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Sunlong Medical™ Human CD80/B7-1 One-Step ELISA Kit

Catalog Number: One-EL067Hu
Size: 96 Test

Storage: 2-8℃/-20℃
Validity Period: 2-8℃: 6 months; -20℃: 12 months

Sensitivity: 28.7 pg/mL
Assay range: 78.1-5000 pg/mL

For the quantitative detection of human CD80/B7-1 concentrations in serum, plasma, cell culture supernatant, urine

This package insert must be read entirely before using this product. For proper performance, follow the protocol provided with each individual kit.

FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC PROCEDURES.

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ASSAY PROCEDURE SUMMARY

1. Preset the layout of the microplate, including control group, standard group and sample group, take out the required number of microplate strips and return excess strips to the foil pouch containing the drying reagent pack and reseal; store at 4°C immediately. Microplate strips should be used in one week.

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2. Add 50 µL standard or sample to appropriate wells. To avoid high background always add samples or standards to the well before the addition of antibody cocktail.

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3. Add 50 µL 1× Antibody Cocktail solution (refer to Reagent Preparation 7.2) to each well. Seal plate with cover seal and incubate at 37℃ on a microplate thermostatic shaker set at 400 rpm for 1 hour (incubate at 37℃ for 2 hours is recommended if thermostatic shaker is not available).

↓

4. Wash: 1) Gently remove the cover seal. Discard the liquid from wells by aspirating or decanting. Remove any residual solution by tapping the plate a few times on fresh paper towels. 2) Wash 4 times with 1× Wash Buffer, using at least 350-400 µL per well. Following the last wash, firmly tap plates on fresh towels 10 times to remove residual Wash Buffer. Avoid getting any towel fibers in the wells or wells drying out completely.

↓

5. Add 100 µL TMB substrate solution to each well, protected from light. Incubate at 37°C on a microplate thermostatic shaker set at 400 rpm for 15 to 20 minutes. (Substrate Solution should remain colorless until added to the plate.)

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6. Add 100 µL Stop Solution to each well in the same order as addition of the TMB substrate. Note: Avoid skin and eye contact with the Stop solution.

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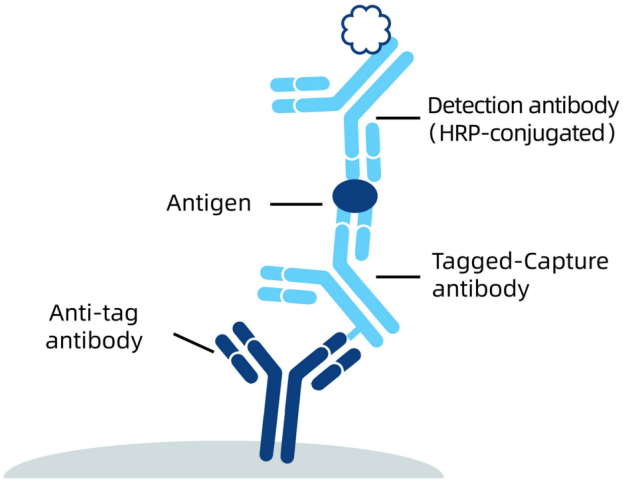
7. Read results immediately on a microplate reader at a wavelength of 450 nm. If possible, perform a double wavelength readout (450 nm and 630 nm).

DESCRIPTION

CD80, also known as B7-1, is a type I membrane protein and a member of the immunoglobulin superfamily. It plays a crucial role in T cell activation and regulation by providing a co-stimulatory signal necessary for T cell proliferation and cytokine production. CD80 interacts with CD28 on T cells to promote T cell activation and with CTLA-4 to inhibit T cell activation. This dual role highlights its importance in modulating immune responses. Additionally, CD80 acts as a receptor for adenovirus subgroup B, indicating its involvement in viral infections.

