Human TIMP-1 immunoassay kit

Catalogue Number: 31103

For the quantitative determination of human TIMP-1 concentrations
in serum, plasma and cell culture supernate samples.

This package insert must be read in its entirety before using this product.

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INTRODUCTION

Tissue inhibitor of metalloproteinases-1(TIMP-1) plays a crucial role in extracellular matrix (ECM) composition and wound healing [1]. It has been found to be strongly upregulated in liver tissue and serum during hepatic fibrogenesis in patients with liver disease and in animal models of hepatic fibrogenesis[2][3] .

PRINCIPLE OF THE ASSAY

This assay is a quantitative sandwich ELISA. The immunoplate is pre-coated with a monoclonal antibody specific for human TIMP-1. Standards and samples are pipetted into the wells and any human TIMP-1 present is bound by the immobilized antibody. After washing away any unbound substances, a biotin labelled polyclonal antibody specific for human TIMP-1 is added to the wells. After wash step to remove any unbound reagents, streptavidin-HRP conjugate (STP-HRP) is added. After the last wash step, an HRP substrate solution is added and colour develops in proportion to the amount of human TSP-2 bound initially. The assay is stopped and the optical density of the wells determined using a microplate reader. Since the increases in absorbance are directly proportional to the amount of captured human TIMP-1, the

unknown sample concentration can be interpolated from a reference curve included in each assay.

INTENDED USE

This human TIMP-1 ELISA kit is designed for quantification of human TIMP-1 in serum, plasma and cell culture supernate samples.

REAGENTS SUPPLIED

Each kit is sufficient for one 96-well plate and contains the following components:

1. Micro-titre Strips (96 wells)-Coated with a monoclonal antibody against human TIMP-1, sealed.
2. 10×Wash buffer-50 ml.
3. 5×Assay buffer-20 ml.
4. 100×Detection antibody solution-A biotin labelled polyclonal antibody against TIMP-1, 0.12 ml.
5. Human TIMP-1 standard-2000 pg of recombinant human TIMP-1 in a buffered protein base, lyophilised.
6. 200×STP-HRP solution- 0.06 ml.
7. Substrate solution- 12 ml, ready for use.
8. Stop solution- 12 ml, ready for use.

PREPARATION OF REAGENTS

Bring all reagents and materials to room temperature before assay.

A. 1×Assay buffer.

Prepare 1×Assay buffer by mixing the 5×Assay buffer (20 ml) with 80 ml of distilled water or deionized water. If precipitates are observed in the 5× Assay buffer bottle, warm the bottle in a 37°C water bath until the precipitates disappear. The 1×Assay buffer may be stored at 2-8°C for up to one month.

B. 1×Wash buffer.

Prepare 1×Wash buffer by mixing the 10×Wash buffer (50 ml) with 450 ml of distilled water or deionized water. If precipitates are observed in the 10× Wash buffer bottle, warm the bottle in a 37°C water bath until the precipitates disappear. The 1×Wash buffer may be stored at 2-8°C for up to one month.

C. 1×Detection antibody solution.

Spin down the 100×Detection antibody solution briefly and dilute the desired amount of the antibody 1:100 with 1×Assay buffer, 100 l of the 1×Detection antibody solution is required per well. Prepare only as much 1×Detection antibody solution as needed. Return the 100×Detection antibody solution to 2-8°C immediately after the necessary volume is removed.

D. 1×STP-HRP solution.

Spin down the 200×STP-HRP solution briefly and dilute the desired amount of the 200×STP-HRP solution 1:200 with 1×Assay buffer, 100 l of the 1×STP-HRP solution is required per well. Prepare only as much 1×STP-HRP solution as needed. Return the 200×STP-HRP solution to 2-8°C immediately after the necessary volume is removed.

