KAMIYA BIOMEDICAL COMPANY

Pig Plasminogen ELISA

For the quantitative determination of Plasminogen in pig biological samples

Cat. No. KT-459

For Research Use Only.

PRODUCT INFORMATION

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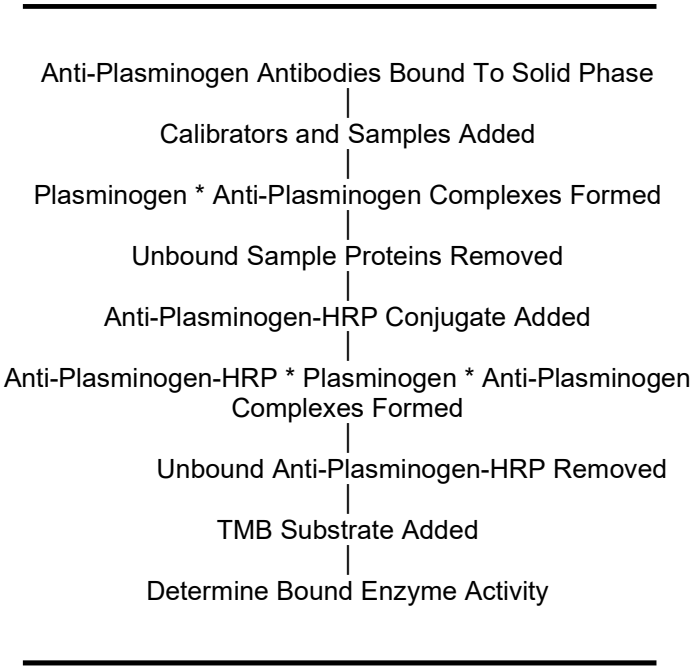
INTENDED USE
The Pig Plasminogen ELISA is a highly sensitive two-site enzyme-linked immunoassay (ELISA) for the quantitative determination of Plasminogen in pig biological samples. For research use only.

INTRODUCTION
Plasminogen (PMG) is a glycoprotein produced by the liver. It is the precursor for plasmin, which targets fibrin in the process of dissolution of fibrin blood clots. Plasminogen is present in plasma and most extravascular fluids. The important role of plasminogen in the fibrinolytic system makes it an interesting marker for various diseases.

PRINCIPLE
The principle of the double antibody sandwich ELISA is represented in Figure 1. In this assay the Plasminogen present in the sample reacts with the anti-Plasminogen antibodies which have been adsorbed to the surface of polystyrene microtiter wells. After the removal of unbound proteins by washing, anti-Plasminogen antibodies conjugated with horseradish peroxidase (HRP), are added. These enzyme-labeled antibodies form complexes with the previously bound Plasminogen. Following another washing step, the enzyme bound to the immunosorbent is assayed by the addition of a chromogenic substrate, 3,3',5,5'-tetramethylbenzidine (TMB). The quantity of bound enzyme varies directly with the concentration of Plasminogen in the sample tested; thus, the absorbance, at 450 nm, is a measure of the concentration of Plasminogen in the test sample. The quantity of Plasminogen in the test sample can be interpolated from the calibration curve constructed from the calibrators, and corrected for sample dilution.

Figure 1.



COMPONENTS
1. Diluent Concentrate
   One bottle containing 50 mL of a 20X concentrated diluent running buffer.

2. Wash Solution Concentrate
   One bottle containing 50 mL of a 20X concentrated wash solution.

3. Enzyme-Antibody Conjugate Concentrate
   One vial containing 150 µL of a 100X concentrated affinity-purified anti-pig Plasminogen antibody conjugated with HRP in a stabilizing buffer.

4. TMB Substrate Solution
   One bottle containing 12 mL of TMB and hydrogen peroxide in citric acid buffer at pH 3.3.

5. Stop Solution
   One bottle containing 12 mL of 0.3 M sulfuric acid.
   WARNING: Avoid contact with skin.

6. Microtiter Plate
   Twelve removable eight-well strips in well holder frame. Wells are coated with affinity-purified anti-pig Plasminogen.

