

REFERENCES

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3. Charpak, Y, et al. (2004). Liver Transpl 10 (2): 315–319.

Porcine IgM Immunoassay

Catalog Number: SEKP-0014

For the quantitative determination of Porcine IgM concentrations in cell culture supernates, serum, and plasma.

For research use only. Not for use in diagnostic procedures.

MANUFACTURED AND DISTRIBUTED BY:

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REPEATABILITY: The coefficient of variation of both intra-assay and inter-assay were less than 10%.

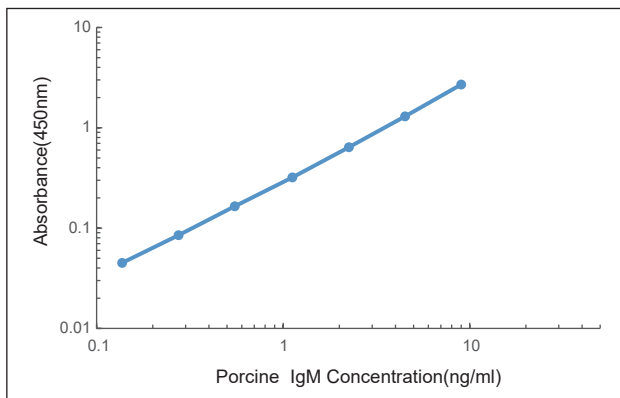
RECOVERY: The recovery of IgM spiked to three different levels in four samples throughout the range of the assay in various matrices was evaluated.

Recovery of IgM in two matrices

Sample Type	Average % of Expected Range (%)	Range (%)
Citrate plasma	92	84-101
Cell culture supernatants	95	88-104

LINEARITY: To assess the linearity of the assay, three samples were spiked with high concentrations of IgM in various matrices and diluted with the appropriate Sample Diluent to produce samples with values within the dynamic range of the assay. (The plasma samples were initially diluted 1:1)

Dilution ratio	Recovery(%)	Citrate plasma	Cell culture supernatants
1:2	Average% of Expected	95	102
	Range (%)	86-106	93-113
1:4	Average% of Expected	94	104
	Range (%)	86-102	97-112



Representative standard curve for IgM ELISA.

Performance Characteristics

SENSITIVITY: The minimum detectable dose was 50 pg/mL.

SPECIFICITY: This assay recognizes both natural and recombinant Porcine IgM. The factors listed below were prepared at 10ng/ml in Standard /sample Diluent and assayed for cross-reactivity and no significant cross-reactivity or interference was observed.

BMP1, BMP2, BMP3, BMP4, IL-2, IL-4, IL-5, IL-6, IL-8, IFN γ , TGF β 1, TGF β 2, TGF β 3, TLR1, TLR2, TLR3, TNF- α .

BACKGROUND

Immunoglobulin M (IgM) is a basic antibody that is produced by B cells. IgM is by far the physically largest antibody in the human circulatory system. It is the first antibody to appear in response to initial exposure to an antigen. The spleen is the major site of specific IgM production. IgM forms polymers where multiple immunoglobulins are covalently linked together with disulfide bonds, mostly as a pentamer but also as a hexamer. The J chain is found in pentameric IgM but not in the hexameric form. IgM has a molecular mass of approximately 970 kDa (in its pentamer form). Because each monomer has two antigen binding sites, a pentameric IgM has 10 binding sites. However, IgM cannot bind 10 antigens at the same time because the large size of most antigens hinders binding to nearby sites. Because IgM is a large molecule, it cannot diffuse well, and is found in the interstitium only in very low quantities. IgM is primarily found in serum; however, because of the J chain, it is also important as a secretory immunoglobulin. Due to its polymeric nature, IgM possesses high avidity, and is particularly effective at complement activation. By itself, IgM is an ineffective opsonin; however it contributes greatly to opsonization by activating complement and causing C3b to bind to the antigen. IgM antibodies appear early in the course of an infection and usually reappear, to a lesser extent, after further exposure. IgM antibodies do not pass across the human placenta (only isotype IgG). These two biological properties of IgM make it useful in the diagnosis of infectious diseases. Demonstrating IgM antibodies in a patient's serum indicates recent infection, or in a neonate's serum indicates intrauterine infection (e.g. congenital rubella). The development of anti-donor IgM after organ transplantation is not associated with graft rejection but it may have a protective effect.