PRINCIPLE OF THE ASSAY

An anti-tag antibody is pre-coated onto the bottom of wells. After adding antigen or samples, Tagged-Capture antibody and HRP-conjugated detection antibody, a sandwich complex is formed in the solution. TMB acts as a HRP substrate, and the solution color will change from colorless to blue. A stop solution containing sulfuric acid turns the solution yellow. The color intensity is proportional to the quantity of bound protein, which is measurable at 450 nm with the correction wavelength set at 630 nm.



LIMITATIONS OF THE PROCEDURE

- FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC PROCEDURES.
- Do not use expired kit or reagents.
- Do not mix or substitute reagents or materials from other kit lots or other sources.
- If concentration of assayed factor in samples is higher than the highest standard, dilute the samples with the appropriate Sample Diluent and reanalyze.
- Any variation in testing personnel, sample preparation, standard dilution, pipetting technique, washing techniques, incubation time, temperature, kit age and equipment can cause variation in results.
- This assay is designed to eliminate interference by factors present in biological samples. Until all factors have been tested in the ELISA immunoassay, the possibility of interference cannot be excluded.

MATERIALS PROVIDED (96 Test)

Unopened kit should be stored at 2 - 8°C.

- **Microplate:** 96 well microplate precoated an anti-tag antibody (8 well × 12 strips) (1 plate)
- **Protein standard:** 10000 pg/bottle; lyophilized (2 bottles)
- **Capture antibody (100×):** 60 µL/vial* (1 vial)
- **Detection antibody, HRP-conjugated (100×):** 60 µL/vial* (1 vial)

- **Sample Diluent PT 4B1:** 30 mL/bottle. For human serum, plasma, cell culture supernatant and urine. (1 bottle)
- **Sample Diluent PT 4B1-ac:** 30 mL/bottle. For cell lysate. (1 bottle)
- **Detection Diluent:** 15 mL/bottle (1 bottle)
- **Wash Buffer Concentrate (20×):** 30 mL/bottle (1 bottle)
- **Extraction Reagent:** 15 mL/bottle (1 bottle)
- **Tetramethylbenzidine Substrate (TMB):** 12 mL/bottle (1 bottle)
- **Stop Solution:** 12 mL/bottle (1 bottle)
- Plate Cover Seals (4 pieces)

STORAGE

Store kit reagents between 2 and 8°C. Immediately after use remaining reagents should be returned to cold storage (2 to 8°C). Expiration date of the kit and reagents is stated on the labels.

Expiration date of the kit components can only be guaranteed if the components are stored properly.

	Condition
Unopened kit	Store at 2 - 8°C for 6 months or -20°C for 12 months. (See expiration date on the label.)
Opened kit	All reagents stored at 2 - 8°C for 7 days. Please use a new standard for each assay.

OTHER SUPPLIES REQUIRED

- A microplate reader capable of measuring absorbance at 450 nm with the correction wavelength set at 630 nm.
- Calibrated, adjustable precision pipettes and disposable plastic tips. A manifold multi-channel pipette is recommended for large assays.
- Plate washer: automated or manual.
- Absorbent paper towels.
- Glass or plastic tubes to prepare standard and sample dilutions.
- Beakers and graduated cylinders.
- Log-log or semi-log graph paper or computer and software for ELISA data analysis. A four-parameter logistic (4-PL) curve-fit is recommended.
- Microplate thermostatic shaker.

PRECAUTION

- Avoid any skin and eye contact with Stop Solution and TMB. In case of contact, wash thoroughly with water.
- Do not use the kit after the expiration date.
- Do not mix or substitute reagents or materials from other kit lots or other sources.
- Be sure to wear protective equipment such as gloves, masks and goggles during the experiment.
- When using an automated plate washer, adding a 30 second soak period following the addition of Wash Buffer to improve assay precision

TECHNICAL HINTS

- Bring all reagents to room temperature before use.
- To avoid cross-contamination, change pipette tips between additions of each standard level, between sample additions, and between reagent additions. Also, use separate reservoirs for each reagent.
- When using an automated plate washer, adding a 30 second soak period before washing step and/or rotating the plate between wash steps may improve assay precision.

