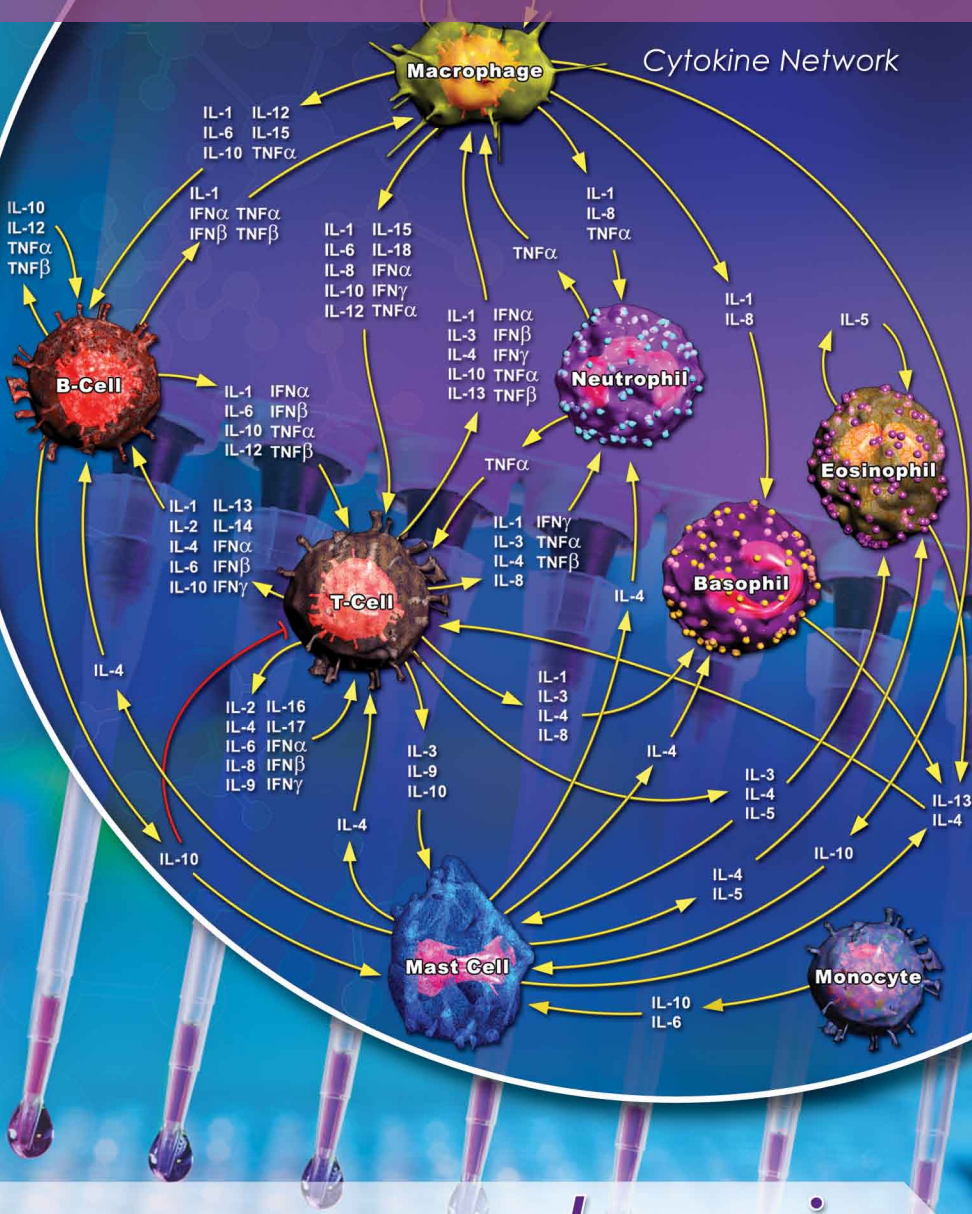


Human IL-1 β (Interleukin 1 Beta) Pre-Coated ELISA Kit

IFN α
IFN β
TNF α

Cytokine Network



USER MANUAL

abeomics
www.abeomics.com

Human IL-1 β (Interleukin 1 Beta) Pre-Coated ELISA Kit

Catalog No: 90-2082

1 \times 96 well Format (96 tests)

Detection Range: 7.8 – 500 pg/ml

Sensitivity: < 4.69 pg/ml

This immunoassay kit allows for the in vitro quantitative determination of Human IL-1 β concentrations in serum, plasma and other biological fluids.

This kit is for Research Use Only. Not for use in diagnostic/therapeutics procedures.

