Infection

ichroma™ Anti-HCV

INTENDED USE

ichroma™ Anti-HCV is a fluorescence Immunoassay (FIA) for the qualitative determination of antibody to Hepatitis surface antigen (Anti-HCV) in human whole blood/serum/plasma. It is useful as an aid to diagnosis of Hepatitis C virus infection.

For *in vitro* diagnostic use only.

INTRODUCTION

Hepatitis C virus (HCV) infection is a worldwide public health problem with a global prevalence of 2-3%. It is believed that about 170 million people are currently infected (about 3% of the world's population), and a further 3-4 million are infected each year. HCV is a frequent cause of chronic liver diseases such as hepatitis. HCV is the main reason for liver transplantation in the developed world and, it is primarily transmitted via blood.[1)2)] After 1-3 weeks of acute HCV infection, HCV RNA becomes detectable in blood and rapidly increases. Most infection is asymptomatic (70-80%) but symptoms including flu-like symptoms, fatigue, vomiting, nausea, right upper quadrant pain, muscle pain, or pruritus may develop within 2-12 weeks. About 50-80% of HCV infected patients progress to chronic infection. Once it becomes chronic hepatitis, it can cause persistent liver injury without spontaneous recovery leading to cirrhosis and HCC. Most (60-80%) patients with chronic hepatitis show no symptoms, but some can experience abdominal discomfort, fatigue, nausea, muscle pain, arthritis, or weight loss. Serologic assays testing are needed to confirm HCV infection. Physical examination, treatment and history taking should be done to understand the routes of transmission and block further reinfection. Detection of anti-HCV in serum or plasma is used for screening of a high risk group and for diagnosis of acute or chronic hepatitis C.[3)]

PRINCIPLE

The test uses a sandwich immunodetection method; the detector antibodies in buffer bind to antigen in the sample, forming antigen-antibody complexes, and migrate onto nitrocellulose matrix to be captured by the other immobilized-antibodies on test strip.

More antibodies in the sample will form more antigen-antibody complexes which lead to stronger fluorescence signal by detector antibodies, which is processed by instrument for ichroma tests to display the 'Positive' / 'Negative' / 'Indeterminate' in the sample.

COMPONENTS

ichroma™ Anti-HCV consists of 'cartridges', 'detector tube' and 'detector diluent'.

- The cartridge contains the membrane called a test strip which has recombinant HCV antigen at the test line and chicken IgY at the control line. All cartridges are individually sealed in an aluminum foil pouch containing a desiccant in a box.
- The detector tube has a granule containing HCV antigen-fluorescence conjugate, anti-chicken IgY-fluorescence conjugate and bovine serum albumin (BSA) as a stabilizer in phosphate buffered saline (PBS). All detector tubes are packed in a pouch.
- The detector diluent contains sodium chloride and bovine serum albumin (BSA) as a stabilizer and sodium azide as a preservative in phosphate buffered saline (PBS) and it is pre-dispensed in a vial. The detector diluent is packed in a box.

WARNINGS AND PRECAUTIONS

- For *in vitro* diagnostic use only.
- Follow instructions and procedures described in this 'Instruction for use'.
- Use only fresh samples and avoid direct sunlight.
- Lot numbers of all the test components (cartridge, detector tube, detector diluent and ID chip) must match each other.
- Do not interchange the test components between different lots or use the test components after the expiration date, either of which might yield incorrect test result(s).
- Do not reuse cartridges or detector tubes. A cartridge should be used for testing one sample only. A detector tube should be used for processing of one sample only.
- The cartridge should remain sealed in its original pouch until just before use. Do not use the cartridge, if pouch is damaged or has already been opened.
- Frozen sample should be thawed only once. For shipping, samples must be packed in accordance with the local regulations. Sample with severe hemolytic and/or hyperlipidemia must not be used.
- Allow cartridge, detector tube, detector diluent and sample to be at room temperature for approximately 30 minutes before use.
- The instrument for ichroma™ tests may generate slight vibration during use.
- Used cartridges, detector tubes, detector diluent and pipette tips should be handled carefully and discarded by an appropriate method in accordance with relevant local regulations.
- An exposure to larger quantities of sodium azide may cause certain health issues like convulsions, low blood pressure and heart rate, loss of consciousness, lung injury and respiratory failure.
- **ichroma™ Anti-HCV** will provide accurate and reliable results subject to the following conditions.
  - **ichroma™ Anti-HCV** should be used only in conjunction with instrument for ichroma™ tests.
  - Have to use recommended anticoagulant sample.

Recommended anticoagulant
K_2 EDTA, K_3 EDTA, EDTA, Na-heparin, Li-heparin Sodium Citrate

STORAGE AND STABILITY

Component	Storage condition		
	Storage Temperature	Shelf life	Note
Cartridge	4- 30 °C	20 months	Disposable
Detector tube	2-8 °C	20 months	Disposable
Detector diluent	2-8°C	20 months	Unopened

- After the cartridge pouch is opened, the test should be performed immediately.