- To ensure accurate results, proper adhesion of plate sealers during incubation steps is necessary.
- Substrate Solution should remain colorless until added to the plate. Keep Substrate Solution protected from light. Substrate Solution should change from colorless to gradations of blue.
- Stop Solution should be added to the plate in the same order as the Substrate Solution.
- The color developed in the wells will turn from blue to yellow upon addition of the Stop Solution. Wells that are green in color indicate that the Stop Solution has not mixed thoroughly with the Substrate Solution.
- It is recommended that all samples and standards be assayed in duplicate.

SAMPLE COLLECTION AND STORAGE

Serum

Allow blood samples to clot for 30 minutes, followed by centrifugation for 15 minutes at 1000xg. Clear serum can be assayed immediately or aliquoted and stored at -20℃. Avoid repeated freeze-thaw cycles.

Plasma

Use EDTA, heparin, or citrate as an anticoagulant for plasma collection. Centrifuge for 15 minutes at 1000xg within 30 minutes of collection. The plasma can be assayed immediately or aliquoted and stored at -20℃. Avoid repeated freeze-thaw cycles.

Cell Culture Supernatant

Remove particulates by centrifugation for 5 minutes at 500xg and assay immediately or aliquot and store samples at ≤ -20℃. Avoid repeated freeze-thaw cycles.

Urine

Collect urine samples and centrifuge for 20 minutes at 1000xg. Collect the aqueous layer, assay immediately or aliquot and store samples at ≤ -20℃. Avoid repeated freeze-thaw cycles.

Cell Lysate

1) Collect cells and wash by centrifuging at 500 x g for 5 minutes before resuspension in pre-cooled PBS buffer. Perform this step three times. 2) Count cells and then discard the supernatant. 3) Add protease inhibitor cocktail to the Extraction Reagent to a final concentration immediately prior to performing cell lysis. 4) Add 1 mL of Extraction reagent (containing protease inhibitor cocktail) Per 1 x 107 cells, Incubate cell suspension on ice for 30 minutes, use ultrasound to treat the samples. 5) Centrifuge cell lysate at 10,000 x g for 5 minutes at 4℃. 6) Measure the concentration of total protein in cell lysate using BCA assay. Where possible, keep samples on ice to avoid protein degradation.

REAGENT PREPARATION

Bring all reagents and samples to room temperature before use. If crystals have formed in the Wash Buffer Concentrate, warm to room temperature and mix gently until the crystals have completely dissolved.

Wash Buffer (1X)

If crystals have formed in the concentrate, warm to room temperature and mix gently until the crystals have completely dissolved. Add 30 mL of Wash Buffer Concentrate(20X) to 570 mL deionized or distilled water to prepare 1X Wash Buffer.

Antibody Cocktail (1X)

Dilute 100X capture antibody and 100X HRP-conjugated detection antibody using Detection Diluent prior to assay. Suggested 1:100 dilution: 50 µL 100X capture antibody + 50 µL 100X Detection Antibody, HRP-conjugated + 4,900 µL Detection Diluent. Mix gently but thoroughly.

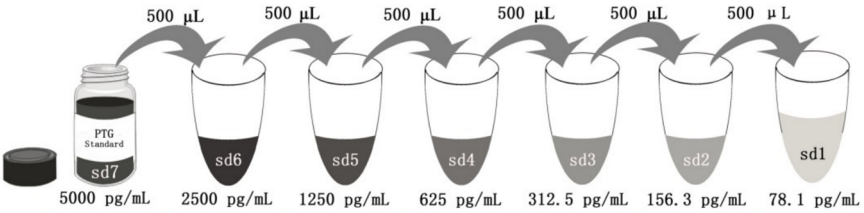
Sample Dilution

Different samples should be diluted with corresponding Sample Diluent, samples may require further dilution if the readout values are higher than the highest standard OD reading. Variations in sample collection, processing and storage may affect the results of the measurement. Recommended Dilution

for different sample types: 1:2 is recommended for human serum, plasma, cell culture supernatant and urine; 1:2 to 1:8 is recommended for cell lysate.

