HUMAN TOTAL MMP-9 ELISA KIT

FOR THE QUANTITATIVE DETERMINATION OF HUMAN TOTAL MMP-9 CONCENTRATIONS IN SERUM AND EDTA PLASMA

PURCHASE INFORMATION:

ELISA Name	Human MMP-9 ELISA
Catalog No.	SK00160-01
Formulation	96 T
Standard range	31.25-2000 pg/mL
Sensitivity	15.6 pg/mL
Sample require	10-20 µl
Dilution Factor	100 (Optimal dilutions should be determined by each laboratory for each application)
Sample Type	Serum, EDTA Plasma
Specificity	Human MMP-9 (Pro- and active form)
Intra-assay Precision	4-6%
Inter-assay Precision	8-12%
Storage	4 °C

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Order Contact:
AVISCERA BIOSCIENCE INC.
2348 Walsh Ave., Suite C
Santa Clara, CA 95051
Tel: (408) 982 0300
Fax: (408) 982 0301
Email: Sales@AvisceraBioscience.com
Info@AvisceraBioscience.com
www.AvisceraBioscience.com

INTRODUCTION

Human MMP-9 Immunoassay is a 3.5 - 4.5 hour solid phase ELISA designed to measure Human Total MMP-9 (Pro-MMP-9 92KD and Active Form 82KD) in cell culture supernates, and plasma. It contains recombinant Human MMP-9 and antibodies raised against this protein. It has been shown to accurately quantitie recombinant Human MMP-9. Results obtained with naturally occurring MMP-9 samples showed linear curves that were parallel to the standard curves obtained using the kit standards. These results indicate that the Immunoassay kit can be used to determine relative mass values for natural Human MMP-9.

PRINCIPLE OF THE ASSAY

This assay employs the quantitative sandwich enzyme immunoassay technique. A monoclonal antibody specific for MMP-9 has been pre-coated onto a microplate. Standards and samples are pipetted into the wells and any MMP-9 present is bound by the immobilized antibody. After washing away any unbound substances, a biotinylated polyclonal antibody specific for MMP-9 is added to the wells. Following a wash to remove any unbound antibody reagent, a Streptavidin HRP conjugate is add to the wells. After washing away any unbound enzyme, a substrate solution is added to the wells and color develops in proportion to the amount of MMP-9 bound in the initial step. The color development is stopped and the intensity of the color is measured.

LIMITATIONS OF THE PROCEDURE

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_ The kit should not be used beyond the expiration date on the kit label.

_ Do not mix or substitute reagents with those from other lots or sources.

_ It is important that the Dilution Buffer selected for the standard curve be consistent with the samples being assayed.

_ If samples generate values higher than the highest standard, dilute the samples with the appropriate Dilution Buffer and repeat the assay.

_ Any variation in standard diluent, operator, pipetting technique, washing technique, incubation time or temperature, and kit age can cause variation in binding.

_ This assay is designed to eliminate interference by soluble receptors, binding proteins, and other factors present in biological samples. Until all factors have been tested in the Immunoassay, the possibility of interference cannot be excluded.

MATERIALS PROVIDED

Description	Code	Quantity
MMP-9 Microplate - 96 well polystyrene microplate (12 strips of 8 wells) coated with a purified monoclonal IgG against MMP-9.	160-06-01	1 plate
MMP-9 Standard – 2 ng/vial of recombinant Human MMP-9 in a buffered protein base with preservatives; lyophilized.	160-06-02	1 vial
Detection Antibody– 1.2 mL / vial, 10-fold concentrated of a purified polyclonal IgG against MMP-9 with preservatives; lyophilized.	160-06-03	1 vial
Antibody Solution-12 mL/vial of buffered protein based solution containing NGS with preservatives	AS01	1 vial
Positive Control – one vial of recombinant MMP-9 , lyophilized	160-06-04	1 vial
Streptavidin-HRP Conjugate -75 μl/vial, 200-fold concentrated solution of Streptavidin conjugate to HRP	SAHRP	1 vial
Dilution Buffer- 60mL/vial of buffered protein based solution with preservatives	DB01	1 vial
Wash Buffer -50 ml/vial, 10-fold concentrated buffered surfactant, with preservative.	WB01	1 vial
TMB Substrate Solution-13 ml / vial of TMB substrate solution	TMB01	1 vial
Stop Solution（0.5M HCL）, 13 ml /vial of 0.5M HCL	S-STOP	1 vial

Plate Covers – Plate sealer.	EAPS	1

STORAGE

Unopened Kit: Store at 2 - 8° C for up to 6 months. For longer storage, unopened Standard, Positive Control and Detection Antibody Concentrated as well as Dilution Buffer should be stored at -20 or -70 °C. Do not use past kit expiration date.
Opened / Reconstituted Reagents: Reconstituted Standard, Antibody Solution SHOULD BE STORED at -20 °C or – 70°C for up to one months. Streptavidin-HRP Conjugate 200-fold concentrated and other components may be stored at 2 - 8°C for up to 6 months.
Microplate Wells: Return unused wells to the plastic bag containing the desiccant pack, reseal along entire edge of zip-seal. May be stored for up to 6 months at 2 - 8° C.

