

# **ab100705 – IL-1 beta Mouse ELISA Kit**

## **Instructions for Use**

For the quantitative measurement of mouse IL-1 beta in cell lysates and tissue lysates.

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	5
6. MATERIALS REQUIRED, NOT SUPPLIED	6
7. LIMITATIONS	6
8. TECHNICAL HINTS	7

## ASSAY PREPARATION

9. REAGENT PREPARATION	8
10. STANDARD PREPARATIONS	9
11. SAMPLE PREPARATION	11
12. PLATE PREPARATION	12

## ASSAY PROCEDURE

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

## DATA ANALYSIS

14. CALCULATIONS	14
15. TYPICAL DATA	15
16. TYPICAL SAMPLE VALUES	16
17. ASSAY SPECIFICITY	16

## RESOURCES

18. TROUBLESHOOTING	18
19. NOTES	19

## 1. BACKGROUND

Abcam's IL-1 beta Mouse ELISA (Enzyme-Linked Immunosorbent Assay) kit is an *in vitro* enzyme-linked immunosorbent assay for the quantitative measurement of mouse IL-1 beta in cell lysates and tissue lysates.

This assay employs an antibody specific for mouse IL-1 beta coated on a 96-well plate. Standards and samples are pipetted into the wells and IL-1 beta present in a sample is bound to the wells by the immobilized antibody. The wells are washed and biotinylated anti-mouse IL-1 beta antibody is added. After washing away unbound biotinylated antibody, HRP conjugated streptavidin is pipetted to the wells. The wells are again washed, a TMB substrate solution is added to the wells and color develops in proportion to the amount of IL-1 beta bound. The Stop Solution changes the color from blue to yellow, and the intensity of the color is measured at 450 nm.

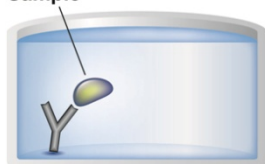
## 2. ASSAY SUMMARY

**Primary Capture Antibody**



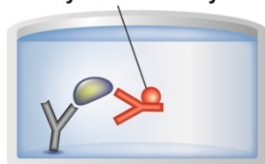
Prepare all reagents, samples and standards as instructed.

**Sample**



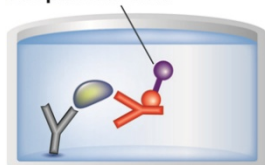
Add standard or sample to each well used. Incubate at room temperature

**Biotinylated Antibody**



Add prepared biotin antibody to each well. Incubate at room temperature.

**Streptavidin-HRP**



Add prepared Streptavidin solution. Incubate at room temperature.

**Substrate      Colored Product**



Add TMB One-Step Development Solution to each well. Incubate at room temperature. Add Stop Solution to each well. Read at 450nm immediately.

### **3. PRECAUTIONS**

**Please read these instructions carefully prior to beginning the assay.**

Modifications to the kit components or procedures may result in loss of performance.

### **4. STORAGE AND STABILITY**

**Store kit at -20°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 section 9. Reagent Preparation.

## 5. MATERIALS SUPPLIED

The entire kit may be stored at -20°C for up to 1 year from the date of shipment. Avoid repeated freeze-thaw cycles. The kit may be stored at 4°C for up to 6 months. For extended storage, it is recommended to store at -80°C.

Item	Amount	Storage Condition (Before Preparation)	Storage Condition (After Preparation)
IL-1 beta Microplate (12 x 8 wells)	96 wells	-20°C	1 month at 4°C*
20X Wash Buffer Concentrate	25 mL	-20°C	1 month at 4°C
Recombinant Mouse IL-1 beta Standard	2 vials	-20°C	1 week at -80°C
5X Sample Diluent Buffer	10 mL	-20°C	1 month at 4°C
5X Assay Diluent	15 mL	-20°C	1 month at 4°C
Biotinylated anti-mouse IL-1 beta	2 vials	-20°C	5 days at 4°C
200X HRP-Streptavidin Concentrate	200 µL	-20°C	Do not store and reuse
TMB One-Step Substrate Reagent	12 mL	-20°C	N/A
Stop Solution	8 mL	-20°C	N/A
2X Cell Lysate Buffer	5 mL	-20°C	1 month at 4°C

\*Return unused wells to the pouch containing desiccant pack, reseal along entire edge.

