

Troponin I

Cardiac Troponin I (FIA)

REF: IN047701



25

Intended use

The Infinosis™ Troponin I (cTnI) is a fluorescence immunoassay (FIA) for the in vitro quantitative determination of cardiac troponin I (cTnI) in Human whole blood, serum or plasma. For professional use only.

Summary

References¹⁻⁴

Cardiac troponin I, often denoted as cTnI, is presented in cardiac muscle tissue by a single isoform with a molecular weight of 23.9 kDa. It consists of 209 amino acid residues. The theoretical pI of cTnI is 9.05. cTnI differs from other troponins due to its N-terminal extension of 26 amino acids. This extension contains two serines, residues 23 and 24, which are phosphorylated by protein kinase A in response to beta-adrenergic stimulation and important in increasing the inotropic response.

cTnI has been shown to be phosphorylated by protein kinase A, protein kinase C, protein kinase G, and p21-activated kinase 3. A significant part of cTnI released into the patient's blood stream is phosphorylated. For more than 15 years cTnI has been known as a reliable marker of cardiac muscle tissue injury. It is considered to be more sensitive and significantly more specific in diagnosis of the myocardial infarction than the "golden marker" of last decades – CK-MB, as well as total creatine kinase, myoglobin and lactate dehydrogenase isoenzymes.

Test principle

Sandwich principle. Total duration of assay: 15 minutes

Sample is added to the sample well of the test, then the fluorescence-labeled detector anti-cTnI antibody binds to cTnI antigen in blood specimen. As the sample mixture migrates to the nitrocellulose matrix of test strip by capillary action, the complexes of detector antibody and cTnI are captured to anti-cTnI antibody that has been immobilized on test strip.

The more cTnI antigen is in blood specimen, the more complexes are accumulated on test strip. Signal intensity of fluorescence of detector antibody reflects amount of cTnI captured and the instrument for infinosis™ tests shows cTnI concentrations in blood specimen.

Reagents

Materials provided

- **Test Cartridge**, 25 pcs, individually packaged
- **ID chip**, 1 pcs
- **Sample Buffer**, 25 tubes
- **IFU**, 1 copy

Materials required (but not provided)

- infinosis™ 2020 FIA analyzer
- Troponin I control (DiaSino control is recommended)
- Transfer pipette set (100 µL size)
- Centrifuge (for plasma and serum only)
- Timer

Precautions and warnings

- For in vitro diagnostic use only.
- Carefully follow the instructions and procedures described in this instructions before testing.
- The test cartridge should remain in its original sealed pouch until ready to use. Do not use it if the pouch is damaged or the seal is broken.
- Do not use reagents beyond the labeled expiry date.
- Do not mix or use components from kits with different Lots.
- Don't use Test Cartridge if its Lot does not match with ID Chip that is inserted onto the instrument.
- The infinosis™ Troponin I should be used only in conjunction with the instrument for infinosis™ tests.
- The tests should be applied by professionally trained staff working in certified laboratories at some remove from the patient and clinic at which the sample is taken by qualified medical personnel.
- infinosis™ Troponin I assay is single use only. Do not reuse it.
- The Test Cartridge and instrument for infinosis™ tests should be used away from vibration and magnetic field. During normal usage, the Test Cartridge may generate slight vibration, which should be regarded as normal.
- Use separate clean pipette tips and buffer tubes for different specimens. The pipette tips and detector buffer tubes should be used for one specimen only.
- Do not smoke, eat, or drink in areas in which specimens or kit reagents are handled.

- Blood specimens, used test cartridges, pipette tips and sample buffer tubes are potentially infectious. Proper laboratory safety techniques, handling and disposal methods should be followed in accordance with standard procedures and relevant regulations observed by microbiological hazard materials.
- The results should be interpreted by the physician along with clinical findings and other laboratory test results.

Incident report

Any suspected serious incidents related to this assay shall be immediately reported to DiaSino, DiaSino's Authorized Representative in the EU, and the national competent authorities of the Member States where the users and/or patients are located.

Storage and stability

- Store the test kit at 2-30°C, the stability is up to the expiration date printed on package.
- Test cartridge and sample buffer should be used within 1 hour after opening the pack.

Specimen collection and preparation

- The test can be performed with either whole blood, serum or plasma.
- Collect serum samples in accordance with correct medical practices.
- Using standard phlebotomy procedure, collect a venipuncture whole blood specimen using a blood collection tube. If collecting plasma use a blood collection tube containing suitable anticoagulant (EDTA recommended).
- Separate the serum/plasma from blood as soon as possible to avoid hemolysis.
- Test should be performed immediately after the specimens have been collected. Do not leave the specimens at room temperature for prolonged periods. Specimens may be stored at 2-8°C for up to 3 days. For long-term storage, specimens should be kept below -20°C.

Quality control

- Quality control tests are a part of the good testing practice to confirm the expected results and validity of the assay and should be performed at regular intervals.
- The control tests should be performed immediately after opening a new test lot to ensure the test performance is not altered.
- Quality control tests should also be performed whenever there is any question concerning the validity of the test results.
- Control materials are provided on demand with infinosis™ tests. For more information regarding obtaining the control materials, contact [DiaSino Laboratories Co., Ltd](#) for assistance.

