

TISENC

Carcinoembryonic Antigen (CLIA) PACKAGE INSERT



INTENDED USE

Carcinoembryonic Antigen (CLIA) is a chemiluminescence immunoassay test for the quantitative measurement of circulating Carcinoembryonic Antigen (CEA) in human serum or plasma (Heparin lithium or EDTA), which is intended as an aid to assess to observe the curative effect, judge the prognosis and monitor the recurrence of malignant tumor.

The test must be performed on the ACCRE series analyzers (including ACCRE 6, ACCRE 8, ACCRE90, ACCRE100, ACCRE120 and all other ACCRE series analyzers).

For *in vitro* diagnostic use only. For professional use only.

SUMMARY

Carcinoembryonic Antigen (CEA), a glycoprotein with a molecular weight of about 200KD, was first found in colon cancer and normal fetal digestive tract.^{1,2} CEA is mainly expressed in embryo and is thought to play an important role in cell differentiation and apoptosis. After Birth, the expression of CEA is suppressed and the serum concentration of CEA in healthy people is very low.³ CEA is widely found in gastric cancer, liver cancer and pancreatic cancer, especially in colon cancer.⁴ Elevation of CEA will also be found in patients with benign diseases such as pancreatitis, colitis, chronic hepatitis and other diseases.⁵ In addition, smoking can also cause the increase of CEA.⁶ Therefore, CEA is not a specific indicator of malignant tumor and is not recommended for screening cancer in the general population. However, CEA detection can be used in the treatment management of cancer, especially colon cancer. CEA testing can determine whether a cancer has recurred or metastasized after treatment or surgery. After treatment or surgery, continue increase of CEA levels indicates incomplete resection or tumor recurrence and falling of CEA levels into the normal range indicates treatment or surgery success.⁷

ASSAY PRINCIPLES

The Carcinoembryonic Antigen (CLIA) hereinafter also referred to as the “CEA”, is a two-sites immunoassay sandwich method with enzyme catalytic chemiluminescence detection (CLIA). The principle is described as follow:

Reagents for the assay are ready-to-use and pre-dispensed in the sealed reagent cartridges. All of the assay steps are performed automatically by the instrument.

The sample was manually pipette into the sample well of reagent cartridge, then sample, CEA antibody labeled with alkaline phosphatase and CEA antibody labeled magnetic particles are mixed thoroughly together, incubating at at 37°C. The analyte in the sample, labelled antibody and magnetic particles were bonded together as sandwich immuno-complex. The immuno-complex was then washed to eliminate the unbound components in the sample. The substrate was added to trigger the chemiluminescent reaction, the resulting chemiluminescent reaction was measured by photomultiplier tube (PMT) as relative light units (RLUs). At the end the results were automatically calculated by the ACCRE analyzer in relation to the calibration curve stored.

CONTENT OF THE KIT

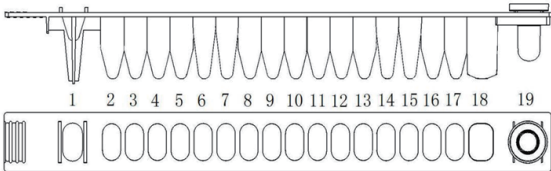
Package: 60 tests/kit with quality controls, 36 tests/kit with quality controls, 60 tests/kit without quality controls, 36 tests/kit without quality controls

Contents	Quantities				Notice
	REF W85A	REF W85C	REF W141A	REF W141C	
CEA Reagent Cartridge	60 strips	36 strips	60 strips	36 strips	Ready to Use
CEA Calibrator 1 (CAL1)	1.0 ml x 1 vial	1.0 ml x 1 vial	1.0 ml x 1 vial	1.0 ml x 1 vial	Mops buffer, 50mM; ProClin300,0.5g/L; BND,0.2g/L; BSA,10g/L; Human carcinoembryonic antigen ,2.0ng/mL
CEA Calibrator 2 (CAL2)	1.0 ml x 1 vial	1.0 ml x 1 vial	1.0 ml x 1 vial	1.0 ml x 1 vial	Mops buffer,50mM; ProClin300,0.5g/L; BND,0.2g/L; BSA,10g/L; Human carcinoembryonic antigen ,100ng/mL
CEA Quality Control Level 1 (QC1)	1.0 ml x 1 vial	1.0 ml x 1 vial	/	/	Mops buffer,50mM; ProClin300,0.5g/L; BND,0.2g/L; Human carcinoembryonic antigen ,2ng/mL; Only for the configuration with Quality Controls
CEA Quality Control Level 2 (QC2)	1.0 ml x 1 vial	1.0 ml x 1 vial	/	/	Mops buffer,50mM; ProClin300,0.5g/L; BND,0.2g/L; Human carcinoembryonic antigen ,30ng/mL; Only for the configuration with Quality Controls
Instruction for Use	1	1	1	1	N/A
Reagent Registration Card	1	1	1	1	N/A
Calibrator Barcode Sheet	1	1	1	1	N/A
Quality Control Sheet	1	1	/	/	Only for the configurations with Quality Controls