OTHER SUPPLIES REQUIRED

- Microplate reader capable of measuring absorbance at 450 nm, with the correction wavelength set at 540 nm or 570 nm.
- Microplate shaker (250-300rpm).
- Pipettes and pipette tips.
- Deionized or distilled water.
- Squirt bottle, manifold dispenser, or automated microplate washer.
- 100 mL and 500 mL graduated cylinders.

PRECAUTIONS FOR USE

All reagents should be considered as potentially hazardous. The stop solution contains diluted Hydrochloric acid. Appropriate care, therefore, should be taken while handling this solution.
We therefore recommend that this product is handled only by those persons who have been trained in laboratory techniques and that it is used in accordance with the principles of good laboratory practice. Wear suitable protective clothing such as laboratory overalls, safety glasses and gloves. Care should be taken to avoid contact with skin or eyes. In the case of contact with skin or eyes wash immediately with water.

SAMPLE COLLECTION AND STORAGE

Serum - Use a serum separator tube (SST) and allow samples to clot for 30 minutes before centrifugation for 15 minutes at 1000 x g. Remove serum and 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 x g within 30 minutes of collection. Assay immediately or aliquot and store samples at ≤-20° C. Avoid repeated freeze-thaw cycles.

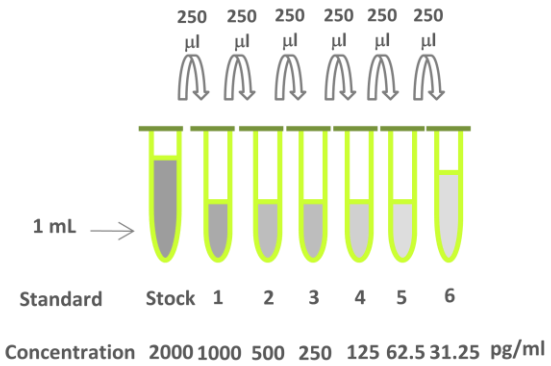
SAMPLE PREPARATION

Serum and plasma samples require a 100 -fold dilution. A suggested 100-fold dilution is 10 µL sample + 990µ L Dilution Buffer. Optimal dilutions should be determined by each laboratory for each application.
Use polypropylene test tubes.

REAGENT PREPARATION

Bring all reagents to room temperature before use.
Wash Buffer - If crystals have formed in the concentrate, warm to room temperature and mix gently until the crystals have completely dissolved. Dilute 50 mL of Wash Buffer Concentrate into deionized or distilled water (450 mL) to prepare 500 mL of Wash Buffer.
MMP-9 Standard - Refer to vial label for reconstitution volume. Reconstitute the **MMP-9** Standard with 1 ml of Dilution Buffer. This reconstitution produces a stock solution of 2000 pg/mL. Allow the standard to sit for a minimum of 15 minutes with gentle agitation prior to making dilutions. Pipette 250 µL of the appropriate Dilution Buffer into the tube #1 to #6. Use the stock solution to produce a dilution series (below). Mix each tube thoroughly before the next transfer. The 2000 pg/mL standard serves as the high standard. The appropriate Dilution Buffer serves as the zero standard (0 pg/mL).

Standard	Standard	Reagent Diluent	Concentration
stock	powder	1 ml	2000 pg/ml
# 1	250µl of stock	250µl	1000 pg/ml
# 2	250µl of 1	250µl	500 pg/ml
# 3	250µl of 2	250µl	250 pg/ml
# 4	250µl of 3	250µl	125 pg/ml
# 5	250µl of 4	250µl	62.5 pg/ml
# 6	250µl of 5	250µl	31.25 pg/ml



Detection Antibody- Reconstitute the **Detection Antibody concentrated** with 1.2 mL of Antibody Solution to produce a 10-fold concentrated stock solution. Transfer 1.2 mL of 10-fold concentrated stock solution to 10.8 mL Antibody Solution to prepare working solution. Prepare 1-2 hours prior to use. Note: That is beneficial for reduce background.

Streptavidin-HRP Conjugate - Pipette 11.94 mL of Dilution Buffer into the 15 ml centrifuge tube and transfer 60 µl of 200-fold concentrated stock solution to prepare working solution. *Note: 1 x working solution of Streptavidin-HRP Conjugate should be used within a few days.*

Positive Control- Reconstitute the **Positive Control** with 1.0 mL of Dilution Buffer. *Positive Control should be prepared and used immediately*. Reconstituted Positive Control CAN NOT BE REUSED.