### **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 nm.
- Precision pipettes to deliver 2  $\mu$ L to 1 mL volumes.
- Adjustable 1-25 mL pipettes for reagent preparation.
- 100 mL and 1 liter graduated cylinders.
- Absorbent paper.
- Distilled or deionized water.
- Log-log graph paper or computer and software for ELISA data analysis.
- Tubes to prepare standard or sample dilutions.

### **7. LIMITATIONS**

- Do not mix or substitute reagents or materials from other kit lots or vendors.

### 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.
- When preparing your standards, it is very critical to briefly spin down the vial first. The powder may drop off from the cap when opening it if you do not spin down. Be sure to dissolve the powder thoroughly when reconstituting. After adding Assay Diluent to the vial, we recommend inverting the tube a few times, then flick the tube a few times, and then spin it down; repeat this procedure 3-4 times. This is a technique we find very effective for thoroughly mixing the standard without too much mechanical force.
- Do not vortex the standard during reconstitution, as this will destabilize the protein.
- Once your standard has been reconstituted, it should be used right away or else frozen for later use.
- Keep the standard dilutions on ice while during preparation, but the ELISA procedure should be done at room temperature.
- Be sure to discard the working standard dilutions after use – they do not store well.
- **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.

### 9.1 1X Sample Diluent Buffer

5X Sample Diluent Buffer should be diluted 5-fold with deionized or distilled water before use.

### 9.2 1X Assay Diluent

5X Assay Diluent should be diluted 5-fold with deionized or distilled water before use.

### 9.3 1X Cell Lysate Buffer

2X Cell Lysate Buffer should be diluted 2-fold with deionized or distilled water (for cell lysate and tissue lysate).

### 9.4 1X Wash Solution

If the 20X Wash Concentrate contains visible crystals, equilibrate to room temperature and mix gently until dissolved. Dilute 20 mL of 20X Wash Buffer Concentrate into deionized or distilled water to yield 400 mL of 1X Wash Buffer.

### 9.5 1X Biotinylated IL-1 beta Detection Antibody

Briefly spin the Biotinylated anti-mouse IL-1 beta vial before use. Add 100 µL of 1X Assay Diluent into the vial to prepare a detection antibody concentrate. Pipette up and down to mix gently (the concentrate can either be stored at 4°C for 5 days or aliquoted and frozen at -20°C for 2 months). The detection antibody concentrate must be diluted 80-fold with 1X Assay Diluent prior to use in the Assay Procedure.

## 9.6 1X HRP-Streptavidin Solution

Briefly spin the 200X HRP-Streptavidin concentrate vial and pipette up and down to mix gently before use. HRP-Streptavidin concentrate must be diluted 200-fold with 1X Assay Diluent prior to use in the Assay Procedure.

For example: Briefly spin the vial and pipette up and down to mix gently. Add 50  $\mu$ L of 200X HRP-Streptavidin concentrate into a tube with 10 mL 1X Assay Diluent to prepare a final 200 fold diluted 1X HRP-Streptavidin solution (don't store the diluted solution for next day use). Mix well.

## 10. STANDARD PREPARATIONS

- Prepare serially diluted standards immediately prior to use. Always prepare a fresh set of standards for every use.
- Standard (recombinant protein) should be stored at -20°C or -80°C (recommended at -80°C) after reconstitution.

10.1 Briefly spin the vial of IL-1 beta Standard. Prepare the 50 ng/mL **Stock Standard** by adding 400  $\mu$ L 1X Sample Diluent Buffer into the vial (see table below).

10.2 Ensure the powder is thoroughly dissolved by gentle mixing.

10.3 Label tubes #1-7.

10.4 Prepare **Standard #1** by adding 40  $\mu$ L of the 50 ng/mL **Stock Standard**, to 960  $\mu$ L of Sample Diluent Buffer into tube 1#, to obtain a 2,000 pg/ml solution. Mix thoroughly and gently.