Traceability: This method has been standardized against WHO 73/601.

The Reagents Cartridge

The strip consists of 19 wells. The 1st well is the sample well and the last well 19th is the reading well for chemiluminescent signal. From the 2nd to the 18th well are all covered with a label, aluminum foil seal. The label comprises a barcode which mainly indicates the reagent assay information, reagent lot number and expiration date. All Reagent components needed for the assay are ready-to-use and pre-dispensed in the cartridges. And please do not interchange integral component from different reagents or lots.



Description of The Reagent Cartridge

Well	Component	Content	Volume
5	Sample Diluent	Tris Buffer,50mmol/L; ProClin300,0.5g/L; BND,0.2g/L; BSA,5g/L	160μL
7	Magnetic Particles	Mouse anti-CEA antibody coated magnetic particles,0.2g/L; Tris Buffer,50mmol/L; ProClin300,0.5g/L; BND,0.2g/L	50μL
9	Enzyme Label	ALP (alkaline phosphatase) labeled mouse anti-CEA antibody , 2.0 mg/mL; MES Buffer, 50mmol/L; ProClin300,0.5g/L; BND,0.2g/L	50μL
10, 11, 12	Wash Solutions	Tris Buffer,50mmol/L; ProClin300,0.5g/L; BND,0.2g/L	350μL
16	Substrate	Disodium [(4-chlorophenyl) sulfonyl] (10-methyl-9(10H)-acridinylidene) methyl phosphate	200μL

Note: Well 1, 2, 3, 4, 6, 8, 13, 14, 15, 17, 18 are empty.

MATERIALS AND DISPOSABLES REQUIRED BUT NOT PROVIDED

- Sample diluent (manufactured by Tisenc)
- Pipette with disposable tip to dispense 200 μL.
- Powderless, disposable gloves.
- For other specific materials and disposables, please refer to the Instrument User Manual.
- Instruments of the ACCRE series analyzers.

WARNINGS AND PRECAUTIONS

- For *in vitro* diagnostic use only.
- For professional use only by qualified laboratory personnel.
- The kit contains products of human origin. No known analysis method can totally guarantee the absence of transmissible pathogenic agents. It is therefore recommended that these products be treated as potentially infectious and handled observing the usual safety precautions (see Laboratory Biosafety Manual - WHO - Geneva - latest edition).
- This kit contains products of animal origin. Certified knowledge of the origin and/or sanitary state of the animals does not totally guarantee the absence of transmissible pathogenic agents. It is therefore recommended that these products be treated as potentially infectious, and handled observing the usual safety precautions (do not ingest; do not inhale).
- Do not use reagents after the expiration date indicated on the box label.
- Do not use if the packaging of reagent cartridge is damaged or leaked.
- Do not use the reagents if the quantity is obviously sufficient.
- If any component adheres to inside wall of wells or aluminum film of the reagent cartridge, please gently switch the reagent cartridge to let the component back the wells.
- Do not reverse the reagent cartridge. Otherwise, the result will be unreliable.
- Do not mix reagents (or disposables) from different lots.
- Package insert instructions must be carefully followed. Reliability of assay results cannot be guaranteed if there are any deviations from the instructions in this package insert
- Use powderless gloves, as powder has been reported to cause false results for certain enzyme immunoassay tests.

STORAGE

- Store the Carcinoembryonic Antigen (CLIA) kits **upright** at 2-8°C, kits can be stored for 18 months from manufactured date.After the reagent cartridge is on-board in the ACCRE analyzer, the testing should be finished within 2 hours.