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I. BACKGROUND

IL-1 β is a potent pro inflammatory cytokine of the innate immune system that is involved in host defense against infection. Increased production of IL-1 β plays a pathogenic role in various inflammatory diseases, such as rheumatoid arthritis, gout, sepsis, stroke, and transplant rejection. IL-1 β binds type I (IL-1RI) and type II (IL-1RII) specific receptors. IL-1 β upon binding to IL-1RI activates a number of inflammatory pathways including NF- κ B (Nuclear Factor-Kappa B) and JNK (c-jun N-terminal kinase), which cause insulin resistance by attenuating IRS-1 (insulin receptor substrate-1) activation. IL-1 β is linked to diabetes through defective insulin secretion in pancreatic islets and increased IL-1 β production in adipose tissue of obese individuals decreases whole-body insulin sensitivity. IL-1 β also regulates the production of OPG (Osteoprotegerin), a natural inhibitor of RANKL. It also increases prostaglandin synthesis in bone which displays a potent resorption stimulus. In fact, after inflammatory stimulus, prostaglandins, such as prostaglandin E2 (PGE2), may mediate the upregulation of RANK by activating cell-surface receptors, thus regulating osteoclast differentiation, activation, and survival. Furthermore, IL-1 β also stimulates osteoclast activity by increasing production of M-CSF (Macrophage Colony-Stimulating Factor) and inhibits osteoclast apoptosis. Prolonged IL-1 β expression can also cause progressive immunopathology during *M. tuberculosis* infection. The paradoxical activities of IL-1 β in promoting both antimycobacterial immunity and chronic tissue damage have left the ultimate contribution of this cytokine to TB progression in human populations unclear.

II. OVERVIEW

This assay employs an antibody specific for anti-human IL-1 β coated on a 96-well plate. Standards and samples are pipetted into the wells and IL-1 β present in a sample is bound to the wells by the immobilized antibody. The wells are washed and biotinylated anti-human IL-1 β 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 β bound. The Stop Solution changes the color from blue to yellow, and the intensity of the color is measured at 450 nm.

III. ADVANTAGES

Multiple samples can be analyzed in a low volume, high-throughput format.

Full analysis can be completed in 2 hours.

IV. STORAGE

Kit can be stored in 4°C, if you are using within a week.

If you are using within 6 months, lyophilized standard can be stored in -20°C and other components at 4°C.

Kit Components

Item	Specifications	Storage
96 well Strip ELISA Plate	8 × 12 well	4°C
Lyophilized Standard	2 vials	-20°C
Sample and Standard Dilution Buffer	20 ml	4°C
Biotinylated Detection Antibody for hIL-1 β	120 μ l	4°C
Antibody Dilution Buffer	10 ml	4°C
HRP Conjugated Streptavidin (SABC)	120 μ l	4°C
SABC Dilution Buffer	10 ml	4°C
TMB Substrate	10 ml	4°C
Stop Solution	10 ml	4°C
25X Wash Buffer	30 ml	4°C
Plate Sealer	5 pieces	
Product Manual	1	

Material Required, (not supplied)

