



ab205577 – CD137 Mouse SimpleStep ELISA[®] Kit

Instructions for Use

For the quantitative measurement of CD137 in mouse serum, plasma cell culture supernatant, cell and tissue extract samples.

This product is for research use only and is not intended for diagnostic use.

Table of Contents

INTRODUCTION

1. BACKGROUND	2
2. ASSAY SUMMARY	3

GENERAL INFORMATION

3. PRECAUTIONS	4
4. STORAGE AND STABILITY	4
5. MATERIALS SUPPLIED	4
6. MATERIALS REQUIRED, NOT SUPPLIED	4
7. LIMITATIONS	5
8. TECHNICAL HINTS	5

ASSAY PREPARATION

9. REAGENT PREPARATION	7
10. STANDARD PREPARATION	9
11. SAMPLE PREPARATION	11
12. PLATE PREPARATION	14

ASSAY PROCEDURE

13. ASSAY PROCEDURE	15
---------------------	----

DATA ANALYSIS

14. CALCULATIONS	17
15. TYPICAL DATA	18
16. TYPICAL SAMPLE VALUES	20
17. ASSAY SPECIFICITY	24
18. SPECIES REACTIVITY	26

RESOURCES

19. TROUBLESHOOTING	27
20. NOTES	28

1. BACKGROUND

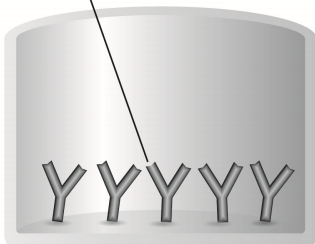
CD137 *in vitro* SimpleStep ELISA® (Enzyme-Linked Immunosorbent Assay) kit is designed for the quantitative measurement of CD137 protein in mouse serum, plasma cell culture supernatant, cell and tissue extract samples.

The SimpleStep ELISA® employs an affinity tag labeled capture antibody and a reporter conjugated detector antibody which immunocapture the sample analyte in solution. This entire complex (capture antibody/analyte/detector antibody) is in turn immobilized via immunoaffinity of an anti-tag antibody coating the well. To perform the assay, samples or standards are added to the wells, followed by the antibody mix. After incubation, the wells are washed to remove unbound material. TMB Development Solution is added and during incubation is catalyzed by HRP, generating blue coloration. This reaction is then stopped by addition of Stop Solution completing any color change from blue to yellow. Signal is generated proportionally to the amount of bound analyte and the intensity is measured at 450 nm. Optionally, instead of the endpoint reading, development of TMB can be recorded kinetically at 600 nm.

CD137 (also known as 4-1BB and TNFRSF9), a member of tumor necrosis factor receptor family, is a plasma membrane receptor for TNFSF9/4-1BBL. CD137 is expressed on the surface of activated T lymphocytes. CD137 is principally a homodimer, but also found as a monomer. CD137 generates either co-stimulatory signals leading to T cell activation and proliferation, or death signals, and may promote tumor rejection *in vivo*. Soluble forms of CD137 exist, these are generated by proteolytic cleavage or alternative splicing. In the years, functional expression of CD137 was noted on several non-T cells including monocytes, neutrophils, macrophages, B cells and natural killer (NK) cells.

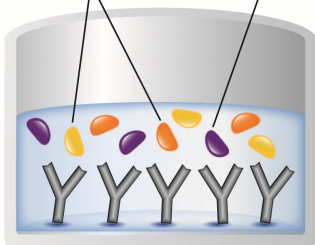
2. ASSAY SUMMARY

Immobilization Antibody



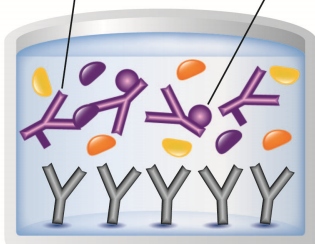
Remove appropriate number of antibody coated well strips. Equilibrate all reagents to room temperature. Prepare all reagents, samples, and standards as instructed.

Matrix Proteins Target Analyte



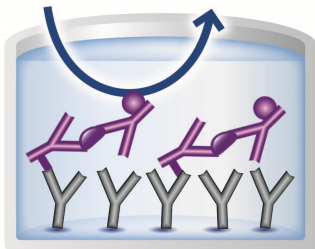
Add standard or sample to appropriate wells.

Capture Antibody Detector Antibody



Add Antibody Cocktail to all wells. Incubate at room temperature.

Substrate Color Development



Aspirate and wash each well. Add TMB Development Solution to each well and incubate. Add Stop Solution at a defined endpoint. Alternatively, record color development kinetically after TMB substrate addition.