Standard Serial Dilution

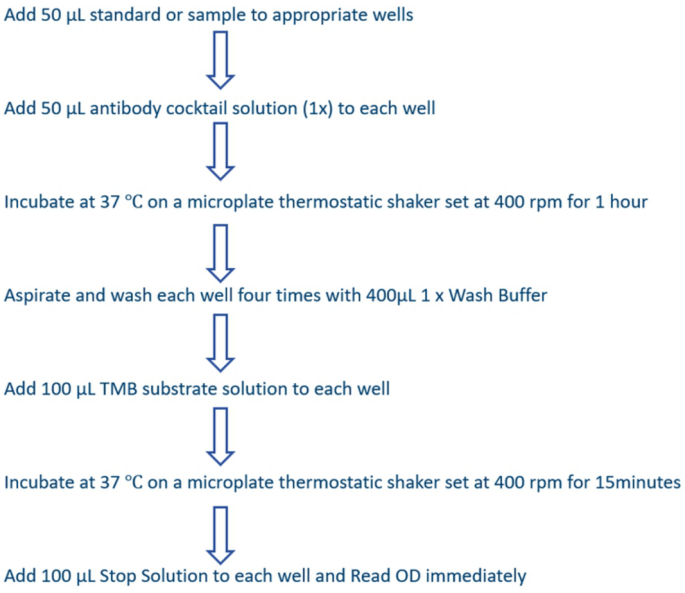
For human serum, plasma, cell culture supernatant and urine, add 2mL Sample Diluent PT 4B1 in protein standard. For cell lysate, add 2mL Sample Diluent PT 4B1-ac in protein standard.



Add # µL of Standard diluted in the previous step	—	500 µL	500 µL	500 µL	500 µL	500 µL	500 µL
# µL of Sample Diluent PT 4B1 or PT 4B1-ac	**2000 µL**	500 µL	500 µL	500 µL	500 µL	500 µL	500 µL
	"sd7"	"sd6"	"sd5"	"sd4"	"sd3"	"sd2"	"sd1"

ASSAY PROCEDURE

Bring all reagents to room temperature before use (Detection antibody, HRP-conjugated antibody can be used immediately). To avoid cross-contamination, change pipette tips between additions of each standard level, between sample additions, and between reagent additions. Also, use separate reservoirs for each reagent.



1. Preset the layout of the microplate, including control group, standard group and sample group, take out the required number of microplate strips and return excess strips to the foil pouch containing the drying reagent pack and reseal; store at 4°C immediately. Microplate strips should be used in one week.

2. Add 50 µL standard or sample to appropriate wells. To avoid high background always add samples or standards to the well before the addition of antibody cocktail.

3. Add 50 µL 1× Antibody Cocktail solution (refer to Reagent Preparation 7.2) to each well. Seal plate with cover seal and incubate at 37℃ on a microplate thermostatic shaker set at 400 rpm for 1 hour (incubate at 37℃ for 2 hours is recommended if thermostatic shaker is not available).

4. Wash: 1) Gently remove the cover seal. Discard the liquid from wells by aspirating or decanting. Remove any residual solution by tapping the plate a few times on fresh paper towels. 2) Wash 4 times with 1× Wash Buffer, using at least 350-400 µL per well. Following the last wash, firmly tap plates on fresh towels 10 times to remove residual Wash Buffer. Avoid getting any towel fibers in the wells or wells drying out completely.

