Code No. 27174

Mouse c-MPL/TPOR Assay Kit - IBL

INTRODUCTION

Thrombopoietin promotes the growth and differentiation (proliferation) of megakaryocytes which produce platelets. TPOR (Thrombopoietin receptor), which is also called c-MPL (Myeloproliferative leukemia protein) or CD110, is a receptor for thrombopoietin. And it is suggested that TPOR may also play a role in the maintenance of hematopoietic stem cells, which are stem cells located within the bone marrow that have the potential to develop into red blood cells, white blood cells, megakaryocytes and platelets.
This receptor is activated when thrombopoietin protein binds to it, and the activated receptor stimulates a signaling pathway called the JAK/STAT pathway, which transmits signals from outside the cell to the cell's nucleus and is important for controlling the production of blood cells.
This ELISA kit can measure concentration of mouse soluble c-MPL/TPOR in serum or cell culture supernatant.

PRINCIPLE

This kit is a solid phase sandwich ELISA using 2 kinds of highly specific antibodies. Tetra Methyl Benzidine (TMB) is used as a coloring agent (Chromogen). The strength of coloring is proportional to the quantities of Mouse soluble c-MPL/TPOR.

MEASUREMENT RANGE

21.88 - 1,400 pg/mL

INTENDED USE

For research use only, not for use in diagnostic procedures.

This IBL's assay kit is capable for the quantitative determination mouse soluble c-MPL/TPOR in serum and cell culture supernatant.

KIT COMPONENT

1	Precoated plate	:	
	Anti-Mouse c-MPL (AMM2) Rat IgG MoAb Affinity Purify		96Well x 1
2	Labeled antibody Conc.	:	
	(30X) HRP conjugated Anti-Mouse c-MPL (41A1A) Mouse IgG Fab' Affinity Purify		0.4mL x 1
3	Standard	: Recombinant mouse soluble c-MPL/TPOR	0.5mL x 2
4	EIA buffer	:	30mL x 1
5	Solution for Labeled antibody	: 1% BSA, 0.05% Tween20 in PBS	12mL x 1
6	Chromogen	: TMB solution	15mL x 1
7	Stop solution	: 1N H_2SO_4	12mL x 1
8	Wash buffer Conc.	: (40X) Phosphate buffer	50mL x 1

OPERATION MANUAL

1. Materials needed but not supplied

- Plate reader (450nm)
- Micropipette and tip
- Graduated cylinder and beaker
- Deionized water
- Paper towel
- Graph paper (log/log)
- Tube for dilution of Standard
- Washing bottle for precoated plate
- Disposable test tube for "2, Labeled antibody Conc." and "6, Chromogen"

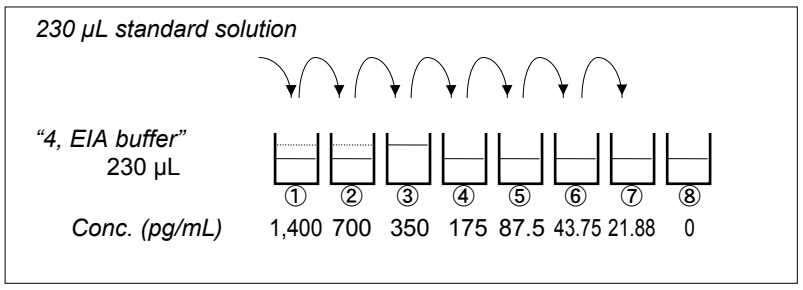
2. Preparation

1) Preparation of wash buffer
"8, Wash buffer Conc." is a concentrated (40X) buffer. Adjust the temperature of "8, Washing buffer Conc." to room temperature and then, mix it gently and completely before use. Dilute 50 mL of "8, Wash buffer Conc." with 1,950 mL of deionized water and mix it. This is the wash buffer for use. This prepared wash buffer shall be stored in refrigerator and used within 2 weeks after dilution.
2) Preparation of Labeled antibody
"2, Labeled antibody Conc." is a concentrated (30X). Dilute "2, Labeled antibody Conc." with "5, Solution for Labeled antibody" in 30 times according to required quantity into a disposable test tube. Use this resulting solution as Labeled antibody.
Example)
In case you use one strip (8 well), the required quantity of Labeled antibody is 800 µL. (Dilute 30 µL of "2, Labeled antibody Conc." with 870 µL of "5, Solution for Labeled antibody" and mix it. And use the resulting solution by 100 µL in each well.)
<u>This operation should be done just before applying labeled antibody.</u>
The remaining "2, Labeled antibody Conc." should be stored at 4°C in firmly sealed vial.
3) Preparation of Standard
Put just <u>0.5 mL</u> of deionized water into the vial of "3, Standard" and mix it gently and completely. This solution is 2,800 pg/mL Mouse soluble c-MPL/TPOR standard.
4) Dilution of Standard
Prepare 8 tubes for dilution of "3, Standard". Put 230 µL each of "4, EIA buffer" into the tube.
Specify the following concentration of each tube."

