100 or ECL 25 for calibration.
3. **Assay Program**
The following table illustrates the protocol used by the ECL100 or ECL25 for instrument operation.

Component	Quality Control Hole (µL)	Sample Hole (µL)
hs-cTn T Controls (05008-05009)	50	-
Samples	-	50
Biotin hs-cTn T antibody (05002)	50	50
Acridinium ester hs-cTn T antibody (05003)	50	50
hs-cTn T Magnetic Particle Solution (05001)	50	50
Incubate at 37°C for 5 minutes		
Wash the reaction cuvette 3 times with wash reagent.		
Trigger Solution A (P-595)	100-200	100-200
Trigger Solution B (P-595)	100-200	100-200

NOTE FOR ASSAY PROCEDURE

All the reagents in this kit are ready-to-use. Make sure that there is no air bubble in any reagents, calibrator and control vials. Reagents from different kit lot numbers must not be combined or interchanged.

Please read the reagent instructions and equipment instructions carefully before using this kit and perform the test according to relevant requirements. When reagents are loaded, the equipment will automatically stir the magnetic particles to resuspend them. Allow the reagent to mix for minimum 15 min before starting the assay program.

INTERPRETION OF RESULTS

1. The default unit for the hs-cTnT project is pg/mL (or ng/L).
2. Due to methodological differences or antibody specificity, there may be deviations between the test results of reagents from different manufacturers, so direct comparisons should not be made to avoid false interpretation.

- When the concentration of hs-cTnT in the sample exceeds 10000 pg/mL, dilute the sample (the maximum dilution is 10 times) with the sample diluent before testing.
- The concentration of hs-cTnT below the low detection limit is reported as <8.00 pg/mL, and the concentration above the upper detection limit is reported as >10000 pg/mL.

EXPECTED VALUES

Reference value for normal population is 14 pg/mL.

Note: each Laboratory is recommended to determine and establish its own reference range with local population.

LIMITATIONS OF THE PROCEDURE

- This product is for use on the ECL100 Immunoassay Analyzer or ECL 25 Immunoassay Analyzer only. Refer to the appropriate system manuals and/or Help system for a specific description of installation, start-up, operation, system performance, instructions, calibration, precautions, hazards, maintenance, and troubleshooting.
- Reagents from different kit lot numbers should not be combined or interchanged.
- Test results obtained from the proposed kit should not be served as a sole basis for clinical diagnosis or patient management.
- If the test sample result is higher than the upper limit of the calibration curve, it is recommended to re-measure after dilution according to a certain ratio. The measured value is recalculated according to the dilution ratio to ensure the accuracy of the result.

PERFORMANCE CHARACTERISTICS

- Hook Effect:**
 - The assay showed no hook effect up to 100000 pg/mL.
- Limit of Detection (LoD):**
 - 8.00 pg/mL
- Linearity:**
 - 8.0 pg/mL to 10000.0 pg/mL,
 - linearity correlation coefficient $R \geq 0.990$
- Accuracy:**
 - relative deviation within $\pm 10\%$
- Precision:**
 - Intra-assay repeatability: $CV \leq 8\%$
 - Inter-assay reproducibility: $CV \leq 15\%$

NOTES

- Read the instructions carefully and gently but thoroughly mix the reagent before use. Remove any air bubbles before loading the reagents onto the equipment.
- Keep the reagent in the storage conditions indicated in this IFU and on the reagent label. Do not freeze reagents.
- Avoid contact with skin, eyes and mucous membrane. Upon contact, flush the area with clean water immediately.
- All patient samples must be treated as potential infectious material.
- Components in different kits cannot be mixed.
- All waste must be disposed of in compliance with local regulations and laws

WARRANTY

This product is warranted to perform as described in its labeling and literature when used in accordance with all instructions. Epitope Biotechnology Co, Ltd and its distributors

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REFERENCE

- Guo Huijia, Zhang Jianyi, Hu Yajun, et al. Correlation of high-sensitive cardiac troponin T with chronic heart failure and its differential significance for acute myocardial infarction[J]. Chin. Gen. Pract., 2014, 33(8):871-874.
- Aviles RJ, Askari AT, Lindahl B, et al. Troponin T levels in patients with acute coronary syndromes, with or without renal dysfunction. N Engl J Med, 2002, 346: 2047-205.
- Zhang Guofeng, Guo Yue, Guan Haixia, et al. Information other than laboratory results should be valued when diagnosing thyroid diseases: Lessons from the misdiagnosis of Graves' hyperthyroidism in a woman taking biotin. Chin. J. Endocrinol. Metab., 1991, 68:1545-1550.

TECHNICAL ASSISTANCE AND CUSTOMER SERVICE

For technical assistance or to place an order, please contact Epitope Diagnostics, Inc. in USA at +1 858-693-7877 or email to cs@epitopediagnostics.com



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GLOSSARY OF SYMBOLS (EN 980/ISO 15223)



In Vitro
Diagnostic
Device



European
Conformity



Lot Number



Catalog Number



Read Instructions
before Use



Number of Tests



Store at



Use by



Keep Away from
Heat and Direct
Sun light



Manufacturer



Authorized
Representative in
Europe



Distributor