5. Add 100 µL TMB substrate solution to each well, protected from light. Incubate at 37°C on a microplate thermostatic shaker set at 400 rpm for 15 to 20 minutes. (Substrate Solution should remain colorless until added to the plate.)

6. Add 100 µL Stop Solution to each well in the same order as addition of the TMB substrate. Note: Avoid skin and eye contact with the Stop solution.

7. Read results immediately on a microplate reader at a wavelength of 450 nm. If possible, perform a double wavelength readout (450 nm and 630 nm).

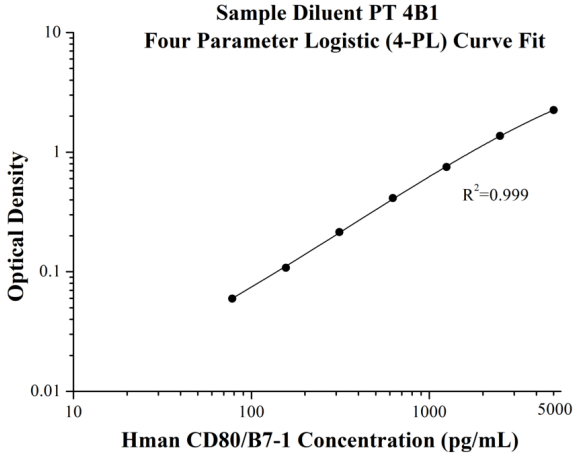
CALCULATION OF RESULTS

Data analysis: Calculate the average of the duplicate readings (OD value) for each standard and sample, and subtract the average of the zero standard absorbance. Construct a standard curve by plotting the mean absorbance for each standard on the y-axis against the concentration on the x-axis, four-parameter logistic curvefit (4-PL) analysis is recommend. If the samples have been diluted, the fitting result must be multiplied by the dilution factor used.

TYPICAL DATA

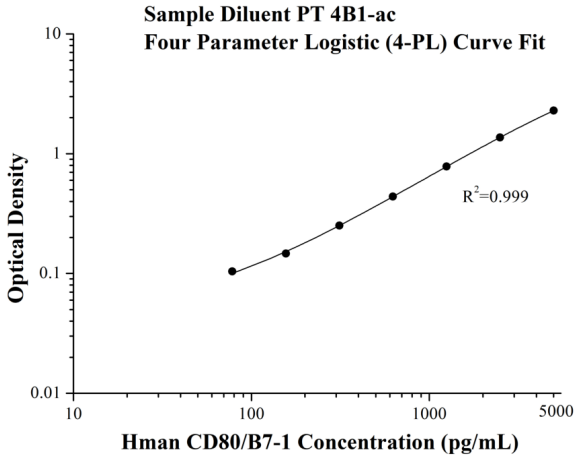
These standard curves are provided for demonstration only. A standard curve should be generated for each set of samples assayed.

Standard curve 1



(pg/mL)	O.D.	Average	Corrected
0	0.0151 0.02	0.01755	-
78.1	0.0702 0.0842	0.0772	0.05965
156.3	0.1278 0.1228	0.1253	0.10775
312.5	0.2356 0.2284	0.232	0.21445
625	0.4294 0.4325	0.43095	0.4134
1250	0.7662 0.7712	0.7687	0.75115
2500	1.3675 1.4005	1.384	1.36645
5000	2.2546 2.2745	2.26455	2.247

Standard curve 2



(pg/mL)	O.D.	Average	Corrected
0	0.0574 0.0457	0.05155	-
78.1	0.1013 0.1065	0.1039	0.05235
156.3	0.1448 0.149	0.1469	0.09535
312.5	0.2545 0.2491	0.2518	0.20025
625	0.4393 0.4381	0.4387	0.38715
1250	0.767 0.7972	0.7821	0.73055
2500	1.3647 1.3689	1.3668	1.31525
5000	2.2808 2.2931	2.28695	2.2354

SENSITIVITY

The minimum detectable dose of human CD80/B7-1 is 28.7 pg/mL. This was determined by adding two standard deviations to the concentration corresponding to the mean O.D. of 20 zero standard replicates.