Tube-1	1,400 pg/mL
Tube-2	700 pg/mL
Tube-3	350 pg/mL
Tube-4	175 pg/mL
Tube-5	87.5 pg/mL
Tube-6	43.75 pg/mL
Tube-7	21.88 pg/mL
Tube-8	0 pg/mL (Test Sample Blank)

Put 230 µL of Standard solution into tube-1 and mix it gently. Then, put 230 µL of tube-1 mixture into tube-2. Dilute two times standard solution in series to set up 7 points of diluted standard between 1,400 pg/mL and 21.88 pg/mL. Tube-8 is the test sample blank as 0 pg/mL.

See following picture.



5) Dilution of test sample
Serum samples need to be diluted with "4, EIA buffer" suitably in this kit.
If the concentration of mouse c-MLP/TPOR in samples may not be estimated in advance, the pre-assay with several different dilutions will be recommended to determine the proper dilution of samples.

3. Measurement procedure

All reagents shall be brought to room temperature approximately 30 minutes before use. Then mix it gently and completely before use. Make sure of no change in quality of the reagents. Standard curve shall be prepared simultaneously with the measurement of test samples.

Reagents	Test Sample	Standard	Test Sample Blank	Reagent Blank
	Test sample 100 µL	Diluted standard (Tube 1-7) 100 µL	EIA buffer (Tube-8) 100 µL	EIA buffer 100 µL
Incubation for 60 minutes at room temperature (15-25°C) with plate lid				
Washing 4 times				
Labeled Antibody	100 µL	100 µL	100 µL	-
Incubation for 30 minutes at room temperature (15-25°C) with plate lid				
Washing 6 times				
Chromogen	100 µL	100 µL	100 µL	100 µL
Incubation for 30 minutes at room temperature (15-25°C) (shielded)				
Stop solution	100 µL	100 µL	100 µL	100 µL
Read the plate at 450nm against a Reagent Blank within 30 minutes after addition of Stop solution.				

1) Determine wells for reagent blank. Put 100 µL each of "4, EIA buffer" into the wells.
2) Determine wells for test sample blank, test sample and diluted standard.
Then, put 100 µL each of test sample blank (tube-8), test sample and dilutions of standard (tube-1-7) into the appropriate wells.
3) Incubate the precoated plate for 60 minutes at 37°C after covering it with plate lid.
4) Wash each well of the precoated plate 4 times with wash buffer using a washing bottle or a plate washer in following way.
After shaking off (or aspiration of) the solution in wells, fill each well with wash buffer and shake off the wash buffer completely from the precoated plate. <u>This procedure must be repeated 4 times.</u> Then, drain the precoated plate completely on paper towel.
In case of using a plate washer, we recommend manually washing in the manner mentioned above at the last one time.
Please refer to 5) and 6) in SPECIAL ATTENION below, and be careful not to miss a well.
5) Pipette 100 µL of labeled antibody solution into the wells of test samples, diluted standard and test sample blank.
6) Incubate the precoated plate for 30 minutes at 4°C after covering it with plate lid.
7) Wash the precoated plate 6 times in the same manner as 4).
In case of using a plate washer, we recommend manually washing in the manner mentioned above at the last two times.
8) Take the required quantity of "6, Chromogen" and put it into a disposable test tube. Then, pipette 100 µL from the test tube into every well. Please do not return the rest of used chromogen in the test tube into "6, Chromogen" bottle in order to avoid contamination.
9) Incubate the precoated plate for 30 minutes at room temperature in the dark. The solution of Chromogen will turn blue.
10) Add 100 µL of "7, Stop solution" to all wells. Mix the solution by tapping the side of precoated plate. The solution will turn yellow by addition of "7, Stop solution".
11) Remove any dirt or drop of water on the bottom of the precoated plate and confirm there is no bubble on the surface of the solution. Then, run the plate reader and conduct measurement at 450 nm against a reagent blank.
The measurement shall be done within 30 minutes after addition of "7, Stop solution".