Microplate Reader

37°C Incubator

Plate Reader

Multi Chanel Pipette and disposable tips

Eppendorf Tubes

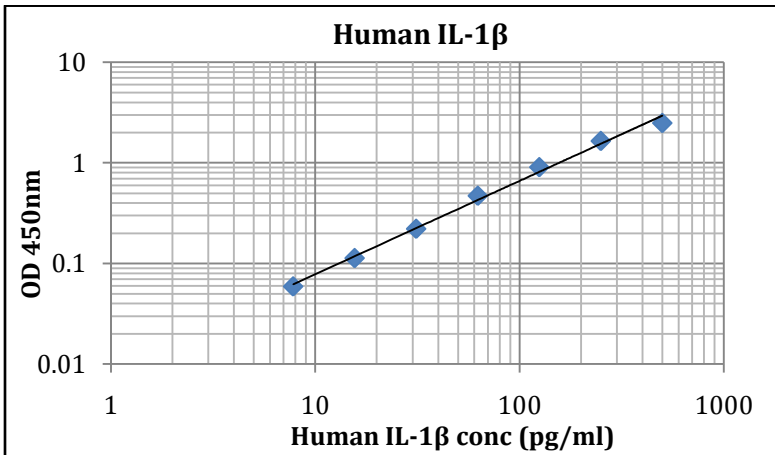
Deionized Water

V. PRECAUTIONS FOR USE

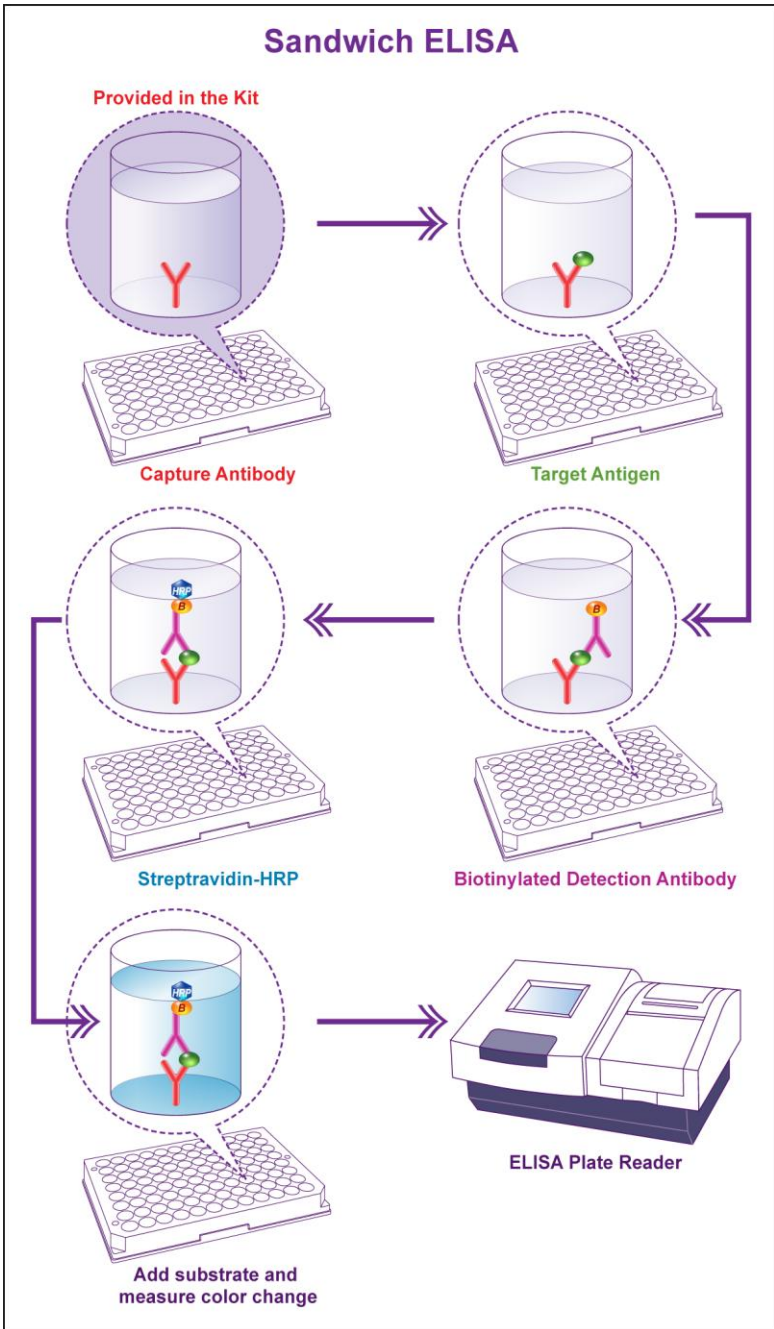
1. To inspect the validity of experiment operation and the appropriateness of sample dilution proportion, pilot experiment using standards and a small number of samples is recommended.
2. After opening and before using, keep plate dry.
3. Before using the Kit, spin tubes and bring down all components to the bottom of tubes.
4. Storage TMB reagents avoid light.
5. Washing process is very important, not fully wash easily cause a false positive.
6. Duplicate well assay is recommended for both standard and sample testing.
7. Don't let Micro plate dry at the assay, for dry plate will inactivate active components on plate.
8. Don't reuse tips and tubes to avoid cross contamination.
9. Avoid using the reagents from different batches together.

VI. STANDARD CURVE

Human IL-1 β Standard Curve is shown below.



X	pg/ml	500	250	125	62.5	31.2	15.6	7.8	0
Y	O.D.450	2.541	1.700	0.954	0.518	0.268	0.160	0.106	0.047



VII. REAGENT PREPARATION AND STORAGE

Included buffers and reagents are optimized for use with this kit. Substitution with other reagents is not recommended and may not give optimal results.