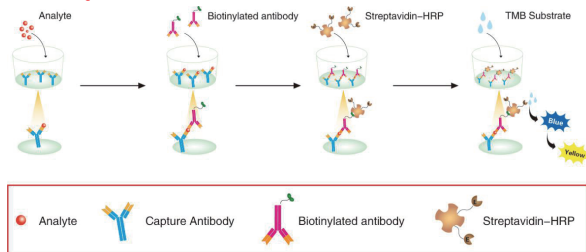
PRINCIPLE OF THE ASSAY

This assay employs the quantitative sandwich enzyme immunoassay technique. A monoclonal antibody specific for IgM has been pre-coated onto a microplate. Standards and samples are pipetted into the wells and any IgM present is captured by the coated antibody after incubation. Following extensive washing, a biotin-conjugate antibody specific for IgM is added to detect the captured IgM protein in sample. For signal development,

DESCRIPTION

horseradish peroxidase (HRP)-conjugated Streptavidin is added, followed by tetramethyl-benzidine (TMB) reagent. Following a wash to remove any unbound combination, and enzyme conjugate is added to the wells. Solution containing sulfuric acid is used to stop color development and the color intensity which is proportional to the quantity of bound protein is measurable at 450nm.

Schematic diagram:



TECHNICAL HINTS AND LIMITATIONS

- 1.This Solarbio ELISA should not be used beyond the expiration data on the kit label.
- 2.To avoid cross-contamination, use a fresh reagent reservoir and pipette tips for each step.
- 3.To ensure accurate results, some details, such as technique, plasticware and water sources should be emphasized.
- 4.A thorough and consistent wash technique is essential for proper assay performance.
- 5.A standard curve should be generated for each set of samples assayed.
- 6.It is recommended that all standards and samples be assayed in duplicate.
- 7.Avoid microbial contamination of reagents and buffers. Buffers containing protein should be made under aseptic conditions and be prepared fresh daily.
- 8.In order to ensure the accuracy of the results, the standard curve should be made every time.

DESCRIPTION

CALCULATION OF RESULTS

1. The standard curve is used to determine the amount of specimens.
2. First, average the duplicate readings for each standard, control, and sample. All O.D. values are subtracted by the mean value of blank control before result interpretation.
3. Construct a standard curve by reducing the data using computer software capable of generating a four parameter logistic (4-PL) curve-fit. As an alternative, construct a standard curve by plotting the mean absorbance for each standard on the y-axis against the concentration on the x-axis and draw a best fit curve through the points on the graph.
4. The data may be linearized by plotting the log of the IgM concentrations versus the log of the O.D. and the best fit line can be determined by regression analysis. This procedure will produce an adequate but less precise fit of the data. If samples have been diluted, the concentration read from the standard curve must be multiplied by the dilution factor.
5. This standard curve is provided for demonstration only. A standard curve should be generated for each set of samples assayed.

Typical data using the IgM ELISA

Std (ng/mL)	O.D.1	O.D.2	Average	Corrected
0	0.053	0.058	0.055	---
0.140	0.168	0.169	0.168	0.113
0.281	0.315	0.335	0.325	0.269
0.562	0.536	0.551	0.543	0.488
1.125	0.768	0.746	0.757	0.701
2.25	1.068	1.021	1.044	0.989
4.50	1.835	1.825	1.830	1.774
9.00	2.362	2.389	2.375	2.320

DESCRIPTION

***The working solution should be used within one day after dilution.**

5. **Working solution of Streptavidin-HRP(120µL)** - Centrifuge for 1 min at 6000 x g to bring down the material prior to open the vial. The vial contains 120 µL HRP Conjugate sufficient for a 96-well plate. Make 1:100 dilutions in Reagent Diluent. If the entire 96-well plate is used, add 100 µl of HRP Conjugate to 10 mL of Streptavidin-HRP Diluent to make working dilution of HRP Conjugate and mix thoroughly prior to the assay. The rest of undiluted HRP Conjugate can be stored at 4°C for up to 6 months. DO NOT FREEZE.

***The working solution should be used within one day after dilution.**

ASSAY PROCEDURE

Prepare all reagents and standards as directed. Wash the plate 3 times before assay.



Add 100µl standard or samples to each well, shaking with Micro-oscillator (100r/min) to incubate 60 minutes at room temperature(25±2°C).



Aspirate and wash 4 times

Add 100µl working solution of porcine-Conjugate anti-Porcine IgM antibody to each well, shaking with Micro-oscillator (100r/min) to incubate 60 minutes at room temperature(25±2°C).



Aspirate and wash 4 times

Add 100µl working solution of Streptavidin-HRP to each well, shaking with Micro-oscillator (100r/min) to incubate 20 minutes at room temperature (25±2°C).



Aspirate and wash 5 times

Add 100µl Substrate solution to each well, incubate 5-20 minutes (depending on signal) at room temperature(25±2°C).Protect from light.



Add 50µl Stop solution to each well. Read at 450nm within 5 minutes.

DESCRIPTION

PRECAUTIONS

The Stop Solution suggested for use with this kit is an acid solution. Wear protective gloves, clothing, eye, and face protection. Wash hands thoroughly after handling.