10.5 Pipette 400  $\mu$ L of 1X Sample Diluent Buffer into remaining tubes.

10.6 Prepare **Standard #2** by adding 200  $\mu$ L Standard #1 to tube #2 and mix thoroughly.

10.7 Prepare **Standard #3** by adding 200  $\mu$ L Standard #2 to tube #3 and mix thoroughly.

## ASSAY PREPARATION

10.8 Using the table below as a guide, prepare further serial dilutions.

10.9 1X Sample Diluent Buffer serves as the zero standard (0 pg/mL).

**Standard Dilution Preparation Table**

Standard #	Volume to Dilute (μL)	Diluent (μL)	Total Volume (μL)	Starting Conc. (pg/mL)	Final Conc. (pg/mL)
1	40	960	1,000	50,000	2,000
2	200	400	600	2,000	666.7
3	200	400	600	666.7	222.2
4	200	400	600	222.2	74.07
5	200	400	600	74.07	24.69
6	200	400	600	24.69	8.23
7	200	400	600	8.23	2.74
8	0	400	400	0	0



## 11. SAMPLE PREPARATION

Cell or tissue lysates are prepared by homogenization of cell or tissue samples in Cell Lysate Buffer. Adding protease inhibitors to the Cell Lysate Buffer prior to homogenization is strongly recommended. Since susceptibility to proteolytic cleavage and the type of proteases present in the lysate vary, a specific product is not recommended. Instead, choice of which combination of protease inhibitors to use should be based upon a literature search for the protein(s) of interest and/or tissue or cell type.

1. Choices of the method for lysis and homogenization include glass-bead “smash,” douncing, freeze thaw, sonication and crushing frozen tissue with a mortar and pestle, or even a combination of these. There is no best method for all sample types; the choice of method should be made following a brief search of the literature to see how similar samples have been prepared in previous investigations. Since different cells and tissues may contain different amounts of protein, as starting point, we suggest using 500  $\mu\text{L}$  of Cell Lysate Buffer per  $1 \times 10^6$  cells or 10 mg tissue.
2. After homogenization, centrifuge the lysates to remove cell/tissue debris (5 min @ 10,000 x g or 10 min @ 5,000 x g) and save the supernatant. Unless testing fresh, lysates should be frozen as soon as possible and stored at  $-20^{\circ}\text{C}$  (or  $-80^{\circ}\text{C}$ , if possible). Centrifuge them again before incubating with any immunoassay. Next, determine the protein concentration of the lysates using a total protein assay and normalize the volume of each sample used to deliver the same amount of total protein for each assay.

**Note:** *The Bradford assay is not recommended as it can be inhibited by the presence of detergents.*

3. The target total protein concentration of the homogenate should be at least 1,000  $\mu\text{g/mL}$ , but 2,000  $\mu\text{g/mL}$  or more would be better. Tissue lysate and cell lysate samples should be diluted at least 5-fold with 1X Sample Diluent Buffer. This may be adjusted based on results.

## 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 well strips should be returned to the plate packet and stored at 4°C.
- For statistical reasons, we recommend each sample should be assayed with a minimum of two replicates (duplicates).
- Well effects have not been observed with this assay. Contents of each well can be recorded on the template sheet included in the Resources section.

## **13. ASSAY PROCEDURE**

- **Equilibrate all materials and prepared reagents to room temperature (18 - 25°C) prior to use.**
- **It is recommended to assay all standards, controls and samples in duplicate.**