- Store the calibrators and quality controls at 2-8°C till expiry date.When opened, the calibrators and/or controls will be stable for 30 days at 2-8°C and longer time at -20°C or below -20°C for 90 days. Calibrators and quality controls can only be frozen and thawed once.
- Keep away from sunlight.
- Do not freeze reagents cartridge.

SAMPLES

The sample volume for Carcinoembryonic Antigen (CLIA) assay is 40μL, please note that at least 65μL of sample has to be pipetted manually into the reagent cartridge.

Sample type and collection

Human serum or plasma (Heparin lithium or EDTA-K₂ or EDTA-K₃) are recommended.

Types of tubes:

- Plastic tube with clot activator,
- Plastic tube with clot activator and separation gel,
- Plastic tube with Heparin lithium,
- Plastic tube with EDTA-K₂.
- Plastic tube with EDTA-K₃.

It is recommended to validate collection tubes before using them as some may contain substances which interfere with test results.

Note: Blood sampling tube results may vary from one manufacturer to another depending on the materials and additives used.

It is the responsibility of each laboratory to validate the type of sample tube used and to follow the manufacturer’s recommendations for use.

Sample preparation

The current revision of the WHO/DIL/LAB/99.1 document provides recommendations for the preparation of samples.

For use of the sample tubes, follow the tube manufacturer’s instructions for use.

The pre-analytical step, including the preparation of blood samples, is an essential part of medical analyses. In accordance with Good Laboratory Practice, this step is performed under the responsibility of the laboratory manager.

Insufficient clot time can result in the formation of fibrin with micro-clots that are invisible to the naked eye. The presence of fibrin, red blood cells, or suspended particles can lead to erroneous results.

Samples containing suspended fibrin particles or erythrocyte stroma should be centrifuged before testing.

If there is a lipid layer over the sample after centrifuging, please transfer the clear sample into a new sample tube without transferring the lipid layer.

Severe hemolysis samples (hemoglobin >1000mg/dL) or heat-inactivated samples are not recommended for applying on the reagents.

Preparation of frozen-stored samples: after thawing, these samples must be thoroughly mixed before testing.

Mix using a vortex-type mixer. If necessary, clarify samples by centrifuging before testing.

Sample stability

Samples (serum and plasma) can be stored at room temperature (15-30°C) for up to 8 hours or at 2~8°C for up to 7 days; if longer storage is required, freeze the serum or plasma at -20°C or below -20°C for up to 6 months without exceeding 3 freeze/thaw cycles.

INSTRUCTIONS FOR USE

For complete instructions, see the Instrument User Manual.

When using the assay for the first time:

Register the assay using the registration code in the reagent kit before any assay is used

in the ACCRE analyzer for the first time. Calibration, QC and sample test are only available after assay was registered successfully.

When opening a new lot of reagents:

Each new lot of reagent must be registered by using the registration code in Reagent Registration Card within the reagent kit.

Calibration

Calibration must be performed with the reagents and calibrators from Manufacturer. Calibration is necessary under the following conditions:

- (1) New reagent lot number applied;
- (2) Same lot of reagents used more than 4 weeks;
- (3) Quality control out of control;
- (4) When necessary, for example: system maintenance or repair that may affect the analytic performance.

Test Procedure

1. Remove the kit from storage at 2-8°C and take out the required number of reagent cartridges. Allow the reagent cartridges, specimens, calibrators, and/or controls to equilibrate to room temperature (15-30°C) prior to testing.
2. Use each assay CEA strips for each sample, calibrator or control respectively.
3. Place the reagent cartridges into the reagent rack.
4. Manually pipette the Samples, Calibrators or Controls into the sample well of each reagent cartridge.

Please note that at least 65µL of sample has to be pipetted manually into the reagent cartridge and 40µL sample is needed for each test.

(Before pipetting: Mix the samples using a vortex-type mixer if necessary, and ensure that the samples and sample diluent (if applicable) DO NOT have any bubbles. The same for calibrators and controls.)