KIT COMPONENTS & STORAGE CONDITIONS

PART	SIZE	STORAGE OF OPENED/ RECONSTITUTED MATERIAL
Microwell Plate - antibody coated 96-well Microplate (8 wells ×12 strips)	1 plate	Return unused wells to the foil pouch containing the desiccant pack. Reseal along entire edge of the zip-seal. May be stored for up to 1 month at 2 – 8°C**
Standard - lyophilized, 18ng/ml upon reconstitution	2 vials	Aliquot and Store at -20°C** for six months
lyophilized Biotin-Conjugated antibody	1 vial	Store at 2-8°C ***for six months
Concentrated Streptavidin-HRP	1 vial	Store at 2-8°C ***for six months
Standard /sample Diluent	1 bottle	Store at 2-8°C ***for six months
Biotin-Conjugate antibody Diluent	1 bottle	Store at 2-8°C ***for six months
Streptavidin-HRP Diluent	1 bottle	Store at 2-8°C ***for six months
20 x Wash Buffer Concentrate	1 bottle	Store at 2-8°C ***for six months
Substrate Solution	1 bottle	Store at 2-8°C ***for six months
Stop Solution	1 bottle	Store at 2-8°C ***for six months
Plate Cover Seals	4 pieces	

**Provided this is within the expiration date of the kit.

OTHER SUPPLIES REQUIRED BUT NOT SUPPLIED

1. Microplate reader capable of measuring absorbance at 450 nm.
2. Pipettes and pipette tips.
3. Deionized or distilled water.
4. Squirr bottle, manifold dispenser, or automated microplate washer.
5. 500 mL graduated cylinder.

SPECIMEN COLLECTION & STORAGE

Cell Culture Supernates - Centrifuge cell culture media at 1000×g to remove debris. Assay immediately or aliquot and store samples at ≤ -20 °C. Avoid repeated freeze-thaw cycles.

Serum - Use a serum separator tube (SST) and allow samples to clot for 2 hours at room temperature or overnight at 2-8°C. Centrifuge at approximately for 15 minutes at 1000×g. Assay immediately or aliquot and store samples at ≤ -20 °C. Avoid repeated freeze-thaw cycles.

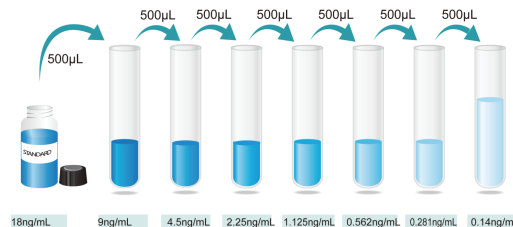
Plasma - Collect plasma using EDTA, heparin, or citrate as an anticoagulant. Centrifuge for 15 minutes at 1000×g within 30 minutes of collection. Assay immediately or aliquot and store samples at ≤ -20 °C. Avoid repeated freeze-thaw cycles.

It is recommended to conduct a pre-test before the formal experiment to determine the dilution ratio.

REAGENTS PREPARATION

1. **Temperature returning** - Bring all kit components and specimen to room temperature (20-25°C) before use.
2. **Wash Buffer** - Dilute 30mL of 20x Wash Buffer Concentrate with 570mL of deionized or distilled water to prepare 600mL of Wash Buffer. If crystals have formed in the concentrate Wash Buffer, warm to room temperature and mix gently until the crystals have completely dissolved.
3. **Standard/Sample(2 vials)** - Porcine IgM Standard has a total of 2 vials. Each vial contains the standard sufficient for generating a standard curve. Reconstitute the Standard with 1.0mL of **Standard /Sample**

Diluent. This reconstitution produces a stock solution of 18ng/mL. Allow the standard to sit for a minimum of 15 minutes with gentle agitation prior to making dilutions. Pipette 500µL of **Standard /Sample Diluent** into 9ng/ml tube and the remaining tubes. Use the stock solution of 18ng/mL to produce a 2-fold dilution series (below). Mix each tube thoroughly (vortex 20 sec for each of dilution step) and change pipette tips between each transfer. The 9 ng/mL standard serves as the high standard. The **Standard /Sample Diluent** serves as the zero standard (0 pg/mL).



Preparation of Porcine IgM standard dilutions

***If you do not run out of re-melting standard, store it at -20°C. Diluted standard shall not be reused.**

4. **Working solution of Biotin-Conjugate anti-Porcine IgM antibody(1 vial)** - The lyophilized Detection Antibody should be stored at 4°C to -20°C in a manual defrost freezer for up to 6 months, if not used immediately. Centrifuge for 1 min at 6000 x g to bring down the material prior to open the vial. The vial contains sufficient Detection Antibody for a 96-well plate. Add 110 µL of sterile Biotin-Conjugate antibody Diluent to each vial and vortex 30 sec to obtain the stock solution. If the entire 96-well plate is used, take 25µL of detection antibody stock solution into 10 mL of Biotin-Conjugate antibody Diluent to make working dilution of Detection Antibody and mix thoroughly prior to the assay. If the partial antibody is used. make a 1:400 dilution of the concentrated Biotin-Conjugate solution with the Biotin-Conjugate antibody Diluent in a clean plastic tube.