

Human Mesothelin

ELISA MAX™ Deluxe Set

Cat. No. 438604



BioLegend's ELISA MAX™ Deluxe Set contains the components necessary for the quantification of recombinant and natural human Mesothelin in cell culture supernatant, serum, plasma or other biological fluids. BioLegend's ELISA MAX™ Deluxe Sets is sensitive, accurate, robust and cost-effective.

It is highly recommended that this instruction sheet be read in its entirety before using this product. Do not use this set beyond the expiration date.

Materials Provided

1. Human Mesothelin ELISA MAX™ Capture Antibody (200X)
2. Human Mesothelin ELISA MAX™ Detection Antibody (200X)
3. Human Mesothelin Standard
4. Avidin-HRP (1000X)
5. Substrate Solution A
6. Substrate Solution B
7. Coating Buffer B (5X)
8. Assay Diluent A (5X)
9. Lot-Specific Certificate of Analysis/ELISA MAX™ Deluxe Set Protocol

Introduction

Human Mesothelin is normally expressed on mesothelial cells lining the pleura, pericardium, and peritoneum, and it is also found in serum. However, the function of Mesothelin is not known. It is a potentially useful biomarker for certain cancers, particularly mesotheliomas, ovarian adenocarcinomas, pancreatic adenocarcinomas, squamous cell carcinomas, and lung cancers. As such, it has become the focus of cancer research.

Principle of the Test

BioLegend's ELISA MAX™ Deluxe Set is a Sandwich Enzyme-Linked Immunosorbent Assay (ELISA). A human Mesothelin specific mouse monoclonal antibody is first coated on a 96-well plate. Standards and samples are added to the wells, and Mesothelin binds to the immobilized capture antibody. Next, a biotinylated mouse monoclonal anti-human Mesothelin detection antibody is added, producing an antibody-antigen-antibody "sandwich". Avidin-horseradish peroxidase is subsequently added, followed by TMB Substrate Solution, producing a blue color with its intensity proportional to the concentration of Mesothelin present in the sample. Finally, the Stop Solution changes the reaction color from blue to yellow, and the microwell absorbance is read at 450 nm with a microplate reader.

For research purposes only. Not for use in diagnostic or therapeutic procedures.

438604_R03

Materials to be Provided by the End-User

- Microwell plates: BioLegend Cat. No. 423501 is recommended
- Wash Buffer: BioLegend Cat. No. 421601 is recommended, or PBS + 0.05% Tween-20
- Stop Solution: BioLegend Cat. No. 423001 is recommended, or acid solution, e.g. 2N H₂SO₄
- Plate Sealers: BioLegend Cat. No. 423601 is recommended
- PBS (Phosphate-Buffered Saline): 8.0 g NaCl, 1.16 g Na₂HPO₄, 0.2 g KH₂PO₄, 0.2 g KCl, add deionized water to 1 L; pH to 7.4, 0.2 µm filtered
- Deionized (DI) water
- A microplate reader capable of measuring absorbance at 450 nm
- Adjustable pipettes to measure volumes ranging from 2 µL to 1 mL
- Wash bottle or automated microplate washer
- Log-Log graph paper or software for data analysis
- Tubes to prepare standard dilutions
- Timer

Storage Information

- Store kit components between 2°C and 8°C.
- After reconstitution of the lyophilized standard with 1X Assay Diluent A, aliquot into polypropylene vials and store at -70°C for up to one month. Avoid repeated freeze/thaw cycles.
- Prior to use, bring all components to room temperature (18°C-25°C). Upon assay completion, return all components to appropriate storage conditions.

Health Hazard Warnings

1. Reagents that contain preservatives may be harmful if ingested, inhaled or absorbed through the skin. Refer to the MSDS online for details (www.biolegend.com/msds).
2. Substrate Solution A and Substrate Solution B are harmful if ingested. Additionally, avoid skin, eye or clothing contact.
3. To reduce the likelihood of blood-borne transmission of infectious agents, handle all serum and/or plasma in accordance with NCCLS regulations.

Specimen Collection and Handling

Cell Culture Supernatant: If necessary, centrifuge to remove debris prior to analysis. Samples can be stored at < -20°C. Avoid repeated freeze/thaw cycles.

Serum: Use a serum separator tube and allow clotting for at least 30 minutes, then centrifuge for 10 minutes at 1,000 X g. Remove serum layer and assay immediately or store serum samples at < -20°C. Avoid repeated freeze/thaw cycles. Serum specimens should be clear and non-hemolyzed.

Plasma: Collect blood sample in a citrate, heparin or EDTA containing tube. Centrifuge for 10 minutes at 1,000 X g within 30 minutes of collection. Assay immediately or store plasma samples at < -20°C. Avoid repeated freeze/thaw cycles. Plasma specimens should be clear and non-hemolyzed.

