PATHOZYME®FERRITIN Ref OD407

Enzyme-Immunoassay (EIA) for the quantitative determination of FERRITIN in human serum

Store at 2°C to 8°C. DO NOT FREEZE.

For in-vitro diagnostic use only.

INTRODUCTION

One of the most prevalent disorders of man is the dietary deficiency of iron resulting in anaemia. Therefore, the assays of iron total binding capacity and other assessments of iron compounds in the body are clinically significant.
Iron storage compounds in the body include haemoglobin, haemosiderin, myoglobulin and the cytochromes. In most tissues, Ferritin is a major iron storage protein. Human Ferritin has a molecular weight of approximately 45,000 daltons and consists of a protein shell around an iron core; each molecule of Ferritin may contain as many as 4,000 iron atoms. Under normal conditions, this may represent 25% of the total iron found in the body. In addition, Ferritin can be found in several isomers.
High concentrations of Ferritin are found in the cytoplasm of the reticuloendothelial system, the liver, spleen and bone marrow. Methods previously used to measure iron in such tissues were invasive, caused patient trauma and lacked adequate sensitivity.
The measurement of Ferritin in serum is useful in determining changes in body iron storage and is non-invasive with relatively little patient discomfort. Serum Ferritin levels can be measured routinely and are particularly useful in the early detection of iron-deficiency anaemia in apparently healthy people.
Serum Ferritin measurements are also clinically significant in the monitoring of the iron status of pregnant women, blood donors, and renal dialysis patients. High Ferritin levels may indicate iron overload without apparent liver damage, as may be noted in the early stages of idiopathic haemochromatosis. Ferritin levels in serum have also been used to evaluate clinical conditions not related to iron storage, including inflammation, chronic liver disease and malignancy.

INTENDED USE

PATHOZYME FERRITIN is an Enzyme Immunoassay (EIA) for the quantitative determination of Ferritin in human serum.
For professional use only.

PRINCIPLE OF THE TEST

Specific anti-Ferritin antibodies are coated on to microtitration wells. Test sera are applied. Then monoclonal anti-Ferritin labelled with Horseradish Peroxidase enzyme (Conjugate) is added. If human Ferritin is present in the sample, it will combine with the antibody on the well and the enzyme Conjugate, resulting in the Ferritin molecules being sandwiched between the solid phase and the enzyme linked antibodies. After incubation, the wells are washed with distilled water to remove unbound labelled antibodies. On addition of the Substrate (TMB), a colour will develop only in those wells in which enzyme is present, indicating the presence of Ferritin. The reaction is stopped by the addition of dilute Hydrochloric Acid and the absorbance is then measured at 450nm. The concentration of Ferritin is directly proportional to the colour intensity of the test sample.
This test has been calibrated against NIBSC-Who 80/602, human liver standard.

CONTENTS

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Microtitre Plate	**12 x8 wellsx 1**
Breakable wells coated with specific antibody contained in a resealable foil bag with a desiccant.	
Cal A 0 ng /ml	**0.5 ml**
Reference Standard: Human serum free of Ferritin. Ready to use. (Colourless)	
Cal B 15 ng /ml	**0.5 ml**
Reference Standard: Ferritin diluted in human serum. Ready to use. (Colourless)	
Cal C 80 ng /ml	**0.5 ml**
Reference Standard: Ferritin diluted in human serum. Ready to use. (Colourless)	
Cal D 250 ng /ml	**0.5 ml**
Reference Standard: Ferritin diluted in human serum. Ready to use. (Colourless)	
Cal E 500 ng /ml	**0.5 ml**
Reference Standard: Ferritin diluted in human serum. Ready to use. (Colourless)	
Cal F 1000 ng /ml	**0.5 ml**
Reference Standard: Ferritin diluted in human serum. Ready to use. (Colourless)	
Conj	**11 ml**
Anti-Ferritin HRP Conjugate: Anti-Ferritin conjugated to Horseradish Peroxidase. Ready to use. (pink)	
Subs TMB	**11 ml**
Substrate Solution: 3,3', 5,5' Tetramethyl Benzidine in a citrate buffer. Ready to use. (Colourless)	
Soln Stop HCl 1M	**11 ml**
Stop Solution: Hydrochloric Acid diluted in purified water. Ready to use. (Colourless)	
Instruction Leaflet and EIA Data Recording Sheet	**1 + 1**

MATERIAL REQUIRED BUT NOT PROVIDED

Micropipettes: 100µl, 200µl and 1000µl
Disposable pipette tips
Absorbent paper
Microplate reader fitted with a 450nm filter
Graph paper
Thoroughly clean laboratory glassware.

