

TISENC

Ferritin (CLIA) PACKAGE INSERT



INTENDED USE

Ferritin (CLIA) is a Chemiluminescence Immunoassay test for use on ACCRE series of instruments, for the quantitative measurement of circulating Ferritin (Ferr) in human serum or plasma, which is intended as an aid to diagnosis of iron metabolism-related diseases, such as hemochromatosis and iron deficiency anemia. The assay can be used for samples over the range of 1ng/mL-2000ng/mL. The test must be performed at the ACCRE series analyzers (including ACCRE 6, ACCRE 8, ACCRE 90, ACCRE 100, ACCRE 120 and other ACCRE series analyzers).

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

SUMMARY

Ferritin is known as iron-storage protein and is synthesized by many body cells. It is found mainly in the liver, spleen, muscle and bone marrow, with only a small fraction found in blood. The amount of ferritin in serum serves as an indicator of the iron reserves, showing if too little (e.g., iron deficiency anemia) or too much iron is available (e.g., hemochromatosis). The protein is involved in the cellular uptake, storage and release of iron. Ferritin has a double function: storage of iron in its bioavailable organization and at the same time protection of the cells from the toxic effects of iron, caused by iron’s capacity to generate reactive species which can directly damage DNA and proteins.

ASSAY PRINCIPLES

The principle of Ferritin (CLIA) hereinafter also referred to as the “Ferr” combines a two-sites immunoassay sandwich method with enzyme catalytic chemiluminescence detection (CLIA). The principle is described as following: Reagents for the assay are ready-to-use and pre-dispensed in the sealed reagent cartridges. All the assay steps are performed automatically by the ACCRE analyzer. The sample is manually pipetted into the sample well of reagent cartridge. The sample, the sample treatment solution and the mouse anti-Ferr monoclonal antibody labeled with alkaline phosphatase are added to the magnetic beads coated with the mouse anti-Ferr monoclonal antibody, and after mixing and incubation, the antigen in the sample and the antibody on the magnetic beads and the antibody labeled alkaline phosphatase binds to form an antibody-antigen complex. After the reaction was completed, the magnetic field adsorbed the magnetic beads and the unbound material was removed by four washings. After the reaction substrate was added, the luminescence intensity was measured by a photomultiplier tube. The concentration of the substance to be detected in the sample is proportional to the intensity of the luminescence. At the end, the results were automatically calculated by the ACCRE analyzer in relation to the calibration curve stored.

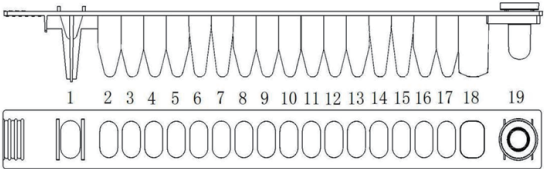
CONTENT OF THE KIT

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
The calibrator in the kit has been traced to National standard 150540 for immunoassay of ferritin. For specific calibrator concentration values, see the Calibrator Barcode Sheet for each lot.

Contents	Quantities				Notice
	W06A	W06C	W62A	W62C	
Ferr Reagents Cartridges	60 strips	36 strips	60 strips	36 strips	Ready to Use
Ferr 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	Phosphate buffer, 50mM; ProClin300, 0.48g/L; BND, 0.2g/L
Ferr 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	Phosphate buffer, 50mM; ProClin300, 0.48g/L; BND, 0.2g/L; Recombinant Ferr protein, 50ng/mL
Ferr Calibrator3 (CAL3)	1.0 mL x 1 vial	1.0 mL x 1 vial	1.0 mL x 1 vial	1.0 mL x 1 vial	Phosphate buffer, 50mM; ProClin300, 0.48g/L; BND, 0.2g/L; Recombinant Ferr protein, 500ng/mL
Ferr Quality Control Level 1 (QC1)	1.0 mL x 1 vial	1.0 mL x 1 vial	/	/	Phosphate buffer, 50mM; ProClin300, 0.48g/L; BND, 0.2g/L; Recombinant Ferr protein, 50ng/mL Only for the configurations with Quality Controls
Ferr Quality Control Level 2(QC2)	1.0 mL x 1 vial	1.0 mL x 1 vial	/	/	Phosphate buffer, 50mM; ProClin300, 0.48g/L; BND, 0.2g/L; Recombinant Ferr protein, 500ng/mL Only for the configurations 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

Note: Refer to the target value list of the controls from Quality Control Sheet within the kit.

Reagent 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 Reagents components needed for the assay are ready-to-use and pre-dispensed in the cartridge. And please do not interchange integral component from different reagents or lots.