SPECIAL ATTENTION

1) Test samples should be measured soon after collection. For the storage of test samples, store them frozen and do not repeat freeze/thaw cycles. Thaw the test samples at a low temperature and mix them completely before measurement.
2) Test samples should be diluted with "4, EIA buffer", suitably.
Serum samples need to be diluted with "4, EIA buffer" in this kit.
3) Duplicate measurement of test samples and standard is recommended.
4) Use test samples in neutral pH range. The contaminations of organic solvent may affect the measurement.
5) Use only wash buffer in this kit for washing the precoated plate.
Insufficient washing may lead to the failure in measurement.

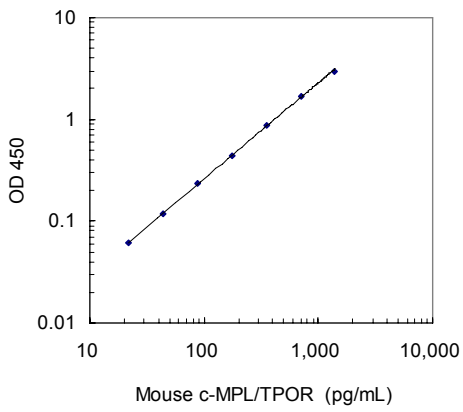
6) Remove the wash buffer completely by tapping the precoated plate on paper towel. Do not wipe wells with paper towel.
7) "6, Chromogen" should be stored in the dark due to its sensitivity against light. Avoid contact of Chromogen with metals.
8) Measurement should be done within 30 minutes after addition of "7, Stop solution".

CALCULATION OF TEST RESULT

Subtract the absorbance of test sample blank from all data, including standards and unknown samples before plotting. Plot the subtracted absorbance of the standards against the standard concentration on log-log graph paper. Draw the best smooth curve through these points to construct the standard curve. Read the concentration for unknown samples from the standard curve.

Example of standard curve

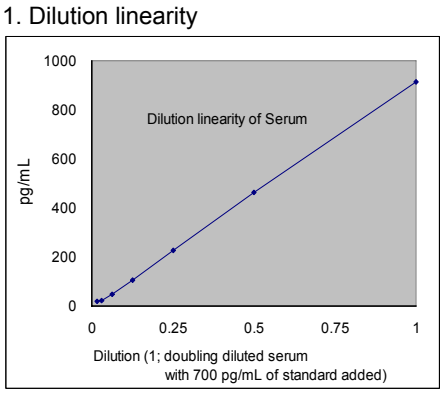
Conc. (pg/mL)	Absorbance (450nm)
1400	2.995
700	1.708
350	0.898
175	0.456
87.5	0.249
43.75	0.129
21.88	0.073
0 (Test Sample Blank)	0.012

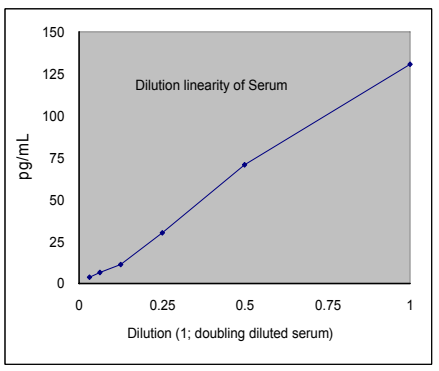


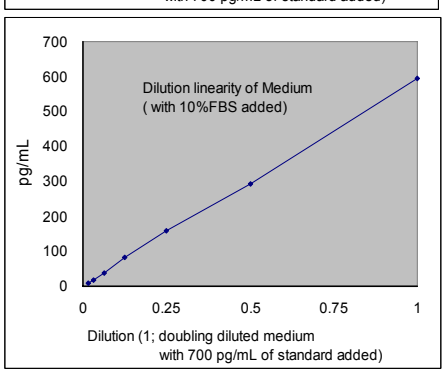
* The typical standard curve is shown above. This curve can not be used to derive test results. Please run a standard curve for each assay.