3. PRECAUTIONS

Please read these instructions carefully prior to beginning the assay.

All kit components have been formulated and quality control tested to function successfully as a kit. Modifications to the kit components or procedures may result in loss of performance.

4. STORAGE AND STABILITY

Store kit at 2-8°C immediately upon receipt.

Refer to list of materials supplied for storage conditions of individual components. Observe the storage conditions for individual prepared components in the Reagent and Standard Preparation sections.

5. MATERIALS SUPPLIED

Item	Amount	Storage Condition (Before Preparation)
Mouse CD137 Capture Antibody (Lyophilized)	1 Vial	+2-8°C
10X Mouse CD137 Detector Antibody	600 µL	+2-8°C
Mouse CD137 Lyophilized Recombinant Protein	2 Vials	+2-8°C
Antibody Diluent 5BR	6 mL	+2-8°C
10X Wash Buffer PT	20 mL	+2-8°C
5X Cell Extraction Buffer PTR	10 mL	+2-8°C
50X Cell Extraction Enhancer Solution	1 mL	+2-8°C
TMB Development Solution	12 mL	+2-8°C
Stop Solution	12 mL	+2-8°C
Sample Diluent NS	50 mL	+2-8°C
Pre-Coated 96 Well Microplate (12 x 8 well strips)	96 Wells	+2-8°C
Plate Seal	1	+2-8°C

6. MATERIALS REQUIRED, NOT SUPPLIED

These materials are not included in the kit, but will be required to successfully utilize this assay:

- Microplate reader capable of measuring absorbance at 450 or 600 nm.
- Method for determining protein concentration (BCA assay recommended).
- Deionized water.
- PBS (1.4 mM KH₂PO₄, 8 mM Na₂HPO₄, 140 mM NaCl, 2.7 mM KCl, pH 7.4).
- Multi- and single-channel pipettes.
- Tubes for standard dilution.
- Plate shaker for all incubation steps.
- Phenylmethylsulfonyl Fluoride (PMSF) (or other protease inhibitors).

7. LIMITATIONS

- Assay kit intended for research use only. Not for use in diagnostic procedures.
- Do not mix or substitute reagents or materials from other kit lots or vendors. Kits are QC tested as a set of components and performance cannot be guaranteed if utilized separately or substituted.

8. TECHNICAL HINTS

- Samples generating values higher than the highest standard should be further diluted in the appropriate sample dilution buffers.
- Avoid foaming or bubbles when mixing or reconstituting components.
- Avoid cross contamination of samples or reagents by changing tips between sample, standard and reagent additions.

- Ensure plates are properly sealed or covered during incubation steps.
- Complete removal of all solutions and buffers during wash steps is necessary to minimize background.
- As a guide, typical ranges of sample concentration for commonly used sample types are shown below in Sample Preparation (section 11).
- All samples should be mixed thoroughly and gently.
- Avoid multiple freeze/thaw of samples.
- Incubate ELISA plates on a plate shaker during all incubation steps.
- When generating positive control samples, it is advisable to change pipette tips after each step.
- The provided 5X Cell Extraction Buffer contains phosphatase inhibitors and protease inhibitor aprotinin. Additional protease inhibitors can be added if required.
- The provided Antibody Diluents and Sample Diluents contain protease inhibitor aprotinin. Additional protease inhibitors can be added if required.
- The provided 50X Cell Extraction Enhancer Solution may precipitate when stored at + 4°C. To dissolve, warm briefly at + 37°C and mix gently. The 50X Cell Extraction Enhancer Solution can be stored at room temperature to avoid precipitation.
- **To avoid high background always add samples or standards to the well before the addition of the antibody cocktail.**
- **This kit is sold based on number of tests. A ‘test’ simply refers to a single assay well. The number of wells that contain sample, control or standard will vary by product. Review the protocol completely to confirm this kit meets your requirements. Please contact our Technical Support staff with any questions.**

9. REAGENT PREPARATION

- Equilibrate all reagents to room temperature (18-25°C) prior to use. The kit contains enough reagents for 96 wells. **The sample volumes below are sufficient for 48 wells (6 x 8-well strips); adjust volumes as needed for the number of strips in your experiment.**
- Prepare only as much reagent as is needed on the day of the experiment. Capture and Detector Antibodies have only been tested for stability in the provided 10X formulations.

