



Mouse sICAM-1 Immunoassay

Catalog Number: EA800170

For the quantitative determination of mouse sICAM-1 concentrations in cell culture supernates, serum, and plasma.

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

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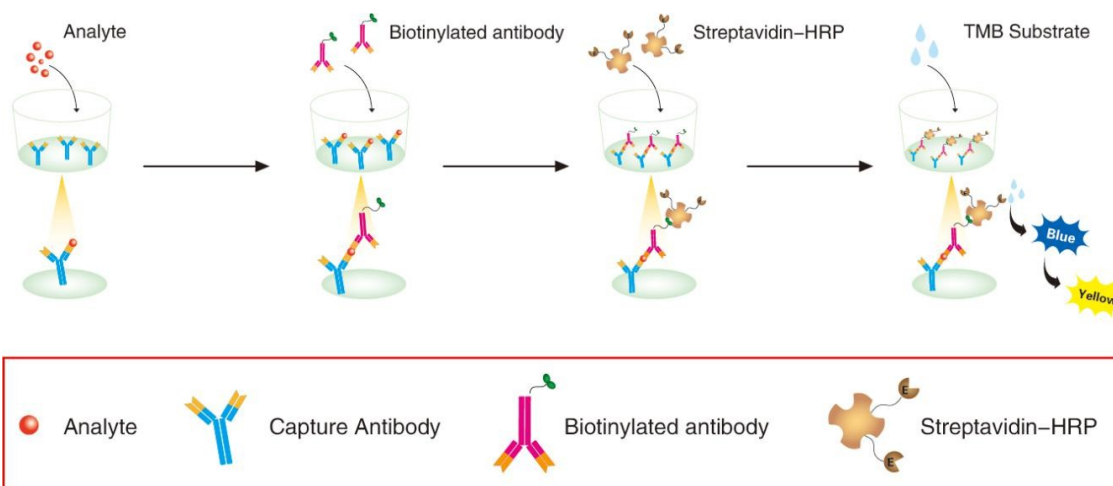
BACKGROUND

Intercellular Adhesion Molecule-1 (ICAM-1) is an inducible transmembrane molecule that plays a role in cell migration, antigen presentation and leukocyte activation. Mouse ICAM-1 is an 80-110 kDa, type I transmembrane glycoprotein that is expressed on a variety of cell types. The molecule is 537 amino acids (aa) in length and contains a 27 aa signal sequence, a 458 aa extracellular region, a 24 aa transmembrane segment, and a 28 aa cytoplasmic domain. The extracellular region contains five Ig-like domains and eleven potential N-linked glycosylation sites, many of which are utilized. The first, N-terminal Ig domain (D1) binds LFA-1, while the third domain (D3) binds Mac-1. Notably, glycosylation on the third domain regulates Mac-1 binding. The cytoplasmic domain, while short, is considered to both transduce intracellular signals (via MAP kinase) and interact with the cell cytoskeleton. Membrane ICAM-1 exists as a dimer and will form multimers via D1 interactions. Monomeric ICAM-1 is competent to bind LFA-1. Soluble, dimeric ICAM-1 does circulate and binds LFA-1 with high avidity. Soluble forms are generated via proteolytic processing, reportedly through MMP-9 and elastase. In mice, there are a number of ICAM-1 alternate splice forms that lack combinations of various Ig-domains. This suggests the possibility of multiple truncated forms of proteolytically-generated circulating ICAM-1. Mature mouse ICAM-1 shares 77%, 53%, 56%, and 52% sequence identity to rat, human, canine and porcine ICAM-1, respectively. Cells known to express ICAM-1 include smooth muscle cells, keratinocytes, endothelial cells, fibroblasts, bronchial epithelial cells, memory T cells, B cells, plasma cells, monocytes, macrophages, CFU-E, CFU-GM, activated eosinophils, neutrophils, Schwann cells, Sertoli cells, melanocytes, and dendritic cells.

PRINCIPLE OF THE ASSAY

This assay employs the quantitative sandwich enzyme immunoassay technique. A monoclonal antibody specific for sICAM-1 has been pre-coated onto a microplate. Standards and samples are pipetted into the wells and any sICAM-1 present is captured by the coated antibody after incubation. Following extensive washing, a biotin-conjugate antibody specific for sICAM-1 is added to detect the captured sICAM-1 protein in sample. For signal development, 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 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.