- 1. Prepare Standard Curve:** One hour before the experiment.
 - a.** Quick spin down one vial of lyophilized standard. (**DO NOT dilute standard directly on the plate**). Add 1ml of sample/standard dilution buffer into one of the standard tube. Incubate at room temperature for 10 min. Mix thoroughly by vortex. Stock Standard concentration is 500 pg/ml.
 - b.** Label 6 eppendorf tubes with 250 pg/ml, 125 pg/ml, 62.5 pg/ml, 31.2 pg/ml, 15.6 pg/ml and 7.8 pg/ml respectively. Add 0.3 ml of sample/ standard dilution buffer into each tube. Add 0.3 ml of stock standard (500 pg/ml) into 1st tube and mix thoroughly. Transfer 0.3 ml from 1st tube to 2nd tube and mix thoroughly. Transfer 0.3 ml from 2nd tube to 3rd tube mix thoroughly, and so on.

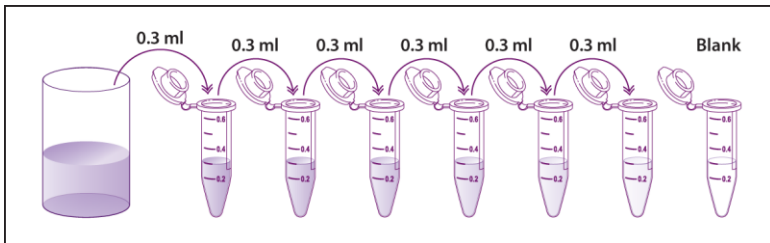


Fig 1: Dilution tubes

Note: Standard Solutions are best used within 2 hrs. Standard solution should be stored at 4°C for up to 12 hrs. or store at -20°C for up to 48 hrs. Avoid repeated freeze-thaw.

- 2. Sample Preparation and Storage:** Test samples should be collected, analyze immediately (within 2 hrs.) or aliquot and store at -20°C for long term. Avoid multiple freeze-thaw cycles.
 - a. Cell culture supernatants:** Centrifuge to remove precipitate, analyze immediately or aliquot and store at -20°C.

- b. Serum:** Coagulate the serum at room temperature about 1 hr. Centrifuge approximately 1000 \times g for 15 min. Analyze serum immediately or aliquot and store at -20°C.
- c. Plasma:** Collect plasma with heparin or EDTA as the anti-coagulant. Centrifuge for 15 min at 2-8°C at 1500 \times g within 30 min of collection. For eliminating the platelet effect, suggesting that further centrifugation for 10 min at 2-8°C at 10,000 \times g. Analyze immediately or aliquot and store frozen at -20°C.
- d. Tissue Homogenates:** For general information, hemolysis blood may affect the results, you should rinse the tissues with ice cold PBS (0.01M, pH 7.4) to remove excess blood thoroughly. Tissue pieces should be weighed and then minced to small pieces. This will be homogenized in PBS in a cold glass homogenizer. (Volume depends on the weight of the tissue, 1 gram of tissue requires 9 ml of ice cold PBS with protease inhibitor). To further break the cells, you can sonicate the suspension with an ultrasonic cell disrupter or subject it to freeze-thaw cycle. Homogenates are then centrifuged for 5 min. at 5000 \times g to get the supernatant.

***Note:** Samples to be used within 5 days may be store at 4°C, otherwise sample should be stored at -20°C (< 1 month) or -80°C (< 2 months) to avoid loss of bioactivity and contamination. Hemolyzed samples are not suitable for use in this Assay.*

- e.** End user should estimate the concentration of the target protein in the test samples first, then select proper dilution factor to make the diluted target protein concentration falls the optimal detection range of the kit. Dilute the samples with the provided dilution buffer. Several trials may be necessary in practice. The test sample should be well mixed with the dilution buffer. Standard curve and sample should be made before the experiment.

High target protein concentration 5-50 ng/ml: Dilute 1:100 (add 1 μ l of sample into 99 μ l of sample/ standard dilution buffer)

Medium target protein concentration 500-5000 pg/ml: Dilute 1:10 (add 10 μ l of sample into 90 μ l of sample/standard dilution buffer).

Low target protein concentration 7.8-500 pg/ml: Dilute 1:2 (add 50 μ l of sample into 50 μ l of sample/standard dilution buffer).

Very low target protein concentration <7.8 pg/ml: Do not dilute, use 100 μ l of sample.

- 3. Preparation of Biotin detection antibody working solution:** Prepare within one hour before the experiment. Calculate total volume working solution required. (0.1 ml/well \times number of wells. Add 100-200 μ l extra).

Dilute Biotin detection antibody with antibody dilution buffer at 1:100 and mix thoroughly. (*i.e.* add 1 μ l of Biotin conjugated detection antibody into 99 μ l of antibody dilution buffer).

- 4. Preparation of HRP-Streptavidin Conjugate (SABC) working solution:** Prepare within 30 min before the experiment. Calculate total volume working solution required. (0.1 ml/well \times number of wells. Add 100-200 μ l extra).