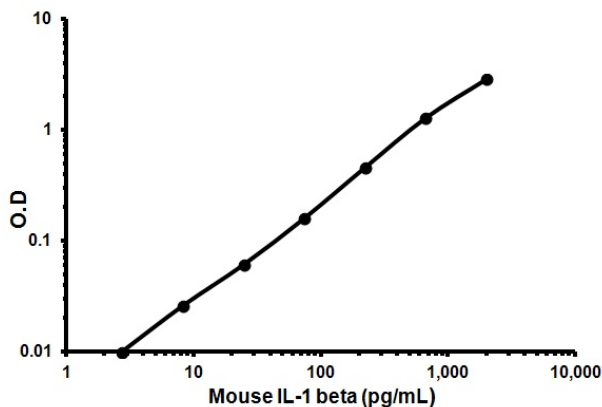
- 13.1. Add 100  $\mu$ L of each standard (see Standard Preparation section 10) and sample into appropriate wells. Cover well and incubate for 2.5 hours at room temperature or over night at 4°C with gentle shaking.
- 13.2. Discard the solution and wash 4 times with 1X Wash Solution. Wash by filling each well with 1X Wash Solution (300  $\mu$ L) using a multi-channel Pipette or auto washer. Complete removal of liquid at each step is essential to good performance. After the last wash, remove any remaining Wash Buffer by aspirating or decanting. Invert the plate and blot it against clean paper towels.
- 13.3. Add 100  $\mu$ L of 1X Biotinylated IL-1 beta Detection Antibody (Reagent Preparation, section 9.3) to each well. Incubate for 1 hour at room temperature with gentle shaking.
- 13.4. Discard the solution. Repeat the wash as in step 13.2.
- 13.5. Add 100  $\mu$ L of 1X HRP-Streptavidin solution (see Reagent Preparation section 9.4) to each well. Incubate for 45 minutes at room temperature with gentle shaking.
- 13.6. Discard the solution. Repeat the wash as in step 13.2.
- 13.7. Add 100  $\mu$ L of TMB One-Step Substrate Reagent to each well. Incubate for 30 minutes at room temperature in the dark with gentle shaking.
- 13.8. Add 50  $\mu$ L of Stop Solution to each well. Read at 450 nm immediately.

### **14. CALCULATIONS**

Calculate the mean absorbance for each set of duplicate standards, controls and samples, and subtract the average zero standard optical density. Plot the standard curve on log-log graph paper, with standard concentration on the x-axis and absorbance on the y-axis. Draw the best-fit straight line through the standard points.

## 15. TYPICAL DATA

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



Conc. (pg/mL)	O.D.
2.74	0.010
8.23	0.026
24.69	0.061
74.07	0.160
222.22	0.460
666.67	1.290
2,000	2.887



## 16. TYPICAL SAMPLE VALUES

### SENSITIVITY –

The minimum detectable dose of IL-1 beta is typically less than 5 pg/mL.

### RECOVERY –

Recovery was determined by spiking various levels of mouse IL-1 beta into mouse tissue lysate and cell lysate. Mean recoveries are as follows:

Sample Type	Average % Recovery	Range (%)
Tissue Lysate	98.26	89-109
Cell Lysate	102.34	90-111

### LINEARITY OF DILUTION -

Tissue Lysate Dilution	Average % Expected Value	Range (%)
1:2	93	83-104
1:4	97	85-105

Cell Lysate Dilution	Average % Expected Value	Range (%)
1:2	92	81-103
1:4	95	83-104

### PRECISION –

	Intra-Assay	Inter-Assay
CV (%)	<10%	<12%

### 17. ASSAY SPECIFICITY

Cross Reactivity: This ELISA kit shows no cross-reactivity with any of the cytokines tested (e.g., Mouse 6Ckine, CTACK, Eotaxin, GCSF, GM-CSF, IL-2, IL-3, IL-4, IL-5, IL-6, IL-9, IL-10, IL-12p40, IL-12p70, IL-13, IL-17, IFN- $\gamma$ , KC, Leptin, MCP-5, MIP-1 $\alpha$ , MIP-2, MIP-3 $\beta$ , RANTES, SCF, sTNF $\alpha$ , TARC, TIMP-1, TNF- $\alpha$ , TPO, VEGF).

## 18. TROUBLESHOOTING

Problem	Cause	Solution
Poor standard curve	Inaccurate pipetting	Check pipettes
	Improper standards 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; change to overnight standard/sample incubation
	Inadequate reagent volumes or improper dilution	Check pipettes and ensure correct preparation
Large CV	Inaccurate pipetting	Check pipettes
High background	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 the reconstituted protein at -80°C, all other assay components 4°C. Keep substrate solution protected from light.

### 19. NOTES







## Technical Support

Copyright © 2023 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](http://www.abcam.com/contactus)

[www.abcam.cn/contactus](http://www.abcam.cn/contactus) (China)

[www.abcam.co.jp/contactus](http://www.abcam.co.jp/contactus) (Japan)