9.1 **1X Cell Extraction Buffer PTR (For cell and tissue extracts only)**

If required, prepare 1X Cell Extraction Buffer PTR by diluting 5X Cell Extraction Buffer PTR and 50X Cell Extraction Enhancer Solution to 1X with deionized water. To make 10 mL 1X Cell Extraction Buffer PTR combine 7.8 mL deionized water, 2 mL 5X Cell Extraction Buffer PTR and 200 μ L 50X Cell Extraction Enhancer Solution. Mix thoroughly and gently. If required protease inhibitors can be added.

Alternative – Enhancer may be added to 1X Cell Extraction Buffer PTR after extraction of cells or tissue. Refer to note in the Troubleshooting section.

9.2 **1X Wash Buffer PT**

Prepare 1X Wash Buffer PT by diluting 10X Wash Buffer PT with deionized water. To make 50 mL 1X Wash Buffer PT combine 5 mL 10X Wash Buffer PT with 45 mL deionized water. Mix thoroughly and gently.

9.3 **10X Capture Antibody**

To reconstitute the lyophilized capture antibody, centrifuge the CD137 Capture Antibody (Lyophilized) at 10,000 g for 2 minutes.

If the reconstituted antibody will be used within a month, add 330 μ L water and 330 μ L Sample Diluent NS, incubate at room temperature for 3 minutes and re-suspend well by pipetting. Store the unused 10X Reconstituted Capture Antibody at 4°C.

For extended storage, add 330 μ L water to the lyophilized capture antibody, incubate at room temperature for 3 minutes and re-suspend well by pipetting. Then add 330 μ L of 100% glycerol and re-suspend well by pipetting. Store the unused 10X Reconstituted Capture Antibody at -20°C.

9.4 **Antibody Cocktail**

Prepare Antibody Cocktail by diluting the capture and detector antibodies in Antibody Diluent 5BR. To make 3 mL of the Antibody Cocktail combine 300 μ L 10X Capture Antibody and 300 μ L 10X Detector Antibody with 2.4 mL Antibody Diluent 5BR. Mix thoroughly and gently.

10. STANDARD PREPARATION

Prepare serially diluted standards immediately prior to use. Always prepare a fresh set of positive controls for every use.

The following section describes the preparation of a standard curve for duplicate measurements (recommended).

IMPORTANT: If the protein standard vial has a volume identified on the label, reconstitute the CD137 standard by adding that volume of Diluent indicated on the label. Alternatively, if the vial has a mass identified, reconstitute the CD137 standard by adding 500 μ L Diluent. Hold at room temperature for 10 minutes and mix gently. This is the 8,000 pg/mL **Stock Standard** Solution.

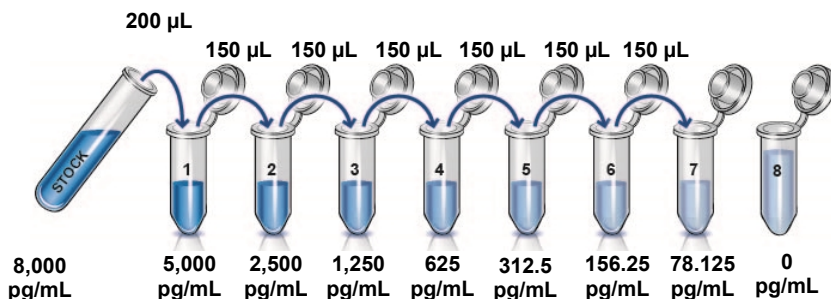
10.1 For **cell culture supernatant, serum and plasma** samples follow to prepare the standard.

10.1.1 Reconstitute the CD137 standard by adding Sample Diluent NS by pipette.

10.1.2 Label eight tubes, Standards 1–8.

10.1.3 Add 120 μ L of Sample Diluent NS into tube number 1 and 150 μ L of Sample Diluent NS into numbers 2–8.

10.1.4 Use the Stock Standard to prepare the following dilution series. Standard #8 contains no protein and is the Blank control:



ASSAY PREPARATION

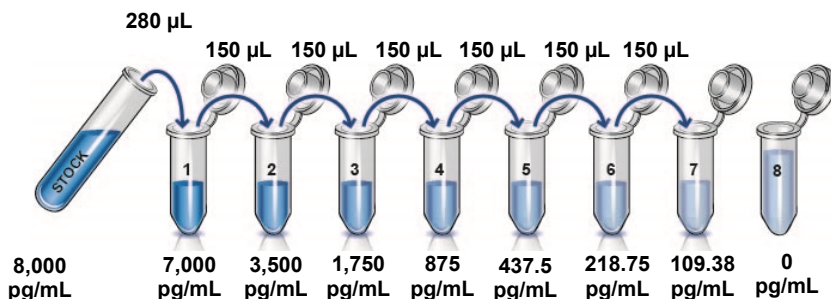
10.2 For **cell and tissue extract** samples follow this section to prepare the standard.