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, 8000 pg/vial upon reconstitution	2 vials	Aliquot and Store at -20°C** for six months
Concentrated Biotin-Conjugated antibody (100X) - 120 ul/vial	1 vial	Store at 2-8°C **for six months
Concentrated Streptavidin-HRP solution (100X) - 120 ul/vial	1 vial	Store at 2-8°C** for six months
Standard /Sample Diluent - 16 ml/vial	1 bottle	Store at 2-8°C** for six months
Biotin-Conjugate antibody Diluent - 16 ml/vial	1 bottle	Store at 2-8°C** for six months
Streptavidin-HRP Diluent - 16 ml/vial	1 bottle	Store at 2-8°C** for six months
Wash Buffer Concentrate (20x) - 30 ml/vial	1 bottle	Store at 2-8°C** for six months
Substrate Solution - 12 ml/vial	1 bottle	Store at 2-8°C** for six months
Stop Solution - 12 ml/vial	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. Squirt 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.

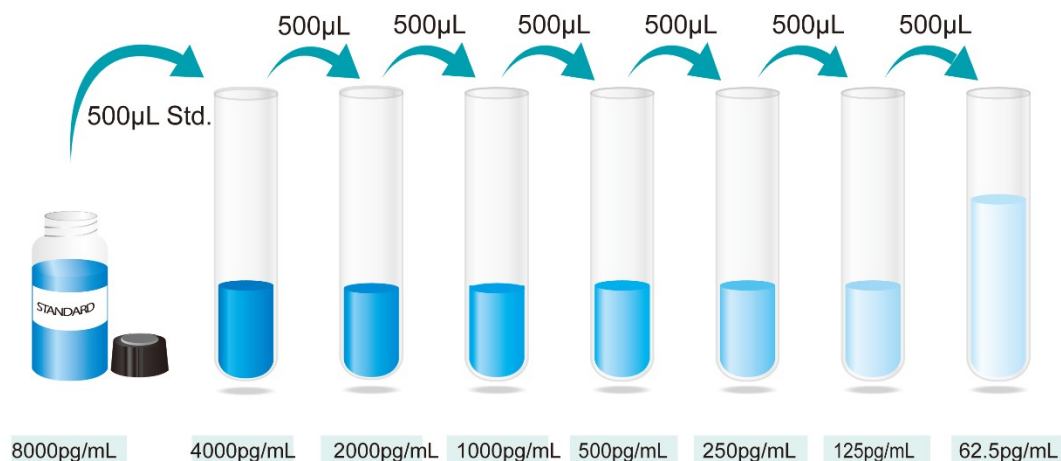
Serum - Use a serum separator tube (SST) and allow samples to clot for 2 hours at room temperature or overnight at 2-8°C. Centrifuge approximately for 15 minutes at 1000×g. Assay immediately or aliquot and store samples at ≤ -20 °C. Avoid repeated freeze-thaw cycles.

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.

Note: The normal mouse serum or plasma samples are suggested to make a 1:2 dilution.

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 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/Specimen** - Reconstitute the Standard with 1.0mL of Standard/Sample Diluent. This reconstitution produces a stock solution of 8000 pg/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 4000pg/ml tube and the remaining tubes. Use the stock solution of 8000pg/mL to produce a 2-fold dilution series (below). Mix each tube thoroughly and change pipette tips between each transfer. The 4000 pg/mL standard serves as the high standard. The Standard/ Sample Diluent serves as the zero standard (0 pg/mL).



Preparation of sICAM-1 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-mouse sICAM-1 antibody:** Make a 1:100 dilution of the concentrated Biotin-Conjugate solution with the Biotin-Conjugate antibody Diluent in a clean plastic tube.

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

- 5. Working solution of Streptavidin-HRP:** Make a 1:100 dilution of the concentrated Streptavidin-HRP solution with the Streptavidin-HRP Diluent in a clean plastic tube.

***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 120 minutes at room temperature(25±2°C). Aspirate and wash 4 times



Add 100µl working solution of Biotin-Conjugate anti-mouse sICAM-1 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 30 minutes at room temperature(25±2°C).



Aspirate and wash 5 times

Add 100µl Substrate solution to each well, incubate 10-20 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.