7. Pig Plasminogen Calibrator
   One vial containing a lyophilized Pig Plasminogen Calibrator.

MATERIALS REQUIRED BUT NOT PROVIDED

- Test tubes
- Precision pipette (2 µL to 200 µL) for making and dispensing dilutions
- Squirt bottle or Microplate washer/aspirator
- Distilled or de-ionized H_2O
- Microplate reader
- Assorted glassware for the preparation of reagents and buffer solutions
- Timer
- Centrifuge for sample collection
- Anticoagulant for plasma collection

PRECAUTIONS

1. Read the instructions carefully before beginning the assay.
2. This kit is for research use only.
3. Great care has been taken to ensure the quality and reliability of this product. However, it is possible that in certain cases, unusual results may be obtained due to high levels of interfering factors.
4. Azide and thimerosal at concentrations higher than 0.1% inhibit the enzyme reaction.
5. Other precautions:
   - Do not interchange kit components from different lots.
   - Do not use kit components beyond the expiration date.
   - Protect reagents from direct sunlight.
   - Do not pipette by mouth.
   - Do not eat, drink, smoke or apply cosmetics where reagents are used.
   - Avoid all contact with the reagents by using gloves.
   - Stop solution contains diluted sulfuric acid. Irritation to eyes and skin is possible. Flush with water after contact.

REAGENT PREPARATION

1. Diluent Concentrate
   The Diluent solution supplied is a 20X concentrate and must be diluted 1:20 with distilled or de-ionized water.

2. Wash Solution Concentrate
   The Wash Solution supplied is a 20X concentrate and must be diluted 1:20 with distilled or de-ionized water. Crystal formation in the concentrate is not uncommon when storage temperatures are low. Warming of the concentrate to 30-35°C before dilution can dissolve crystals.

3. Enzyme-Antibody Conjugate Concentrate
   Calculate the required amount of working conjugate solution for each microtiter plate test strip by adding 10 µL Enzyme-Antibody Conjugate to 990 µL of 1X Diluent for each test strip to be used for testing. Dilute immediately before use and protect from light. Mix uniformly, but gently. Avoid foaming.

4. TMB Substrate Solution
   Ready to use as supplied.

5. Stop Solution
   Ready to use as supplied.

6. Microtiter Plate
   Ready to use as supplied. Unseal Microtiter Pouch and remove plate from pouch. Remove all strips and wells that will not be used in the assay and place back in pouch and re-seal along with desiccant.

7. Pig Plasminogen Calibrator
   Add 1.0 mL of distilled or de-ionized water to the lyophilized Pig Plasminogen Calibrator and mix gently until dissolved. The calibrator is now at a concentration of 20.0 µg/mL **(reconstituted calibrator should be aliquoted and frozen if future use is intended)**. **Pig Plasminogen calibrators need to be prepared immediately prior to use (see the following chart)**. Mix well between each step. Avoid foaming.

Calibrator	Concentration (ng/mL)	Calibrator Volume added to 1X Diluent →	Volume of 1X Diluent
6	200	8 µL Plasminogen Calibrator	792 µL
5	100	300 µL Calibrator 6	300 µL
4	50	300 µL Calibrator 5	300 µL
3	25	300 µL Calibrator 4	300 µL
2	12.5	300 µL Calibrator 3	300 µL
1	6.25	300 µL Calibrator 2	300 µL
0	0		600 µL

STORAGE AND STABILITY

1. Complete Kit
   The expiration date for the kit is stated on the outer label. The recommended storage temperature is 4°C. **Note: See long term storage recommendations below for the Pig Plasminogen Calibrator.**

2. Diluent
   The 20X Diluent Concentrate is stable until the expiration date. The 1X working solution is stable for at least one week from the date of preparation. Both solutions should be stored at 4°C.

3. Wash Solution
   The 20X Wash Solution Concentrate is stable until the expiration date. The 1X working solution is stable for at least one week from the date of preparation. Both solutions should be stored at 4°C.

4. Enzyme-Antibody Conjugate
   Undiluted horseradish peroxidase anti-Plasminogen conjugate is stable until the expiration date and should be stored at 4°C in the dark. **It should be diluted immediately prior to use**.

5. TMB Substrate Solution
   The TMB Substrate Solution should be stored at 4°C in the dark and is stable until the expiration date. Protect from light.

6. Stop Solution
   The Stop Solution should be stored at 4°C and is stable until the expiration date.

7. Microtiter Plate
   Anti-pig Plasminogen coated wells are stable until the expiration date and should be stored at 4°C in the sealed foil pouch with a desiccant pack.

8. Pig Plasminogen Calibrator
   The lyophilized Pig Plasminogen Calibrator should be stored at 4°C or frozen until reconstituted. The reconstituted calibrator should be aliquoted and stored frozen (avoid multiple freeze-thaw cycles). The working calibrator solutions should be prepared immediately prior to use.