Reagent and Sample Preparation

Do not mix reagents from different kits or lots. Reagents and/or antibodies from different manufacturers should not be used with this set. All reagents should be diluted immediately prior to use.

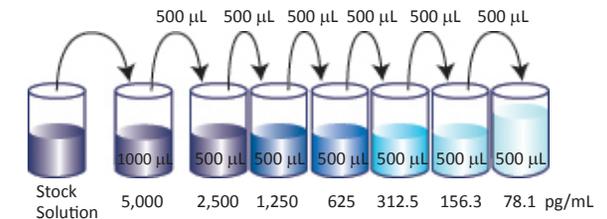
NOTE: Precipitation of 5X Assay Diluent A may be observed when stored long term between 2°C and 8°C. The precipitation does not alter the performance of the Buffer. If heavy precipitation is observed after the dilution to 1X Assay Diluent A, it can be filtered to clarify the solution.

Preparation of 1X Reagent for 1 Plate

Material	Dilute with
2.4 mL of Coating Buffer B (5X)	9.6 mL of Deionized Water
60 µL of Capture Antibody (200X)	12 mL of 1X Coating Buffer B
12 mL of Assay Diluent A (5X)	48 mL of PBS
60 µL of Detection Antibody (200X)	12 mL of 1X Assay Diluent A
12 µL of Avidin-HRP (1,000X)	12 mL of 1X Assay Diluent A

Lyophilized vials were sealed under vacuum. Reconstitute lyophilized standard with 0.2 mL of 1X Assay Diluent A. Allow the reconstituted standard to sit for 15 minutes at room temperature, then mix gently prior to making dilutions.

Prior to use, prepare 1,000 µL of the top standard at a concentration of 5,000 pg/mL from the stock solution in 1X Assay Diluent A. Perform six two-fold serial dilutions of the 5,000 pg/mL top standard with Assay Diluent A in separate tubes. After diluting, the human Mesothelin standard concentrations are 5,000 pg/mL, 2,500 pg/mL, 1,250 pg/mL, 625 pg/mL, 312.5 pg/mL, 156.3 pg/mL, and 78.1 pg/mL, respectively. Assay Diluent A serves as the zero standard (0 pg/mL).



Samples: For cell culture supernatant samples, the end user may need to determine the dilution factors in a preliminary experiment. If dilution is required, samples should be diluted in 1X Assay Diluent A before adding to the wells. It is recommended that serum and plasma samples be diluted 20-fold in 1X Assay Diluent A due to high endogenous levels.

Assay Procedure

Do not use sodium azide in any solutions, as it inhibits the activity of the horseradish-peroxidase enzyme.

1. One day prior to running the ELISA, dilute Capture Antibody in 1X Coating Buffer as described in Reagent Preparation. Add 100 µL of this Capture Antibody solution to all wells of a 96-well plate. Seal plate and incubate overnight (16-18 hrs) between 2°C and 8°C.
2. Bring all reagents to room temperature (RT) prior to use. It is strongly recommended that all standards and samples be run in duplicate or triplicate. A standard curve is required for each assay.
3. Wash plate 4 times with at least 300 µL of Wash Buffer per well and blot residual buffer by firmly tapping plate upside down on absorbent paper. **All subsequent washes should be performed similarly.**
4. To block non-specific binding and reduce background, add 200 µL of 1X Assay Diluent A per well.
5. Seal plate and incubate at RT for 1 hour with shaking on a plate shaker (e.g. 500 rpm with a 0.3 cm circular orbit). All subsequent incubation with shaking should be performed similarly.
6. While plate is being blocked, prepare the appropriate sample dilutions (if necessary) and standards.
7. Wash plate 4 times with Wash Buffer.

8. Add 100 μL /well of standards or samples to the appropriate wells. If dilution is required, samples should be diluted in 1X Assay Diluent A before being added to the wells.
9. Seal plate and incubate at RT for 2 hours with shaking.
10. Wash plate 4 times with Wash Buffer.
11. Add 100 μL of diluted Detection Antibody solution to each well, seal plate and incubate at RT for 1 hour with shaking.
12. Wash plate 4 times with Wash Buffer.
13. Add 100 μL of diluted Avidin-HRP solution to each well, seal plate and incubate at RT for 30 minutes with shaking.
14. Wash plate 5 times with Wash Buffer. For these final washes, soak wells in Wash Buffer for 30 seconds to 1 minute for each wash. This will minimize background.
15. Add 100 μL of freshly mixed TMB Substrate Solution and incubate **in the dark** for 15 minutes*. Positive wells should turn blue in color. It is not necessary to seal or shake the plate during this step.
16. Stop reaction by adding 100 μL of Stop Solution to each well. Positive wells should turn from blue to yellow.
17. Read absorbance at 450 nm within 15 minutes. If the reader can read at 570 nm, the absorbance at 570 nm can be subtracted from the absorbance at 450 nm.