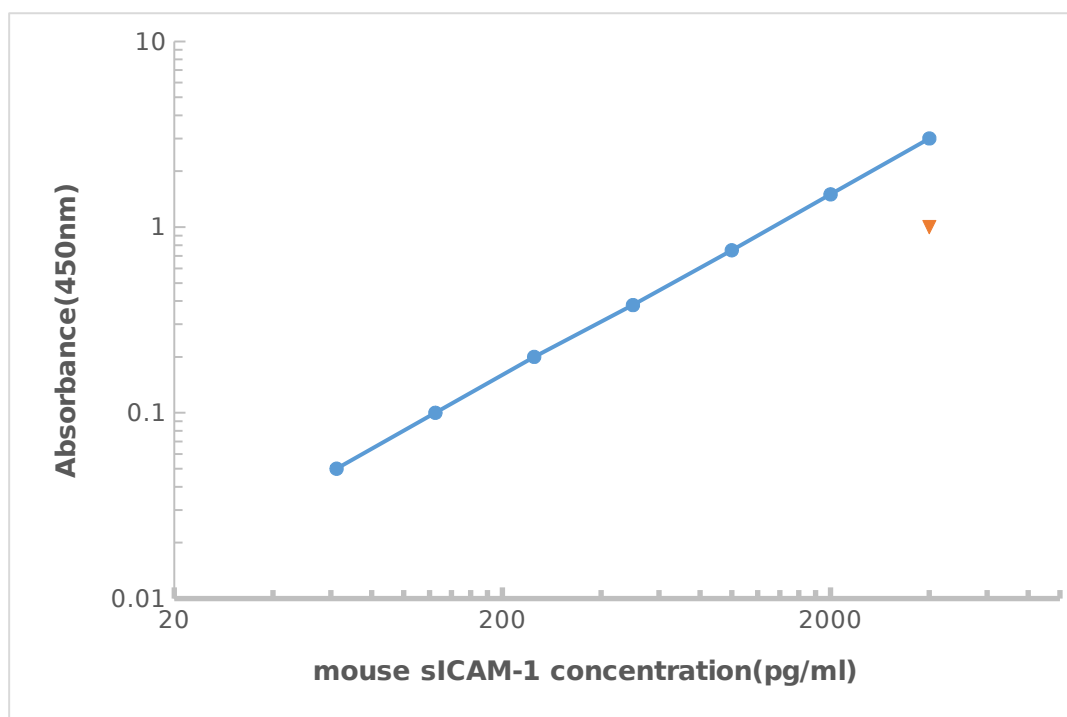
CALCULATION OF RESULTS

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 sICAM-1 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 sICAM-1 ELISA

Standard(pg/	OD.	OD.	Average	Corrected
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ml)				
0	0.018	0.010	0.014	---
62.50	0.206	0.203	0.205	0.191
125.0	0.238	0.235	0.236	0.222
250	0.354	0.349	0.352	0.338
500	0.562	0.555	0.558	0.544
1000	0.913	0.901	0.907	0.893
2000	1.487	1.466	1.477	1.463
4000	2.423	2.389	2.406	2.392



Representative standard curve for sICAM-1 ELISA.

Performance Characteristics

SENSITIVITY: The minimum detectable dose was 30pg/mL.

SPECIFICITY: This assay recognizes both natural and recombinant mouse sICAM-1. The factors listed below were prepared at 100ng/ml in Standard /sample Diluent



and assayed for cross-reactivity and no significant cross-reactivity or interference was observed.

Factors assayed for cross-reactivity

Recombinant mouse	Recombinant rat	Recombinant human
ICAM-2	ICAM-1	ICAM-1
p-selectin		ICAM-2
VCAM-1		ICAM-3

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

RECOVERY : The recovery of sICAM-1 spiked to three different levels in four samples throughout the range of the assay in various matrices was evaluated.

Recovery of sICAM-1 in two matrices

Sample Type	Average % of Expected Range (%)	Range (%)
Citrate plasma	92	84–101
Cell culture supernatants	102	93–113

LINEARITY: To assess the linearity of the assay, three samples were spiked with high concentrations of sICAM-1 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	104
	Range (%)	88–104	96–113
1:4	Average% of Expected	97	107
	Range (%)	89–105	98–116
1:8	Average% of Expected	94	105
	Range (%)	83-102	98-114
1:16	Average% of Expected	91	106
	Range (%)	82-103	94-118

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