10.2.1 Reconstitute the CD137 standard by adding 1X Cell Extraction Buffer PTR by pipette.

10.2.2 Label eight tubes, Standards 1– 8.

10.2.3 Add 40 μL of 1X Cell Extraction Buffer PTR into tube number 1 and 150 μL of 1X Cell Extraction Buffer PTR into numbers 2-8.

10.2.4 Use the Stock Standard to prepare the following dilution series. Standard #8 contains no protein and is the Blank control:



11. SAMPLE PREPARATION

TYPICAL SAMPLE DYNAMIC RANGE	
Sample Type	Range
Mouse Serum	0.6 -20%
Mouse Plasma - Citrate	0.6 -20%
Mouse Plasma - EDTA	0.6 -20%
Supernatant of EL4.IL2 cells treated with 1.5% PHA and 10 ng/mL PMA for 48 hours	12.5 % - Neat
Supernatant of mouse spleen cells treated with 5 µg/mL LPS for 6 days	0.4 – 25%
Supernatant of D10.G4.1 cells cultured for 3 days	3 - 50%
Supernatant of Raw 264.7 cells cultured for 3 days	0.16 – 10%
Raw 264.7 cell extract	1.6 – 100 µg/mL

11.1 Plasma

Collect plasma using citrate or EDTA. Centrifuge samples at 2,000 x g for 10 minutes. Dilute samples at least 5 X into Sample Diluent NS and assay. Store un-diluted plasma samples at -20°C or below for up to 3 months. Avoid repeated freeze-thaw cycles.

11.2 Serum

Samples should be collected into a serum separator tube. After clot formation, centrifuge samples at 2,000 x g for 10 minutes and collect serum. Dilute samples at least 5 X into Sample Diluent NS and assay. Store un-diluted serum at -20°C or below. Avoid repeated freeze-thaw cycles.

11.3 Cell Culture Supernatants

Centrifuge cell culture media at 2,000 x g for 10 minutes to remove debris. Collect supernatants. Cell culture supernatant samples can be assayed without dilution. If needed, dilute cell culture supernatant samples in Sample Diluent NS and assay. Store samples at -20°C or below. Avoid repeated freeze-thaw cycles.

11.4 Preparation of extracts from cell pellets

11.4.1 Collect non-adherent cells by centrifugation or scrape to collect adherent cells from the culture flask. Typical centrifugation conditions for cells are 500 x g for 5 minutes at 4°C.

11.4.2 Rinse cells twice with PBS.

11.4.3 Solubilize pellet at 2×10^7 cell/mL in chilled 1X Cell Extraction Buffer PTR.

11.4.4 Incubate on ice for 20 minutes.

11.4.5 Centrifuge at 18,000 x g for 20 minutes at 4°C.

11.4.6 Transfer the supernatants into clean tubes and discard the pellets.

11.4.7 Assay samples immediately or aliquot and store at -80°C. The sample protein concentration in the extract may be quantified using a protein assay.

11.4.8 Dilute samples to desired concentration in 1X Cell Extraction Buffer PTR.

11.5 Preparation of extracts from adherent cells by direct lysis (alternative protocol)

11.5.1 Remove growth media and rinse adherent cells 2 times in PBS.

11.5.2 Solubilize the cells by addition of chilled 1X Cell Extraction Buffer PTR directly to the plate (use 750 µL - 1.5 mL 1X Cell Extraction Buffer PTR per confluent 15 cm diameter plate).

- 11.5.3 Scrape the cells into a microfuge tube and incubate the lysate on ice for 15 minutes.
 - 11.5.4 Centrifuge at 18,000 x g for 20 minutes at 4°C.
 - 11.5.5 Transfer the supernatants into clean tubes and discard the pellets.
 - 11.5.6 Assay samples immediately or aliquot and store at -80°C. The sample protein concentration in the extract may be quantified using a protein assay.
 - 11.5.7 Dilute samples to desired concentration in 1X Cell Extraction Buffer PTR.
- 11.6 Preparation of extracts from tissue homogenates**
- 11.6.1 Tissue lysates are typically prepared by homogenization of tissue that is first minced and thoroughly rinsed in PBS to remove blood (dounce homogenizer recommended).
 - 11.6.2 Homogenize 100 to 200 mg of wet tissue in 500 µL – 1 mL of chilled 1X Cell Extraction Buffer PTR. For lower amounts of tissue adjust volumes accordingly.
 - 11.6.3 Incubate on ice for 20 minutes.
 - 11.6.4 Centrifuge at 18,000 x g for 20 minutes at 4°C.
 - 11.6.5 Transfer the supernatants into clean tubes and discard the pellets.
 - 11.6.6 Assay samples immediately or aliquot and store at -80°C. The sample protein concentration in the extract may be quantified using a protein assay.
 - 11.6.7 Dilute samples to desired concentration in 1X Cell Extraction Buffer PTR.