ASSAY PROCEDURE

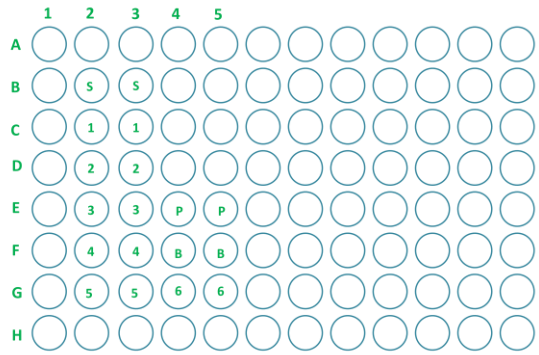
Bring all reagents and samples to room temperature before use. It is recommended that standards be assayed in duplicate.

1. Prepare all reagents and working standards as directed in the previous sections.
2. Remove excess micro-plate strips from the plate frame, return them to the foil pouch containing the desiccant pack, reseal.
3. Add 100 µL of Dilution Buffer to Blank well (F4, F5).
4. Add 100 µL of Standard (from B2 to G3, G4 to G5), sample, or positive control per well. Cover with the Sealer. Incubate for 2 hours on micro-plate shaker at room temperature. A plate layout is provided to record standards and samples assayed.
5. Aspirate each well and wash, repeating the process three times for a total of four washes. Wash by filling each well with Wash Buffer (300 µL) using a squirt bottle, manifold dispenser, or autowasher. Complete removal of liquid at each step is essential to good performance. After the last wash, remove any remaining Wash Buffer by aspirating or decanting. Invert the plate and blot it against clean paper towels.
6. Add 100 µL of Detection Antibody working solution to each well. Cover with sealer. Incubate for 2 hours on micro-plate shaker at room temperature.
7. Repeat the aspiration/wash as in step 5.
8. Add 100 µL of **Streptavidin-HRP Conjugate** working solution to each well. Incubate for 45 minutes on micro-plate shaker at room temperature.
9. Repeat the aspiration/wash as in step 5.
10. Add 100 µL of Substrate Solution to each well. Incubate for 5-15 minutes at room temperature. **Protect from light.**
11. Add 100 µL of Stop Solution to each well. The color in the wells should change from blue to yellow. If the color in the wells is green or if the color change does not appear uniform, gently tap the plate to ensure thorough mixing.
12. Determine the optical density of each well within 15 minutes, using a micro-plate reader set to 450 nm.

CALCULATION OF RESULTS

Average the duplicate readings for each standard, control, and sample and subtract the average zero standard optical density. Create a standard curve by reducing the data using computer software capable of generating a log-log 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. The data may be linearized by plotting the log of the MMP-9 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.



Calculation of samples with a concentration exceeding that of standard 2000 pg/ml may result in inaccurate, low human MMP-9 levels. Such samples require further external predilution according to expected human MMP-9 values with Dilution Buffer in order to precisely quantitate the actual human MMP-9 level.

CALIBRATION

This immunoassay is calibrated against a highly purified CH0 expressed recombinant mature form of Human MMP-9.

SENSITIVITY

Twenty-five assays were evaluated and the minimum detectable dose (MDD) of MMP-9 Was 15 pg/mL.

SPECIFICITY

This assay recognizes both natural and recombinant human MMP-9. The factors listed below were prepared at 50 ng/mL in Dilution Buffer, and assayed for cross reactivity.

Protein Name	Cross-reactivity
Human MMP-9	100%
Mouse MMP-9	0
Human MMP-1	0
Human MMP-2	0
Human MMP-3	0
Human MMP-7	0
Human MMP-8	0
Human MMP-10	0

SUMMARY OF ASSAY PROCEDURE

Prepare reagents, samples and standards
↓
Add 100µl of standard, samples, positive control to each well. Incubate 2 hours on the plate shaker at RT.
↓
Aspirate and wash 4 times.
↓
Add 100 µl Detection Antibody to each well. Incubate 2 hours on the plate shaker at RT.
↓
Aspirate and wash 4 times.
↓
Add 100 µl Anti Streptavidin HRP conjugate to each well. Incubate 45 min on the plate shaker at RT.
↓
Aspirate and wash 4 times.
↓
Add 100 µl Substrate to each well. Incubate 5-15 min on the bench top. Protect from light.
↓
Add 100 µl Stop Solution to each well. Read 450nm within 15 min

TYPICAL DATA

These standard curves* are provided for demonstration only. A standard curve should be generated for each set of samples assayed.

Standard (pg/mL)	Average OD450 (Corrected)
31.25	0.056
62.5	0.126
125	0.286
250	0.583
500	1.082
1000	1.986
2000	3.022

LINEARITY

To assess the linearity of the assay, pooled EDTA plasma samples were diluted with Dilution Buffer BD01 and assayed.

Plasma Sample	MMP-9 (pg/ml)	Final MMP-9 (pg/ml)	Recovery (%)
100 x	266.10	26610	100.00
200x	152.70	30540	114.76
400x	74.24	29696	111.60
800x	38.26	30608	115.02