PREPARATION OF STANDRADS AND SAMPLES

Human TIMP-1 standards: Reconstitute the lyophilised standard with 1 ml of 1×Assay buffer to generate a standard stock solution of 2000 pg/ml. Allow the standard to sit for 10 minutes with gentle agitation prior to making dilutions. Prepare serially diluted standards using 1×Assay buffer as follows:

Standard volume	Volume of 1×Assay buffer	Concentration
2000 pg/ml stock	-	2000 pg/ml
250 l of 2000 pg/ml	250 l	1000 pg/ml
250 l of 1000 pg/ml	250 l	500 pg/ml
250 l of 500 pg/ml	250 l	250 pg/ml
250 l of 250 pg/ml	250 l	125 pg/ml
250 l of 125 pg/ml	250 l	62.5 pg/ml
250 l of 62.5 pg/ml	250 l	31.2 pg/ml

1×Assay buffer serves as the zero standard (0 pg/ml).

Note: The reconstituted standard stock should be aliquoted and stored at -80ºC for up to one month. Avoid repeating freezing/thawing cycles. Please do not store the diluted standard solutions.

Sample preparation

Serum or plasma sample is generally required a 500-fold dilution in the 1×Assay buffer.

Assay procedure

It is recommended that all standards and samples should be assayed in duplicate.

1. Add 100 µl of standard or sample per well, incubate at room temperature for 2 hours.
2. Discard the content and tap the plate on a clean paper towel to remove residual solution in each well. Add 300 µl of 1×Wash buffer to each well and incubate for 1 minute. Discard the 1×Wash buffer and tap the plate on a clean paper towel to remove residual wash buffer. Repeat the wash step for a total 3 washes.
3. Add 100 µl of 1×Detection antibody solution to each well, incubate at room temperature for 1 hour.
4. Wash each well 3 times as in step 2.
5. Add 100 µl of 1×STP-HRP solution to each well, incubate at room temperature for 20 minutes.
6. Wash each well 4 times as described in step 2.
7. Add 100 µl of Substrate solution to each well, incubate at room temperature for 15 minutes. Protect from light.
8. Add 100 µl of Stop solution to each well, gently tap the plate frame for a few seconds to ensure thorough mixing.
9. Measure absorbance of each well at 450 nm immediately.

Calculation

1. Subtract the absorbance of the blank from that of standards and samples.
2. Generate a standard curve by plotting the absorbance obtained (y-axis) against human TIMP-1 concentrations (x-axis). The best fit line can be generated with any curve-fitting software by regression analysis. Any curve of 4-parameter or log-log curve fitting can be used for calculation.
3. Determine human TIMP-1 concentration of samples from standard curve and multiply the value by the dilution factor.

Typical standard curve
The following standard curve is provided for demonstration only. A standard curve should be generated for each set of sample assay.

Human TIMP-1 (pg/ml)	Absorbance (450 nm)	Blanked Absorbance
0	0.091	0
31.2	0.118	0.027
62.5	0.161	0.07
125	0.257	0.166
250	0.449	0.358
500	0.876	0.785
1000	1.544	1.453
2000	2.494	2.403

Assay CHARACTERISTICS

A. Sensitivity:
The lowest level of human TIMP-1 that can be detected by this assay is 31.2 pg/ml.

B. Precision:
Intra-assay Precision (Precision within an assay) <5.0%.

Inter-assay Precision (Precision between assays) <3.9%.

References:

[1] Patrick R. L., et al. (2012) *Cold Spring Harb Perspect Med 2: a 00627.*
[2] Morikawa N., et al. (2019) *Int Heart J 20;60(2):310-317.*

SUMmary OF Assay procedure

Add 100 µl of Standard or sample to each well.

Incubate at room temperature for 2 hours.

Aspirate and wash each well three times.

Add 100 µl of 1×Detection antibody solution to each well.

Incubate at room temperature for 1 hour.

Aspirate and wash each well three times.

Add 100 µl of 1×STP-HRP solution to each well.

Incubate at room temperature for 20 minutes.

Aspirate and wash each well four times.

Add 100 µl of Substrate solution to each well.

Incubate at room temperature for 15 minutes.

Add 100 µl of Stop solution to each well.

Measure absorbance of each well at 450 nm.

Calculation