Description of The Reagent Cartridge

Well	Component	Content	Volume
5	Sample Treatment Solution (R3)	Tris buffer, 50mmol/L; ProClin300, 0.48g/L; BND, 0.2g/L	160μL
7	Magnetic Particles(R1)	Anti-Ferr antibody coated magnetic particles, 0.2g/L; Tris Buffer, 50mmol/L; ProClin300, 0.48g/L; BND, 0.2g/L	50μL
9	Enzyme Label (R2)	ALP (alkaline phosphatase) labeled anti-Ferr antibody (Rat), 3.0 mg/L; MES Buffer, 50mmol/L; ProClin300, 0.48g/L; BND, 0.2g/L	50μL
10, 11, 12, 14	Wash Solutions	Tris Buffer, 50mmol/L; ProClin300, 0.48g/L; BND, 0.2g/L	350μL
16	Substrate	APS-5	100μL

Note: Well 1, 2, 3, 4, 6, 8, 13, 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.
- 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 insufficient.
- 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 Ferritin(CLIA) kits including reagent cartridges, calibrators and quality controls **upright** 2~8℃ in the dark place and the kit can be valid 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.
- When opened, the calibrators will be stable for 30 days at 2~8℃, stable for 3 months at -20℃. Calibrators can only be frozen and thawed once.
- When opened, the quality controls will be stable for 30 days at 2~8℃.
- Keep away from sunlight.
- Do not freeze reagent cartridges.

SAMPLES

The sample volume for Ferritin (CLIA) assay is 40μL, please note that at least 60μL of sample must be pipetted manually into the reagent cartridge.

Sample type and collection
Human serum or plasma (Heparin sodium, 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 sodium,
- 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 >500mg/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 with a vortex-type mixer. If necessary, clarify samples by centrifuging before testing.

Sample Stability
Samples (serum and plasma) can be stored at 15-30℃ for up to 8 hours or at 2~8℃ for up to 7 days; if longer storage is required, freeze the serum or plasma at -20℃ 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 cartridge. Allow the reagent cartridges, specimens, calibrators, and/or controls to equilibrate to room temperature (15-30°C) prior to testing.
2. Use each assay Ferr strips for each sample, calibrator or control respectively.
3. Place the reagent cartridge into the reagent rack.
4. Manually pipette the Sample, Calibrator, or Controls into the sample well of each reagent cartridge.

Please note that 60µL 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 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 by the USER MANUAL.
8. Ferritin (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 and assay tips into an appropriate recipient.

Dilution

Samples with concentrations above 2000ng/mL can be diluted with sample diluent manually. The recommended dilution is 1:10. And the concentration after dilution should be more than 40ng/mL. After manual dilution, multiply the result by the dilution factor. ACCRE analyzer cannot perform automatic dilution for samples.

Quality Control

Quality control can 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 generate by 3-point calibration, and calculated according to a predefined mathematical model, the results expressed in ng/mL.

Interpretation of Results

The detection range is from 1ng/mL to 2000ng/mL. For samples with ferritin below the upper limit of detection, quantitative determination can be performed; if the sample is lower than the lower limit of detection, the reported result is <1 ng/mL; if the sample is higher than the upper limit of detection, the reported result is >2000 ng/mL. Results of Ferritin (CLIA) assays are determined by testing serum specimens from a study in clinical centers with group of totally 375 healthy adult individuals in China (204 male and 171 female). The 2.5th and 97.5th percentile value is as follows:

Group	Number	2.5 th and 97.5 th Percentile value (ng/mL)
Male	204	26.81-383.6
Females	171	11.63-168.2

** 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.*

In interpreting the results, patient's clinical condition including symptoms, diseases history, and other relevant data and information should be considered.

LIMITATIONS

1. If the test results are inconsistent with clinical evidence, additional testing is suggested to confirm the result.
2. For diagnostic purposes, results should be used in conjunction with other data; e.g., symptoms, results of other tests, clinical impressions, etc.
3. Please note that heterophile antibody in human serum or plasma can interfere the test result.
4. High concentration of HAMA can also cause a false positive or false negative result

PERFORMANCE CHARACTERISTICS

Detection limits

LOD (Limit of Detection) = 1ng/mL.
LOD was determined according to CLSI® EP17-A2 recommendations.

Measurement range

The measurement range is the range of values corresponding to the acceptable performance limits (precision and linearity).
The measurement range of the Ferritin (CLIA) assay is: 1ng/mL ~ 2000ng/mL.

Linearity

Linearity was evaluated according to CLSI® EP06-A recommendations. The Ferritin (CLIA) assay is linear between 1ng/mL to 2000ng/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%.

Accuracy

The national standard is used as the sample for testing, and the relative deviation of the measurement results is within the range of ±10%.
The sample with the correctness control product with traceability is used for the detection, and the relative deviation between the detection result and the calibration concentration is within ±10%.

Interference

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	≤500 mg/dL
Bilirubin	≤20 mg/dL
Triglyceride	≤3000 mg/dL
Total Protein	≤10 g/dL
Rheumatoid factors	≤1500 IU/mL

Hook effect

No hook effect was found up to Ferr antigen concentrations of 30000ng/mL.

HAMA

Patient samples containing human anti-mouse antibodies (HAMA) may give falsely elevated or decreased values. Although HAMA-neutralizing agents are added, extremely high HAMA serum concentrations may occasionally influence results.

WASTE DISPOSAL

Dispose 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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