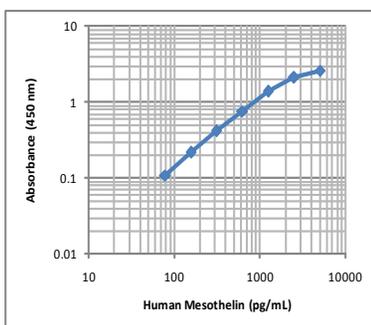
*Optimal substrate incubation time depends on laboratory conditions and the optical linear ranges of ELISA plate readers.

Calculation of Results

Plot the standard curve on log-log axis graph paper, with analyte concentration on the x-axis and absorbance on the y-axis. Draw a best fit line through the standard points. To determine the unknown analyte concentration in the samples, find the absorbance value of the unknown on the y-axis and draw a horizontal line to the standard curve. At the point of intersection, draw a vertical line to the x-axis and read the corresponding analyte concentration. If the samples were diluted, multiply by the appropriate dilution factor. The data is best calculated with computer-based curve-fitting software using a 5- or 4-parameter logistics curve-fitting algorithm. If a test sample's absorbance value falls outside the standard curve ranges, that test sample needs to be reanalyzed at a higher or lower dilution as appropriate.

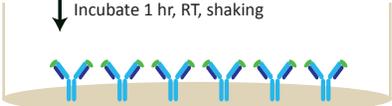
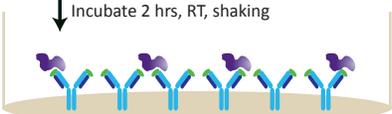
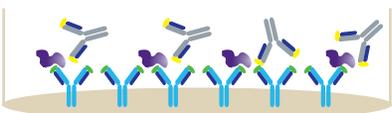
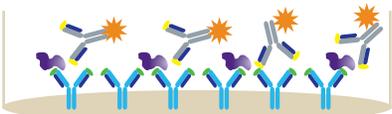
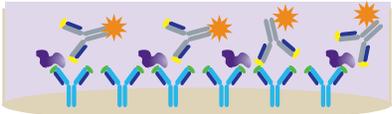
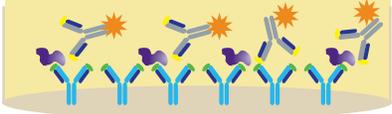
Typical Data

Standard Curve: This standard curve was generated at BioLegend for demonstration purposes only. A standard curve must be run with each assay.



Assay Procedure Summary

1. Coat plate with 100 μL diluted Capture Antibody incubate overnight, between 2°C and 8°C

2. Wash 4 times
Add 200 μL 1X Assay Diluent A
Incubate 1 hr, RT, shaking

3. Wash 4 times
Add 100 μL diluted standards and samples
Incubate 2 hrs, RT, shaking

4. Wash 4 times
Add 100 μL diluted Detection Antibody
Incubate 1 hr, RT, shaking

5. Wash 4 times
Add 100 μL Avidin-HRP
Incubate 30 min. RT, shaking

6. Wash 5 times
Add 100 μL TMB Substrate Solution
Incubate 15 min. RT, in the dark

7. Add 100 μL Stop Solution

8. Read absorbance at 450nm and 570nm

Performance Characteristics

Sensitivity: The minimum detectable concentration of Mesothelin for this set is 35.1 pg/ml (average of 20.7 ± 7.2 pg/mL in 5 assays).

Specificity: No cross reactivity was observed when this set was used to analyze 24 multiple human recombinant cytokines/chemokines/soluble receptors at up to 50 ng/mL.

Troubleshooting

High Background:

- Background wells were contaminated.
- Matrix used had endogenous analyte.
- Plate was insufficiently washed.
- TMB Substrate Solution was contaminated.

No signal:

- Incorrect or no antibodies were added.
- Avidin-HRP was not added.
- Substrate solution was not added.
- Wash buffer contains sodium azide.

Low or poor signal for the standard curve:

- Standard was incompletely reconstituted or was stored improperly.
- Reagents were added to wells with incorrect concentrations.
- Plate was incubated with improper temperature, timing, or agitation.

Signal too high, standard curves saturated:

- Standard was reconstituted with less volume than required.
- One or more reagent incubation steps were too long.
- Plate was incubated with inappropriate temperature, timing, or agitation.

Sample readings out of range:

- Samples contain no or below detectable levels of analyte.
- Samples contain analyte concentrations greater than highest standard point.

High variations in samples and/or standards:

- Pipetting errors may have occurred.
- Plate washing was inadequate or nonuniform.
- Samples were not homogenous.
- Samples or standard wells were contaminated.

BioLegend, Inc.

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