PERFORMANCE CHARACTERISTICS

1. Dilution linearity







2. Added Recovery Assay

Specimen	Additive Amount (pg/mL)	Theoretical Value (pg/mL)	Measured Value (pg/mL)	%
Mouse Serum (BALB/c) (x2)	700	817.15	787.38	96.4
	350	467.15	444.38	95.1
	175	292.15	310.17	106.2
Medium with 10% FBS (x2)	700	700	614.03	87.7
	350	350	313.61	89.6
	175	175	145.82	83.3

3. Intra - Assay

Mean Value (pg/mL)	SD (pg/mL)	CV (%)	n
539.83	34.16	6.3	24
121.26	5.30	4.4	24
37.08	1.68	4.5	24

4. Inter - Assay

Mean Value (pg/mL)	SD (pg/mL)	CV (%)	n
541.47	34.20	6.3	4
121.65	5.72	4.7	4
37.56	1.08	2.9	4

5. Specificity

Substance	Cross-Reactivity
Mouse c-MPL/TPOR	100 %
Albumin	< 0.1 %
Transferrin	< 0.1 %
Immunoglobulin	< 0.1 %

6. Sensitivity

3.5 pg/mL
The sensitivity for this kit was determined using the guidelines under the National Committee for Clinical Laboratory Standards (NCCLS) Evaluation Protocols. (National Committee for Clinical Laboratory Standards Evaluation Protocols, SC1, (1989) Villanova, PA: NCCLS.)

PRECAUTION FOR INTENDED USE AND/OR HANDLING

1. All reagents should be stored at 2 - 8°C. All reagents shall be brought to room temperature approximately 30 minutes before use.
2. "3, Standard" is lyophilized products. Be careful to open this vial.
3. "7, Stop solution" is a strong acid substance. Therefore, be careful not to have your skin and clothes contact "7, Stop solution" and pay attention to the disposal of "7, Stop solution".
4. Dispose used materials after rinsing them with large quantity of water.
5. Precipitation may occur in "2, Labeled antibody Conc.", "4, EIA buffer" or "8, Wash buffer Conc.", however, there is no problem in the performance.
6. Wash hands after handling reagents.
7. Do not mix the reagents with the reagents from a different lot or kit.
8. Do not use expired reagents.
9. This kit is for research purpose only. Do not use for clinical diagnosis.

STORAGE AND THE TERM OF VALIDITY

Storage Condition : 2 - 8°C
The expiry date is specified on outer box.

REFERENCE

1. Ivanova A, Wuerfel J, Zhang J, Hoffmann O, Ballmaier M, Dame C. Expression pattern of the thrombopoietin receptor (Mpl) in the murine central nervous system. BMC Dev Biol. 2010 Jul 28;10:77.
2. Hosokawa K, Arai F, Yoshihara H, Iwasaki H, Hembree M, Yin T, Nakamura Y, Gomei Y, Takubo K, Shiama H, Matsuoka S, Li L, Suda T. Cadherin-based adhesion is a potential target for niche manipulation to protect hematopoietic stem cells in adult bone marrow. Cell Stem Cell. 2010 Mar 5;6(3):194-8.
3. Ghinassi B, Zingariello M, Martelli F, Lorenzini R, Vannucchi AM, Rana RA, Nishikawa M, Migliaccio G, Mascarenhas J, Migliaccio AR. Increased differentiation of dermal mast cells in mice lacking the Mpl gene. Stem Cells Dev. 2009 Sep;18(7):1081-92.
4. Huang X, Sakamoto H, Ogawa M. Thrombopoietin controls proliferation of embryonic multipotent hematopoietic progenitors. Genes Cells. 2009 Jul;14(7):851-60.
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6. Miyakawa Y, Rojnuckarin P, Habib T, Kaushansky K. Thrombopoietin induces phosphoinositol 3-kinase activation through SHP2, Gab, and insulin receptor substrate proteins in BAF3 cells and primary murine megakaryocytes. J Biol Chem. 2001 Jan 26;276(4):2494-502.

Version 1.

Made in Japan.

Related Products

Code No.	Product Name	Volume
27174	**Mouse c-MPL/TPOR Assay Kit - IBL**	**96 Well**
27175	Human TPO Assay Kit - IBL	96 Well
10401	Anti-Mouse c-MPL/TPOR (AMM2) Rat IgG MoAb	100µg, 10µg
10403	Anti-Mouse c-MPL/TPOR (AMM2) Rat IgG MoAb Biotin	50µg, 5µg