Test setup

- Ensure that the lot number of the cartridge matches that of the sample buffer, and the ID Chip.
- If the sealed cartridge and sample buffer have been stored in refrigerator, place them at room temperature (18-25 °C) at least 30 minutes before measurement.
- Turn on the instrument for infinosis™ tests. Refer to the *'instrument for infinosis™ tests Operation Manual'* for the complete information and operating instructions.

Test procedure

1. Insert ID Chip into the instrument for infinosis™ tests and read ID chip information.
2. Using a pipette to transfer **100 µL** of sample (Human whole blood/plasma/serum) to the **sample buffer tube** provided in the kit.
3. Close the lid of the sample mixing tube and mix the sample thoroughly for **5-10 seconds** by tapping or inverting the tube.
4. Pipette out **100 µL** of **sample mixture** and load it onto the sample well on the cartridge.
5. Leave the sample-loaded cartridge at room temperature for **15 minutes**.
6. Insert the sample-loaded cartridge into the cartridge holder of instrument for infinosis™ tests. Ensure proper orientation of the cartridge before pushing it all the way inside the cartridge holder.
7. Press **"Test"** button on the instrument for infinosis™ tests.
8. Instrument for infinosis™ tests will start scanning the sample-loaded cartridge immediately.
9. Read the test result on the display screen of the instrument for infinosis™ tests.
10. Print out the testing results when press **"Print"** button on the instrument for infinosis™ tests.

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Limitations - interference

- This test has been developed for testing human whole blood, serum, plasma specimen only.
- The results of Infinosis™ Troponin I should be evaluated with all clinical and laboratory data available. If Troponin I test results do not agree with the clinical evaluation, additional tests should be performed.
- The false positive results may come from cross-reactions with some similar antibodies in blood, and similar epitopes from non-specific components in blood capturing fluorescent labeled antibodies.
- The false negative results may from some unknown substance blocking epitope adhering antibodies, unstable or degenerated Troponin I that cannot be identified due to prolonged time and temperature and storage condition of sample and reagent.
- Other factors may interfere with Infinosis™ Troponin I and may cause erroneous results. These include technical or procedural errors, as well as additional substances in blood specimens.
- For diagnostic purposes, the results should always be assessed in conjunction with the patient's medical history, clinical examination and other findings.

Measuring range

0.1-40 ng/mL (defined by the lower detection limit and the maximum of the master curve). Values below the lower detection limit are reported as < 0.1 ng/mL. Values above the measuring range are reported as > 40 ng/mL.

Lower detection limit

0.1 ng/mL

The detection limit represents the lowest analyte level that can be distinguished from zero. It is calculated as the value lying two standard deviations above that of the lowest standard (master calibrator, standard 1+2 SD, repeatability study, n = 21).

Expected value

0-0.3 ng/mL

Expected values may vary with age, sex, diet and geographical location. Each laboratory should determine its own expected values as dictated by good laboratory practice.

Specific performance data

Representative performance data are given below. Results obtained in individual laboratories may differ.

Precision

Intra-assay

Determined by using 10 replicates from same batch to test with 0.3 ng/mL Troponin I control. CV ≤ 10%.

Inter-assay

Determined by using 3 replicates from random 3 continuous batches to test with 0.3 ng/mL Troponin I control CV ≤ 15%.

Linearity

A serial concentration of Troponin I controls at 0.1 ng/mL, 0.5 ng/mL and 1.5 ng/mL, 5.0 ng/mL, 15 ng/mL, 25 ng/mL were each tested for three times, the Correlation Coefficient is $r \geq 0.9942$.

Method comparison

A comparison of the infinosis™ Troponin I assay (y) with the Roche Troponin I STAT assay (x) using 119 clinical samples gave the correlation: $r=0.9720$

Functional sensitivity

0.15 ng/mL

The functional sensitivity is the lowest analyte concentration that can be reproducibly measured with an intermediate precision CV of ≤ 20 %

References

- 11.Kozlowski, LP (21 October 2016). "IPC - Isoelectric Point Calculator". *Biology Direct*. 11 (1): 55. doi:10.1186/s13062-016-0159-9. PMC 5075173. PMID 27769290.
- 12.Solaro RJ, Moir AJ, Perry SV (1976). "Phosphorylation of troponin I and the inotropic effect of adrenaline in the perfused rabbit heart". *Nature*. 262 (5569): 615–616. doi:10.1038/262615a0. PMID 958429.
13. Layland J, Solaro RJ, Shah AM (2005). "Regulation of cardiac contractile function by troponin I phosphorylation". *Cardiovascular Research*. 66 (1): 12–21. doi:10.1016/j.cardiores.2004.12.022. PMID 15769444.

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14.Labugger R, Organ L, Collier C, Atar D, Van Eyk JE (2000). "Extensive troponin I and T modification detected in serum from patients with acute myocardial infarction". *Circulation*. 102 (11): 1221–1226. doi:10.1161/01.cir.102.11.1221. PMID 10982534.

Symbols



In vitro diagnostic
medical device



Temperature
limit



Consult
instructions for use



Catalog number



Batch code



Date of
manufacture



Use-by date



Contains sufficient
for <n> tests



Manufacturer



Do not re-use



Do not use if package is damaged
and consult instructions for use



European
Conformity



Authorized representative in
the European Community



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