12. PLATE PREPARATION

- The 96 well plate strips included with this kit are supplied ready to use. It is not necessary to rinse the plate prior to adding reagents.
- Unused plate strips should be immediately returned to the foil pouch containing the desiccant pack, resealed and stored at 4°C.
- For each assay performed, a minimum of two wells must be used as the zero control.
- For statistical reasons, we recommend each sample should be assayed with a minimum of two replicates (duplicates).
- Differences in well absorbance or “edge effects” have not been observed with this assay.

13. ASSAY PROCEDURE

- **Equilibrate all materials and prepared reagents to room temperature prior to use.**
- **It is recommended to assay all standards, controls and samples in duplicate.**

- 13.1 Prepare all reagents, working standards, and samples as directed in the previous sections.
- 13.2 Remove excess microplate strips from the plate frame, return them to the foil pouch containing the desiccant pack, reseal and return to 4°C storage.
- 13.3 Add 50 µL of all sample or standard to appropriate wells.
- 13.4 Add 50 µL of the Antibody Cocktail to each well.
- 13.5 Seal the plate and incubate for 1 hour at room temperature on a plate shaker set to 400 rpm.
- 13.6 Wash each well with 3 x 350 µL 1X Wash Buffer PT. Wash by aspirating or decanting from wells then dispensing 350 µL 1X Wash Buffer PT into each well. Complete removal of liquid at each step is essential for good performance. After the last wash invert the plate and blot it against clean paper towels to remove excess liquid.
- 13.7 Add 100 µL of TMB Development Solution to each well and incubate for 10 minutes in the dark on a plate shaker set to 400 rpm.

Given variability in laboratory environmental conditions, optimal incubation time may vary between 5 and 20 minutes.

Note: *The addition of Stop Solution will change the color from blue to yellow and enhance the signal intensity about 3X. To avoid signal saturation, proceed to the next step before the high concentration of the standard reaches a blue color of O.D.600 equal to 1.0.*

- 13.8 Add 100 µL of Stop Solution to each well. Shake plate on a plate shaker for 1 minute to mix. Record the OD at 450 nm. This is an endpoint reading.

Alternative to 13.7 – 13.8: Instead of the endpoint reading at 450 nm, record the development of TMB Substrate kinetically. Immediately after addition of TMB Development Solution begin recording the blue color development with elapsed time in the microplate reader prepared with the following settings:

Mode:	Kinetic
Wavelength:	600 nm
Time:	up to 20s min
Interval:	20 sec - 1 min
Shaking:	Shake between readings

Note that an endpoint reading can also be recorded at the completion of the kinetic read by adding 100 μ L Stop Solution to each well and recording the OD at 450 nm.

13.9 Analyze the data as described below.

14. CALCULATIONS

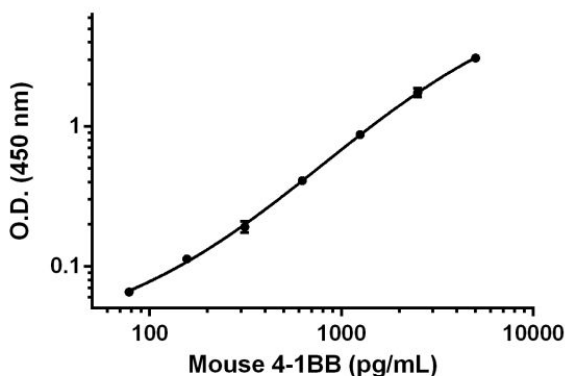
- 14.1 Calculate the average absorbance value for the blank control (zero) standards. Subtract the average blank control standard absorbance value from all other absorbance values.
- 14.2 Create a standard curve by plotting the average blank control subtracted absorbance value for each standard concentration (y-axis) against the target protein concentration (x-axis) of the standard. Use graphing software to draw the best smooth curve through these points to construct the standard curve.

Note: Most microplate reader software or graphing software will plot these values and fit a curve to the data. A four parameter curve fit (4PL) is often the best choice; however, other algorithms (e.g. linear, semi-log, log/log, 4 parameter logistic) can also be tested to determine if it provides a better curve fit to the standard values.