PRECISION

Intra-assay Precision (Precision within an assay) Three samples of known concentration were tested 8 times on one plate to assess intra-assay precision. Inter-assay Precision (Precision between assays) Three samples of known concentration were tested in 16 separate assays to assess inter-assay precision.

Intra-assay Precision

Sample	n	Mean (pg/mL)	SD	CV%
1	8	2,458.7	72.2	2.9
2	8	583.6	15.1	2.6
3	8	281.4	7.0	2.5

Inter-assay Precision

Sample	n	Mean (pg/mL)	SD	CV%
1	16	2,581.8	141.5	5.5
2	16	612.8	33.9	5.5
3	16	288.4	10.7	3.7

RECOVERY

The recovery of human CD80/B7-1 spiked to three different levels throughout the range of the assay in various matrices was evaluated.

Sample Type		Average% of Expected	Range (%)
Human plasma	1:2	78	71-85
	1:4	81	80-83
Cell culture supernatant	1:2	109	107-112
	1:4	103	100-106
Urine	1:2	94	87-98
	1:4	100	95-105
Cell lysate	1:8	72	71-75
	1:16	80	77-82

LINEARITY

To assess the linearity of the assay, cell culture supernatant and urine samples were spiked with high concentrations of human CD80/B7-1 and diluted with the appropriate Sample Diluent to produce samples with values within the dynamic range of the assay. Human plasma and cell lysate samples were diluted with the appropriate Sample Diluent to produce samples with values within the dynamic range of the assay.

		Human plasma (Sample Diluent PT 4B1)	Cell culture supernatant (Sample Diluent PT 4B1)	Urine (Sample Diluent PT 4B1)	Cell lysate (Sample Diluent PT 4B1-ac)
1:2	Average% of Expected	100	118	83	100
	Range (%)	-	112-125	79-87	-
1:4	Average% of Expected	91	113	98	110
	Range (%)	86-96	110-115	95-100	109-111
1:8	Average% of Expected	93	104	105	81
	Range (%)	86-100	103-104	103-107	79-83
1:16	Average% of Expected	91	92	106	76
	Range (%)	83-100	90-93	105-107	75-77

CALIBRATION

This immunoassay is calibrated against a highly purified recombinant **human Human CD80/B7-1 One-Step ELISA Kit** produced at Sunlong Medical™.

SAMPLE VALUES

Human plasma - human plasma samples were evaluated for the presence of human CD80/B7-1 in this assay.

Urine - Eight samples were evaluated for detectable levels of human CD80/B7-1 in this assay. Seven measured less than the lowest human CD80/B7-1 standard,78.1 pg/mL. One sample read 107.2 pg/mL.

Cell culture supernatant - Raji cells (1 x 106 cells/mL) were cultured in DMEM supplemented with 10% fetal bovine serum, 2 mM L-glutamine, 100 U/mL penicillin, 100 µg/mL streptomycin sulfate. An aliquot of the cell culture supernatant was removed, assayed for human CD80/B7-1, and measured 541.3 pg/mL. Cell lysate

Sample Type	Mean (pg/mL)	Range (pg/mL)
Human plasma (n=16)	260.2	178.9-387.2

	Human CD80/B7-1 (pg/mL)	Total protein (mg/mL)
Raji cell lysate	6,976.7	1.2
Daudi cell lysate	1,092.2	1.5

SPECIFICITY

This assay recognizes natural and recombinant human CD80/B7-1. The following factors prepared at 50 ng/mL were assayed and exhibited no cross-reactivity or interference. Recombinant human: CTLA4

PLATE LAYOUT

	1	2	3	4	5	6	7	8	9	10	11	12
A												
B												
C												
D												
E												
F												
G												
H												