INDICATIONS OF INSTABILITY

If the test is performing correctly, the results observed with the calibrator solutions should be within 20% of the expected values.

SPECIMEN COLLECTION AND HANDLING

Blood should be collected by venipuncture and the serum separated from the cells, after clot formation, by centrifugation. For plasma samples, blood should be collected into a container with an anticoagulant and then centrifuged. Care should be taken to minimize hemolysis, excessive hemolysis can impact your results. Assay immediately or aliquot and store samples at -20°C. Avoid repeated freezing/thawing.

For any sample that might contain pathogens, care must be taken to prevent contact with open wounds.

ASSAY PROTOCOL

Dilution of Samples

Due to the high-sensitive nature of the assay, each test sample should be diluted before use for a normal assay. A 1:10,000 dilution is appropriate for most serum/plasma samples. For absolute quantification of samples that yield results outside the range of the calibration curve, a lesser or greater dilution might be required. **If unsure of sample level, a serial dilution with one or two representative samples before running the entire plate is highly recommended.**

To prepare a 1:10,000 dilution of sample, transfer 5 µL of sample to 495 µL of 1X Diluent. This gives you a 1:100 dilution. Next, dilute the 1:100 sample by transferring 5 µL to 495 µL of 1X Diluent. You now have a 1:10,000 dilution of your sample. Mix thoroughly at each step.

Procedure

1. **Bring all reagents to RT before use.**
2. The Calibrators and the test sample(s) should be loaded into the ELISA wells as quickly as possible to avoid a shift in OD readings. Using a multichannel pipette would reduce this occurrence.

   Pipette 100 µL of
   - Calibrator 0 (0.0 ng/mL) in duplicate
   - Calibrator 1 (6.25 ng/mL) in duplicate
   - Calibrator 2 (12.5 ng/mL) in duplicate
   - Calibrator 3 (25 ng/mL) in duplicate
   - Calibrator 4 (50 ng/mL) in duplicate
   - Calibrator 5 (100 ng/mL) in duplicate
   - Calibrator 6 (200 ng/mL) in duplicate
3. Pipette 100 µL of diluted sample (in duplicate) into pre designated wells.
4. Incubate the Microtiter Plate at 22°C (RT) for thirty (30 ± 2) minutes. Keep plate covered and level during incubation.
5. Following incubation, aspirate the contents of the wells.
6. Completely fill each well with appropriately diluted Wash Solution and aspirate. Repeat three times, for a total of four washes. If washing manually: completely fill wells with wash buffer, invert the plate then pour/shake out the contents in a waste container. Follow this by sharply striking the wells on absorbent paper to remove residual buffer. Repeat three times for a total of four washes.
7. Pipette 100 µL of appropriately diluted Enzyme-Antibody Conjugate to each well. Incubate at 22°C (RT) for thirty (30 ± 2) minutes. Keep plate covered in the dark and level during incubation.
8. Wash and blot the wells as described in Steps 5 and 6.
9. Pipette 100 µL of TMB Substrate Solution into each well.
10. Incubate in the dark at RT for precisely ten (10) minutes.
11. After ten (10) minutes, add 100 µL of Stop Solution to each well.

12. Determine the absorbance at 450 nm of the contents of each well within 30 minutes. Calibrate the plate reader to manufacturer's specifications.

The absorbance of the final reaction mixture can be measured up to two hours after the addition of the Stop Solution. However, good laboratory practice dictates that the measurement be made as soon as possible.

RESULTS

1. Subtract the average background value from the test values for each sample.

2. Using the results observed for the calibrators construct a calibration curve. The appropriate curve fit is that of a four-parameter logistics curve. A second order polynomial (quadratic) or other curve fits may also be used.

3. Interpolate test sample values from the calibration curve. Correct for sample dilution factor to arrive at Plasminogen concentration in original sample.

QUALITY CONTROL

In accord with good laboratory practice, the assays for specific Plasminogen require meticulous quality control. Each laboratory should use routine quality control procedures to establish inter- and intra-assay precision and performance characteristics.

LIMITATION OF THE PROCEDURE

1. Reliable and reproducible results will be obtained when the assay procedure is carried out with a complete understanding of the information contained in the package insert instructions and with adherence to good laboratory practice.

2. Factors that might affect the performance of the assay include proper instrument function, cleanliness of glassware, quality of distilled or de-ionized water, and accuracy of reagent and sample pipettings, washing technique, incubation time or temperature.

FOR RESEARCH USE ONLY

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