- 14.3 Determine the concentration of the target protein in the sample by interpolating the blank control subtracted absorbance values against the standard curve. Multiply the resulting value by the appropriate sample dilution factor, if used, to obtain the concentration of target protein in the sample.
- 14.4 Samples generating absorbance values greater than that of the highest standard should be further diluted and reanalyzed. Similarly, samples which measure at an absorbance values less than that of the lowest standard should be retested in a less dilute form.

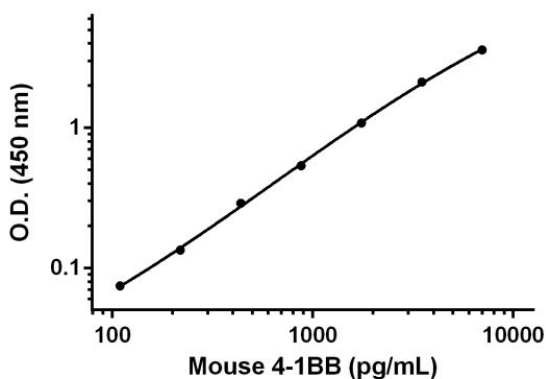
15. TYPICAL DATA

TYPICAL STANDARD CURVE – Data provided for **demonstration purposes only**. A new standard curve must be generated for each assay performed.



Standard Curve Measurements			
Conc. (pg/mL)	O.D. 450 nm		Mean O.D.
	1	2	
0	0.060	0.059	0.060
78.12	0.128	0.122	0.126
156.25	0.171	0.174	0.173
312.5	0.264	0.239	0.252
625	0.477	0.462	0.470
1,250	0.926	0.939	0.933
2,500	1.719	1.904	1.812
5,000	3.211	3.091	3.151

Figure 1. Example of CD137 standard curve in Sample Diluent NS. The CD137 standard curve was prepared as described in Section 10. Raw data values are shown in the table. Background-subtracted data values (mean +/- SD) are graphed.



Standard Curve Measurements			
Conc. (pg/mL)	O.D. 450 nm		Mean O.D.
	1	2	
0	0.069	0.077	0.073
109.37	0.148	0.147	0.148
218.75	0.210	0.205	0.208
437.5	0.366	0.358	0.363
875	0.613	0.605	0.610
1,750	1.148	1.161	1.155
3,500	2.210	2.170	2.191
7,000	3.588	3.756	3.673

Figure 2. Example of CD137 standard curve in 1X Cell Extraction Buffer PTR. The CD137 standard curve was prepared as described in Section 10. Raw data values are shown in the table. Background-subtracted data values (mean $\pm$ SD) are graphed.

16. TYPICAL SAMPLE VALUES

SENSITIVITY –

The calculated minimal detectable dose (MDD) is determined by calculating the mean of zero standard replicates and adding 2 standard deviations then extrapolating the corresponding concentration. The MDD is dependent on the Sample Diluent buffer used:

Sample Diluent Buffer	n=	Minimal Detectable Dose
Sample Diluent NS	25	14 pg/mL
1X Cell Extraction Buffer PTR	26	48 pg/mL

RECOVERY –

For **cell culture supernatant, serum and plasma samples** measurements, three concentrations of mouse recombinant CD137 were spiked in duplicate to the indicated biological matrix to evaluate signal recovery in the working range of the assay.

Sample Type	Average % Recovery	Range (%)
100% Cell Culture Media	94.5	88.4 – 103.7
10% Mouse Serum	108.8	99.9 – 114.3
5% Mouse Plasma - Citrate	120.5	116.6 – 124.1
5% Mouse Plasma – EDTA	106.3	103.5 – 110.1

For **cell and tissue extract samples** measurements, three concentrations of mouse recombinant CD137 were spiked in duplicate to the indicated biological matrix to evaluate signal recovery in the working range of the assay.

Sample Type	Average % Recovery	Range (%)
50% Cell Culture Media	115.6	112.7 – 121.2
10% Human Serum	114.5	111.9 – 118.8

LINEARITY OF DILUTION –

Linearity of dilution is determined based on interpolated values from the standard curve. Linearity of dilution defines a sample concentration interval in which interpolated target concentrations are directly proportional to sample dilution.

Native CD137 was measured in the following biological samples in a 2-fold dilution series. Cell culture supernatant, serum and plasma samples dilutions were made in Sample Diluent NS. Cell extract samples dilutions were made in 1X Cell Extraction Buffer PTR.