LIMITATION OF THE TEST SYSTEM

- The test may yield false positive result(s) due to the cross-reactions and/or non-specific adhesion of certain sample components to the capture/detector antigens.
- The test may yield false negative result. The non-responsiveness of the antibodies to the antigens which is the most common if the epitope is masked by some unknown components, so therefore not being detected or captured by the antibodies. The instability or degradation of the antigen with time and/or temperature may also cause false negative results as it makes antigen unrecognizable by the antigens.
- Other factors may interfere with the test and cause erroneous results, such as technical/procedural errors, degradation of the test components/reagents or presence of interfering substances in the test samples.
- Any clinical diagnosis based on the test result must be supported by a comprehensive judgment of the concerned physician including clinical symptoms and other relevant test results.

MATERIALS SUPPLIED

REF CFPC-31

Components of **ichroma™ Anti-HCV**

- Cartridge Box:
  - Cartridge 25
  - Detector tube 25
  - Detector diluent 1
  - ID Chip 1
  - Instruction for Use 1

MATERIALS REQUIRED BUT SUPPLIED ON DEMAND

Following items can be purchased separately from **ichroma™ Anti-HCV**.

Please contact our sales division for more information.

- **Instrument for ichroma™ tests**
  - **ichroma™ II** REF FPRR021
- **Printer** REF FPRR007
- **Boditech Anti-HCV Control** REF CFPO-143

SAMPLE COLLECTION AND PROCESSING

The sample type for **ichroma™ Anti-HCV** is human whole blood/serum/plasma.

- It is recommended to test the sample within 24 hours after collection.
- The serum or plasma should be separated from the clot by centrifugation within 3 hours after the collection of whole blood.
- Samples may be stored for up to a week at 2-8 °C prior to being tested. If testing will be delayed more than a week, samples should be frozen at -20 °C.
- Samples stored frozen at -20 °C for 2 months showed no performance difference.
- However, the whole blood sample should not be kept in a freezer in any case.
- Once the sample was frozen, it should be thawed one time and only for test, because repeated freezing and thawing can result in the changed test values.

TEST SETUP

- **ichroma™ Anti-HCV** should be performed at environment temperature 25 ± 3 ℃.
- Check the contents of **ichroma™ Anti-HCV**: Sealed Cartridges, Detector tubes, Detect diluents, ID Chip and Instruction for use.
- Ensure that the lot number of the cartridge matches that of the detector tubes, detector diluent, ID Chip and an Instruction for use.
- If the sealed cartridge, the detector tube and the detector diluent have been stored in a refrigerator, place them on a clean and flat surface at room temperature for at least 30 minutes before testing.
- Turn on the Instrument for ichroma™ tests.
  (Please refer to the 'Instrument for ichroma™ tests Operation Manual' for complete information and operating instructions.)

TEST PROCEDURE

<Multi Mode>

1) Transfer 150 µL of detector diluent using a pipette to detector tube containing a granule. When the granule form is completely dissolved in the tube, it becomes detection buffer.
2) Transfer 30 µL of sample (Human whole blood/serum/ plasma/control) using a pipette to a detector tube.
3) Close the lid of the detector tube and mix the sample thoroughly by shaking it about 10-20 times. (The sample mixture must be used immediately.)
4) Pipette out 75 µL of a sample mixture and load it into the sample well on the cartridge.
5) Leave the cartridge at room temperature for 12 minutes before inserting the device into the holder.
   ⚠ *Scan the sample-loaded cartridge immediately when the incubation time is over. If not, it will cause inexact test result.*
6) To scan the sample-loaded cartridge, insert it into the cartridge holder of the instrument for ichroma™ tests. Ensure proper orientation of the cartridge before pushing it all the way inside the cartridge holder. An arrow has been marked on the cartridge especially for this purpose.
7) Tab the 'Start' icon on the screen.
8) The instrument for ichroma™ tests will start scanning the sample-loaded cartridge immediately.
9) Read the test result on the display screen of the instrument for ichroma™ tests.

<Single Mode>

1) Transfer 150 µL of detector diluent using a pipette to detector tube containing a granule. When the granule form is completely dissolved in the tube, it becomes detection buffer.
2) Transfer 30 µL of sample (Human whole blood/serum/ plasma/control) using a pipette to a detector tube.
3) Close the lid of the detector tube and mix the sample thoroughly by shaking it about 10-20 times. (The sample mixture must be used immediately.)
4) Pipette out 75 µL of a sample mixture and load it into the sample well on the cartridge.
5) Insert the cartridge into the holder immediately of the instrument for ichroma™ tests. Ensure proper orientation of the cartridge before pushing it all the way inside the cartridge holder. An arrow is marked on the cartridge especially for this purpose.
6) Tap the "START" button on the instrument for ichroma™ test.
7) Cartridge goes inside the instrument for ichroma™ tests and will automatically start scanning the sample-loaded cartridge after 12 minutes.
8) Read the test result on the display screen of the instrument for ichroma™ tests.