PRECAUTIONS

PATHOZYME FERRITIN contains materials of human origin which have been tested and confirmed negative for HCV, HIV I and II antibodies and HBsAg by FDA approved methods at single donor level. Because no test can offer complete assurance that products derived from human source will not transmit infectious agents it is recommended that the reagents within this kit be handled with due care and attention during use and disposal. Do not ingest.

PATHOZYME FERRITIN Reagents do not contain dangerous substances as defined by current UK Chemicals (Hazardous Information and Packaging for Supply) regulations. All reagents should, however, be treated as potential biohazards in use and disposal. Final disposal must be in accordance with local legislation.

PATHOZYME FERRITIN Stop Solution is Dilute Hydrochloric Acid and is therefore corrosive. Handle with care. In case of contact, rinse thoroughly with water.

PATHOZYME FERRITIN contain 1% Proclin™ 300* as a preservative which may be toxic if ingested. In case of contact, rinse thoroughly with running water and seek medical advice.

*Proclin™ 300 is a trade mark of ROHM & HAAS Limited.

STORAGE

Reagents must be stored at temperatures between 2°C to 8°C.

Expiry date is the last day of the month on the bottle and the kit label. The kit will perform within specification until the stated expiry date as determined from date of product manufacture and stated on kit and components. Do not use reagents after the expiry date.

Exposure of reagents to excessive temperatures should be avoided. Do not expose to direct sunlight.

DO NOT FREEZE ANY OF THE REAGENTS (except Standards for storage) as this will cause irreversible damage.

SPECIMEN COLLECTION AND PREPARATION

Obtain a sample of venous blood from the patient and allow a clot to form and retract. Centrifuge clotted blood sample and collect clear serum. Fresh serum samples are required.

Do not use haemolysed, contaminated or lipaemic serum for testing as this will adversly affect the results.

Serum may be stored at 2°C to 8°C for up to 48 hours prior to testing. If longer storage is required, store at –20°C for up to 1 year. Thawed samples must be mixed prior to testing.

Do not use Sodium Azide as a preservative as this may inhibit the Peroxidase enzyme system.

Fresh serum samples, with no additives, are required.

Do not use haemolysed, contaminated or lipaemic serum for testing as this will adversly affect the results.

Serum may be stored at 2°C to 8°C for up to 48 hours prior to testing. If longer storage is required, store at –20°C for up to 1 year. Thawed samples must be mixed prior to testing.

Do not repeatedly freeze-thaw the specimens as this will cause false results.

REAGENT PREPARATION

All reagents should be brought to room temperature (20°C to 25°C) and mixed gently prior to use. Do not induce foaming.

LIMITATIONS OF USE

The use of samples other than serum has not been validated in this test.
There is no reuse protocol for this product.
When making an interpretation of the test it is strongly advised to take all clinical data into consideration. diagnosis should not be made solely on the findings of one clinical assay.

ASSAY PROCEDURE

1. Bring all the kit components and the test serum to room temperature (20°C to 25°C) prior to the start of the assy.
2. One set of Standards should be run with each batch of test serum. Secure the desired number of coated wells in the holder. Record the position of the standards and the test serum on the EIA Data Recording Sheet provided.
3. Unused strips should be resealed in the foil bag containing the desiccant, using the resealing zip-lock before being replaced at 2°C to 8°C.
4. Dispense 20µl of Standards and test serum into the assigned wells.
5. Dispense 100µl of Anti-Ferritin HRP Conjugate into each well.
6. Thoroughly mix for 30 seconds. It is very important to have a complete mixing at this stage.
7. Incubate the plate for 45 minutes at room temperature (20°C to 25°C).
8. At the end of the incubation period, discard the contents of the wells by flicking plate contents into a Biohazard container. Then strike the wells sharply against absorbent paper. Ensure adequate disinfectant is contained in the Biohazard container.
9. Hand Washing: Fill the wells with a minimum of 300µl of distilled water per well. Flick plate contents into a Biohazard container. Then strike the wells sharply against absorbent paper. Wash the empty wells 5 times.
10. Strike the wells sharply onto absorbent paper or paper towel to remove all residual water droplets.