Dilution Factor	Interpolated value	10% Raw 264.7 Cell Supern.	100 µg/mL Raw 264.7 Cell Extract	20% Mouse Serum	20% Mouse Plasma (Citrate)	20% Mouse Plasma (EDTA)
Undiluted	pg/mL	5,714	6,259.5	3,487.1	5,514.1	4,896.8
	% Expected value	100	100	100	100	100
2	pg/mL	3,058.8	3,106.7	1,574.4	2,733.5	2,155
	% Expected value	107.1	99.3	90.3	99.1	88
4	pg/mL	1,507.9	1,497.3	786.5	1,327.9	1,116.1
	% Expected value	105.6	95.7	90.2	96.3	91.2
8	pg/mL	727.1	800.1	405	620.5	560.8
	% Expected value	101.8	102.3	92.9	90	91.6
16	pg/mL	366.6	408.7	193.6	311.1	256.2
	% Expected value	102.7	104.5	88.8	90.3	83.7
32	pg/mL	180.6	208.2	94.8	139.5	115.2
	% Expected value	101.1	106.4	87.0	80.9	81.2
64	pg/mL	92.9	100	43.6	NA	NA
	% Expected value	104.1	102.2	79.9	NA	NA

NA – Not Analyzed, measured O.D. values were lower than the O.D. value of the lowest standard

Dilution Factor	Interpolated value	100 µg/mL Raw 264.7 Cell Extract
Undiluted	pg/mL	6,259.5
	% Expected value	100
2	pg/mL	3,106.7
	% Expected value	99.3
4	pg/mL	1,497.3
	% Expected value	95.7
8	pg/mL	800.1
	% Expected value	102.3
16	pg/mL	408.7
	% Expected value	104.5
32	pg/mL	208.2
	% Expected value	106.4
64	pg/mL	100
	% Expected value	102.2

PRECISION –

Mean coefficient of variations of interpolated values from 3 concentrations of Raw 264.7 cell culture supernatant samples within the working range of the assay.

	Intra-Assay	Inter-Assay
n=	5	3
CV (%)	3.9	4.8

Serum/Plasma. Pooled female mouse serum and plasma samples were measured in three different dilutions in duplicates for CD137 concentrations using this kit. Means of interpolated sample values adjusted to sample dilution are shown in pg of CD137 per mL of serum/plasma in the table below.

Sample Type	Mean (pg/mL)	Range (pg/mL)
Mouse Serum	16,303	15,730 – 17,435
Mouse Plasma - Citrate	27,154	26,558 – 27,571
Mouse Plasma - EDTA	22,785	21,550 – 24,484

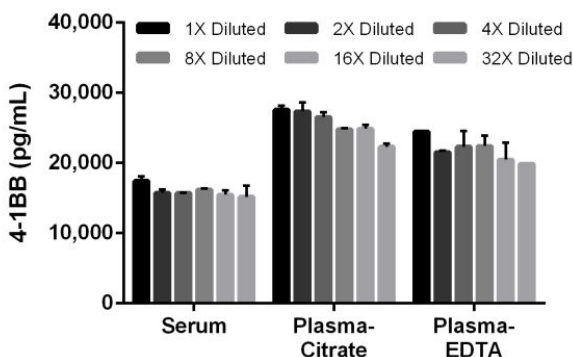


Figure 3. Interpolated concentrations of CD137 in mouse serum, plasma and cell culture supernatant samples. The concentrations of CD137 were measured in duplicates, interpolated from the CD137 standard curves and corrected for sample dilution. Note that 1X Diluted serum and plasma samples were pre-diluted to 20%. Note that 1X Diluted Raw 264.7 day 3 cell culture supernatant samples were pre-diluted to 10%. The interpolated, dilution factor-corrected values are plotted in pg of CD137 per mL of neat sample (mean $\pm$ SD, n=2).

17. ASSAY SPECIFICITY

This kit recognizes both native and recombinant mouse CD137 protein in serum, plasma (citrate and EDTA), cell culture supernatant, and cell and tissue extract samples only.

This kit is not compatible with plasma (Heprarin) samples.

Urine, milk, saliva samples have not been tested with this kit.