INTERPRETATION OF TEST RESULT

- Instrument for ichroma™ tests calculates the test result automatically and displays "Positive"/"Negative"/ "Indeterminate".
- Ancillary value is served in the form of a cut-off index (COI).

Cut-off index (COI)	Result	Note
≤ 0.90	Negative for anti-HCV.	No need to additional test.
0.90 < COI < 1.0	Indeterminate.	Need to retest.
≥ 1.0	Positive for anti-HCV.	Need to confirmation test.

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 **ichroma™ Anti-HCV**. For more information regarding obtaining the control materials, contact Boditech Med Inc.'s Sales Division for assistance.
  (Please refer to the instruction for use of control material.)

PERFORMANCE CHARACTERISTICS

- **Analytical Sensitivity**
  - Cut-off
    ichroma™ Anti-HCV decides between positive and negative through COI calculated by ichroma™ II algorism.

Cut-off Index (COI)	Result
COI ≥ 1.0	Positive
0.90 < COI < 1.0	Indeterminate
COI ≤ 0.90	Negative

- **Analytical Specificity**
  - Cross-reactivity
    There was no significant cross-reactivity in the ichroma™ Anti-HCV tests with mentioned cross-reactivity materials.

No	Cross-reactivity material
1	Cytomegalovirus (CMV)
2	Epstein-Barr virus (EBV)
3	Hepatitis A virus (HAV)
4	Anti-HBV
5	Hepatitis B surface antigen (HBsAg)
6	Herpes simplex virus (HSV)
7	Rubella virus
8	Varicella-zoster virus (VZV)
9	Syphilis
10	Anti Nuclear Antibody (ANA)
11	Rheumatoid factor (RF)
12	Samples of pregnant women

  - Interference
    There was no significant interference from these material with the **ichroma™ Anti-HCV** test.

No.	Materials	Concentration
1	Heparin	100,000 U/L
2	EDTA	2 mg/mL
3	Sodium citrate	0.15 M
4	Bilirubin	500 µM
5	Hemoglobin	2 g/L
6	Triglycerides	37 mmol/L
7	Cholesterol	20 mM
8	BSA	60 g/L

- **Precision**
  - Between LOT
    One person tested three different lots of **ichroma™ Anti-HCV**, ten times at each concentration of the control standard.
  - Between person
    Three different persons tested same LOT of **ichroma™ Anti-HCV**, five times at each concentration of the control standard.
  - Between day
    One person tested one LOT of **ichroma™ Anti-HCV** during three days, five times at each concentration of the control standard.
  - Between site.
    One person tested one LOT of **ichroma™ Anti-HCV** in three different space, five times at each concentration

of the control standard.

Cal	Between lot		Between person	
	Positive/ Number of tests	Positive rate	Positive/ Number of tests	Positive rate
Negative	0/30	0%	0/15	0%
Mid	30/30	100%	15/15	100%
Low	30/30	100%	15/15	100%

Cal	Between day		Between site	
	Positive /Number of tests	Positive rate	Positive /Number of tests	Positive rate
Negative	0/15	0%	0/15	0%
High	15/15	100%	15/15	100%
Mid	15/15	100%	15/15	100%
Low	15/15	100%	15/15	100%

- **Comparability with reference product**

		Reference product		
		Positive	Negative	Total
ichroma™ Anti-HCV	Positive	96	2	98
	Negative	1	425	426
	Total	97	427	524

- Positive Comparability: 98.97 %
- Negative Comparability: 99.53 %

REFERENCES

1. HCV infection: pathogenesis, clinical manifestations and therapy. Antonelli A *et al*., *Clin Exp Rheumatol*. 2008 Jan-Feb;26(1 Suppl 48):S39-47
2. Managing occupational risks for hepatitis C transmission in the health care setting. Henderson DK *et al*., *Clin Microbiol*. Rev. 2003 Jul;16(3):546-68.
3. KASL clinical practice guidelines: management of hepatitis C. Korean Association for the Study of the Liver(KASL) *et al*., *Clin Mol Hepatol*. 2014; 20(2): 89-136.

Note: Please refer to the table below to identify various symbols.

	Sufficient for <n> tests
	Read instruction for use
	Use by Date
	Batch code
	Catalog number
	Caution
	Manufacturer
	In vitro diagnostic medical device
	Temperature limit
	Do not reuse

For technical assistance; please contact:
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