5. Put the sample rack into the reagent chamber of the ACCRE analyzer.
6. Place the assay tips into the reagent chamber of the ACCRE analyzer.
7. Input Sample ID, sample type, dilution etc. into the software as directed in the USER MANUAL.
8. Carcinoembryonic Antigen (CLIA) assay will be completed within approximately 15 minutes. Assays will be performed automatically by the ACCRE analyzer.
9. After assay is completed, remove the reagent rack from the ACCRE analyzer. Dispose the used reagent cartridge into an appropriate recipient

Dilution

Samples with concentrations above 1000 ng/mL can be diluted with negative serum or plasma or sample diluent manually. The recommended dilution is 1:50. After manual dilution, multiply the result by the dilution factor. ACCRE analyzer cannot perform automatic dilution for samples.

Quality Control

Quality control should be performed in accordance with local regulations or requirements related to accreditation, as well as requirements defined in the laboratory's quality control procedure.

RESULTS AND INTERPRETATION

Calculation of Results

The results are automatically calculated by the ACCRE analyzer using stored calibration curve which generated by 2-point calibration, and calculated according to a predefined mathematical model, the results expressed in ng/mL.
1 ng/mL CEA corresponds to 16.9 mIU/mL.

Interpretation of Results

Results of CEA assays are determined by testing specimens from a study in clinical centers with group of totally 440 healthy adult individuals in China. The 95th percentile value is 4.95ng/mL.

* Please note that results may differ between laboratories due to variations in population and test method. If necessary, each laboratory should establish its own reference range.

LIMITATIONS

1. For diagnostic purposes, results should be used in conjunction with other data; e.g., symptoms, results of other tests, clinical impressions, etc.
2. Please note that heterophile antibody in human serum or plasma can interfere the test result.
3. High concentration of HAMA can also cause a false positive or false negative result.
4. If the test results are inconsistent with clinical evidence, additional testing is suggested to confirm the result.
5. The detection range of the kit is 0.2ng/mL~1000ng/mL. Samples with CEA concentration below the upper detection limit can be quantified, if the concentration is above the upper detection limit, the results are reported as >1000ng/mL. The product supports manual sample dilution of 1:50 and can be diluted with negative serum or plasma or sample diluent .

PERFORMANCE CHARACTERISTICS

Lower limit of measurement

LoB (Limit of Blank) = 0.2ng/mL.

The Limit of Blank were determined in accordance with the CLSI® (Clinical and Laboratory Standards Institute) EP17-A2 requirements.

Measurement range

The measurement range is the range of values corresponding to the acceptable performance limits (precision and linearity). The measurement range of the Carcinoembryonic Antigen (CLIA) assay is 0.2ng/mL to 1000 ng/mL.

Linearity

Linearity was evaluated according to CLSI® EP06-A recommendations. The Carcinoembryonic Antigen (CLIA) assay is linear between 0.2ng/mL and 1000ng/mL. The absolute linear correlation coefficient(r) should be bigger than 0.9900.

Precision

A precision study was performed according to CLSI® EP05-A3 recommendations. The Within-lot precision CV% is less than 10%. The between-lot precision CV% is less than 15%.

Interfering Substances

Potential interference substances were studied according to CLSI® EP07-A3 recommendations. No significant interference was detected up to the maximum concentrations tested.

Substance	Concentration
Hemoglobin	≤1000mg/dL
Bilirubin	≤30mg/dL
Triglyceride	≤1500mg/dL
Total Protein	≤5g/dL
Rheumatoid factor	≤1500IU/mL

WASTE DISPOSAL

Dispose of used or unused reagents as well as any other contaminated disposable materials following procedures for infectious or potentially infectious products. It is the responsibility of each laboratory to handle waste and effluents produced according to their nature and degree of hazardousness and to treat and dispose of them (or have them treated and disposed of) in accordance with any applicable regulations.

INDEX OF SYMBOLS

Symbol	Meaning	Symbol	Meaning	Symbol	Meaning
	Consult instructions for use		Contains sufficient for <n> tests		Date of manufacture
	In vitro diagnostic medical device		Use-by date		Do not re-use
	Temperature limit		Batch code		Catalogue number
	Keep away from sunlight		Keep dry		Manufacturer
	Authorized representative in the European Community/ European Union		Do not use if package is damaged and consult instructions for use		Contains biological material of animal origin
	Biological risks		Caution		CE marking
	Upright		Fragile, handle with care		Do not roll
	Control				

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