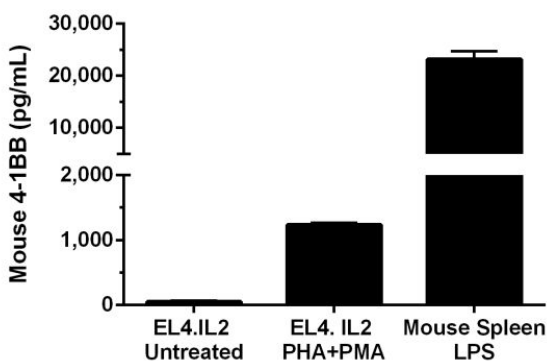


Figure 4. Concentrations of CD137 in various untreated and treated cell culture supernatant samples. EL4.IL2 cells were serum starved for 24 hours and then cultured in the absence or presence of 1.5% PHA and 10 ng/mL PMA for 48 hours. Mouse spleen cells were cultured in the presence of 5 μ g/mL LPS for 6 days. The cell culture supernatants were prepared. The concentrations of CD137 were measured in the diluted cell culture supernatant samples in duplicates, interpolated from the CD137 standard curve and corrected for sample dilution. Note that EL4.IL2 cell culture supernatant samples were analyzed neat, 2X and 4X diluted. Note that mouse spleen cell culture supernatant samples were analyzed 4X, 8X and 16X diluted. The interpolated, dilution factor-corrected values are plotted in pg of CD137 per mL of neat supernatant (mean $\pm$ SD, n=3).

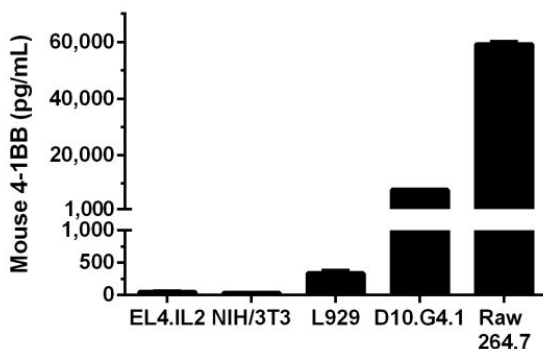


Figure 5. Concentrations of CD137 in various cell culture supernatant samples. EL4.IL2 cells were cultured in the absence of serum for 3 days. NIH3T3, L929, D10G4.1 and Raw 264.7 cells were cultured in the presence of serum for 3 days. The cell culture supernatants were prepared. The concentrations of CD137 were measured in the diluted cell culture supernatant samples in duplicates, interpolated from the CD137 standard curve and corrected for sample dilution. Note that EL4.IL2 cell culture supernatant samples were analyzed neat and 2X diluted. Note that NIH/3T3 cell culture supernatant samples were analyzed neat. Note that L929 cell culture supernatant samples were analyzed neat, 2X and 4X diluted. Note that D10G4.1 cell culture supernatant samples were analyzed 2X, 4X and 8X diluted. Note that Raw 264.7 cell culture supernatant samples were analyzed 10X, 20X and 40X diluted. The interpolated, dilution factor-corrected values are plotted in pg of CD137 per mL of neat supernatant (mean $\pm$ SD, $n=1-3$).

18. SPECIES REACTIVITY

This kit recognizes mouse CD137 protein.

Other species reactivity was determined by measuring 3X diluted serum samples of various species, interpolating the protein concentrations from the mouse standard curve, and expressing the interpolated concentrations as a percentage of the protein concentration in mouse serum assayed at the same dilution.

Reactivity < 3% was determined for the following species:

- Rat
- Hamster
- Guinea Pig
- Rabbit
- Dog
- Goat
- Pig
- Cow
- Human

Please contact our Technical Support team for more information

19. TROUBLESHOOTING

Problem	Cause	Solution
Difficulty pipetting lysate; viscous lysate.	Genomic DNA solubilized	Prepare 1X Cell Extraction Buffer PTR (without enhancer). Add enhancer to lysate after extraction.
Poor standard curve	Inaccurate Pipetting	Check pipettes
	Improper standard dilution	Prior to opening, briefly spin the stock standard tube and dissolve the powder thoroughly by gentle mixing
Low Signal	Incubation times too brief	Ensure sufficient incubation times; increase to 2 or 3 hour standard/sample incubation
	Inadequate reagent volumes or improper dilution	Check pipettes and ensure correct preparation
	Incubation times with TMB too brief	Ensure sufficient incubation time until blue color develops prior addition of Stop solution
Large CV	Plate is insufficiently washed	Review manual for proper wash technique. If using a plate washer, check all ports for obstructions.
	Contaminated wash buffer	Prepare fresh wash buffer
Low sensitivity	Improper storage of the ELISA kit	Store your reconstituted standards at -80°C, all other assay components 4°C. Keep TMB Development Solution protected from light.
Precipitate in Diluent	Precipitation and/or coagulation of components within the Diluent.	Precipitate can be removed by gently warming the Diluent to 37°C.

20. NOTES

Technical Support

Copyright © 2021 Abcam, All Rights Reserved. The Abcam logo is a registered trademark. All information / detail is correct at time of going to print.

For all technical or commercial enquiries please go to:

www.abcam.com/contactus

www.abcam.cn/contactus (China)

www.abcam.co.jp/contactus (Japan)