11. Machine Washing: Ensure that 300µ of distilled water is dispensed per well and that an appropriate disinfectant is added to the waste collection bottle. Wash the empty wells 5 times. After washing remove excess fluid by striking the wells sharply onto absorbent paper or paper towel to remove all residual water droplets.
12. Dispense 100µl Substrate Solution into each well and mix gently for 5 seconds.
13. Incubate in the dark for 20 minutes at room temperature (20°C to 25°C).
14. Stop the reaction by adding 100µl Stop Solution to each well.
15. Gently mix for 30 seconds to ensure that the blue colour changes completely to a yellow colour.
16. Read the optical density immediately (no later than 10 minutes) using a microplate reader with a 450nm filter.

TROUBLESHOOTING

For use by operatives with at least a minimum of basic laboratory training.

Do not use damaged or contaminated kit components.

Use a separate disposable tip for each sample to prevent cross contamination.

Duplication of all standards and specimens, although not required, is recommended.

Specimens and standards should be run at the same time to keep testing conditions the same.

It is recommended that no more than 32 wells be used for each assay run if manual pipetting is used, since pipetting of all Standards and specimens should be completed within 3 minutes. A full plate of 96 wells may be used if automated pipetting is available.

Replace caps on all reagents immediately after use.

Avoid repeated pipetting from stock reagents as this is likely to cause contamination.

Do not mix reagents or antibody coated strips from different kits. When dispensing, care should be taken not to touch the surface of the well.

Do not allow reagent to run down the sides of the well. Prior to the start of the assay bring all reagents to room temperature (20°C to 25°C). Gently mix all reagents by gentle inversion or swirling.

Once an assay has been initiated, the wells should not be allowed to become dry during the assay.

Do not contaminate the Substrate Solution as this will render the whole kit inoperative.

Check the precision and accuracy of the laboratory equipment used during the procedure to ensure reproducible results.

The unused strips should be resealed in the foil bag, containing the desiccant, using the resealing zip-lock before being replaced at 2°C to 8°C.

CALCULATION OF RESULTS

Calculate the mean absorbance value (A_{450}) for each set of Standards and specimens. Construct a standard curve by plotting the mean absorbance from each Standard against its concentration in ng/ml on graph paper. Use the mean absorbance values for each specimen.
If levels of controls or users known samples do not give expected results, test results must be considered invalid.
If using a software package choose a quadratic regression curve fit.

EXPECTED VALUES AND SENSITIVITY

The graph produced by the Calibrators should be Hyperbolic in shape with the OD450 of the Calibrators proportional to their concentration. The OD of Calibrator A should be less than 0.2 and the OD of Calibrator F should be greater than 1.5 for the assay results to be valid.

Each laboratory must establish its own normal ranges based on patient population. The results provided below are based on a limited number of healthy adult specimens. The minimum detectable concentration of ferritin by **PATHOZYME FERRITIN** is 5.0ng/ml.

	Male	Female
Number	80	90
Mean (ng/ml)	170.0	71.0
Range (ng/ml)	32.0-501.0	3.5-223.5

EVALUATION DATA

Calibrated to major competitors and in house standards.
The co-efficient of variation of **PATHOZYME FERRITIN** is less than or equal to 10%.

In an evaluation between the Omega Pathozyme Ferritin kit and the Abbott AxSYM Ferritin assay Kit for samples with levels between 1.0 and 755 ng/ml the following data was generated.

Number of Samples	98
Correlation Co-efficient	0.999
Slope	0.993
Intercept	1.013
Omega Mean	165.5 ng/ml
Abbott AxSYM Mean	165.4 ng/ml

These kits were shown to give good correlation.

REFERENCES

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4. **Hazard, J.T., Yokata, M., Arosio, P. and Drysdale, J.** *Blood* 49:139; 1977.
5. **Smimes, M.A., Addiego, Jr. J.E. and Dallman, P.R**. *Blood* 43:581; 1974.

QUICK REFERENCE TEST PROCEDURE

1. Dispense 20µl of Test Serum or Standards and 100µl of Anti-Ferritin HRP Conjugate into each well and mix thoroughly for 30 seconds.
2. Incubate for 45 minutes at room temperature (20°C to 25°C).
3. Discard well contents and wash 5 times with distilled water.
4. Add 100µl of Substrate Solution to each well. Gently shake for 5 seconds.
5. Incubate in the dark for 20 minutes at room temperature (20°C to 25°C).
6. Add 100µl of Stop Solution to each well and gently shake for 30 seconds.
7. Read the Optical Densities immediately (no later than 10 minutes) using a microplate reader with a 450nm filter.

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