Dilute SABC with SABC dilution buffer at 1:100 and mix thoroughly. (*i.e.* add 1 μ l of SABC into 99 μ l of SABC dilution buffer).

- 5. Preparation of 1 X Wash buffer:** Prepare 1 X Wash buffer by diluting 25 X Wash buffer in sterile water. Diluted Wash buffer may be stored at 4 $^{\circ}$ C, however we recommend preparing fresh 1 X wash buffer for each experiment.

For example: 10 ml of 25X Wash buffer in 240 ml of sterile water.

VIII. ASSAY PROCEDURE

Before starting the experiment, equilibrate the SABC working solution and TMB substrate for at least 30 min at room temperature. When diluting samples and reagents, they should be mixed completely and evenly. It is recommended to plot a standard curve for each test.

If not all microplate strips will be used, remove the excess strips by pressing up from underneath each strip. Place excess strips back in the foil pouch with the included desiccant pack and reseal.

1. Set standard, test sample and blank (control zero) wells on the pre-coated plate and then record their position. It is recommended to measure each standard and sample in duplicate. (**Note:** Wash the plate twice before adding standard, sample and blank into the well).
2. Add 0.1 ml of standard 500 pg/ml, 250 pg/ml, 125 pg/ml, 62.5 pg/ml, 31.2 pg/ml, 15.6 pg/ml, 7.8 pg/ml and Blank (control zero dilution buffer) into standard well.
3. Add 0.1 ml of diluted samples into test sample wells.
4. Seal plate with a cover and incubate at 37°C for 90 min.
5. Remove the cover and discard samples and standard solution by tapping plate on an absorbent paper. (**Note:** DO NOT let the wells completely dry any time. DO NOT wash plate).
6. Add 0.1 ml of Biotin-detection antibody working solution into the above wells (Standards, control zero and samples).
7. Seal plate with cover and incubate at 37°C for 60 min.
8. Remove the cover, and wash plate 3 times with 1 X wash buffer.
9. Add 0.1 ml of SABC working solution into each well. Cover the plate and incubate at 37°C for 30 min.
10. Remove the cover and wash plate 5 times with 1 X wash buffer. Each time let the wash buffer stay in the well for 1-2 min.
11. Add 90 μ l of TMB substrate into each well, cover the plate and incubate at 37°C in dark within 15-30 min. (**Note:** This incubation time is for reference use only. The optimal time should be determined by end user. The shades of blue can be seen in the first 3-4 wells, only on most concentrated standards. Other wells show no obvious color.

12. Add 50 μ l of stop solution into each well and mix thoroughly. Color will change into yellow immediately.
13. Read O.D. absorbance at 450 nm in a micro-plate reader immediately after adding the stop solution.
14. Calculation: Relative O.D. 450 = O.D. for each well – O.D. 450 control zero well. The Standard curve can be plotted as the relative O.D. 450 of each standard solution in Y axis vs. the respective concentration of the standard in X axis. Concentration of the samples can be incorporated from the standard curve. If the samples were diluted, multiply the dilution factor to the concentration.

Table-1

	Standard 1	Standard 2	3	4	5	6	7	8	9	10	11	12
A	500 pg/ml	500 pg/ml										
B	250 pg/ml	250 pg/ml										
C	125 pg/ml	125 pg/ml										
D	62.5 pg/ml	62.5 pg/ml										
E	31.2 pg/ml	31.2 pg/ml										
F	15.6 pg/ml	15.6 pg/ml										
G	7.8 pg/ml	7.8 pg/ml										
H	0	0										

IX. REFERENCES

1. B7 Phosphocholine-Modified Macromolecules and Canonical Nicotinic Agonists Inhibit ATP-Induced IL-1 β Release.
J Immunol. 2015 Sep 1;195(5):2325-34. doi:
PMID: 26202987
2. The role of IL-1 β in the bone loss during rheumatic diseases.
PMID: 25954061

3. Interleukin-1 β inhibits insulin signaling and prevents insulin-stimulated system A amino acid transport in primary human trophoblasts.
PMID: 23891856

4. Allele-specific induction of IL-1 β expression by C/EBP β and PU.1 contributes to increased tuberculosis susceptibility.
PMID: 25329476

X. TROUBLE SHOOTING

Problem	Probable Cause	Suggestion
No signal	Forgot to add all components.	Prepare check list and add the components in the correct order.
Low signal	Not enough lysates per well.	Check the protein concentration. Add more lysates.
High background	Washing is not sufficient.	Wash plates thoroughly after incubation with Streptavidin-HRP secondary



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