



ELISA PRODUCT INFORMATION & MANUAL

Human IL18R1 ELISA Kit (Colorimetric)

NBP2-80338

Sample Insert for Reference Only

Enzyme-linked Immunosorbent Assay for quantitative
detection. For research use only.

Not for diagnostic or therapeutic procedures.

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BACKGROUND

Interleukin-18 receptor 1 (IL18R1) also known as CD218 antigen-like family member A, CDw218a, IL1 receptor-related protein and CD218a, is an interleukin receptor of the immunoglobulin superfamily. IL18R1 is found expressed in lung, leukocytes, spleen, liver, thymus, prostate, small intestine, colon, placenta, and heart, and is absent from brain, skeletal muscle, pancreas, and kidney. High level of expression is found in Hodgkin disease cell lines. This receptor is specifically binds interleukin 18 (IL18), and is essential for IL18 mediated signal transduction. IL18R1 contains 3 Ig-like C2-type (immunoglobulin-like) domains and 1 TIR domain. It is a single-pass type I membrane protein. IFN-alpha and IL12 are reported to induce the expression of this receptor in NK and T cells. The increased expression of IL18R1 may contribute pathogenically to disease and is therefore a potential therapeutic target. The absence of a genetic association in the IL18R1 gene itself suggests regulation from other parts of the genome, or as part of the inflammatory cascade in multiple sclerosis without a prime genetic cause.

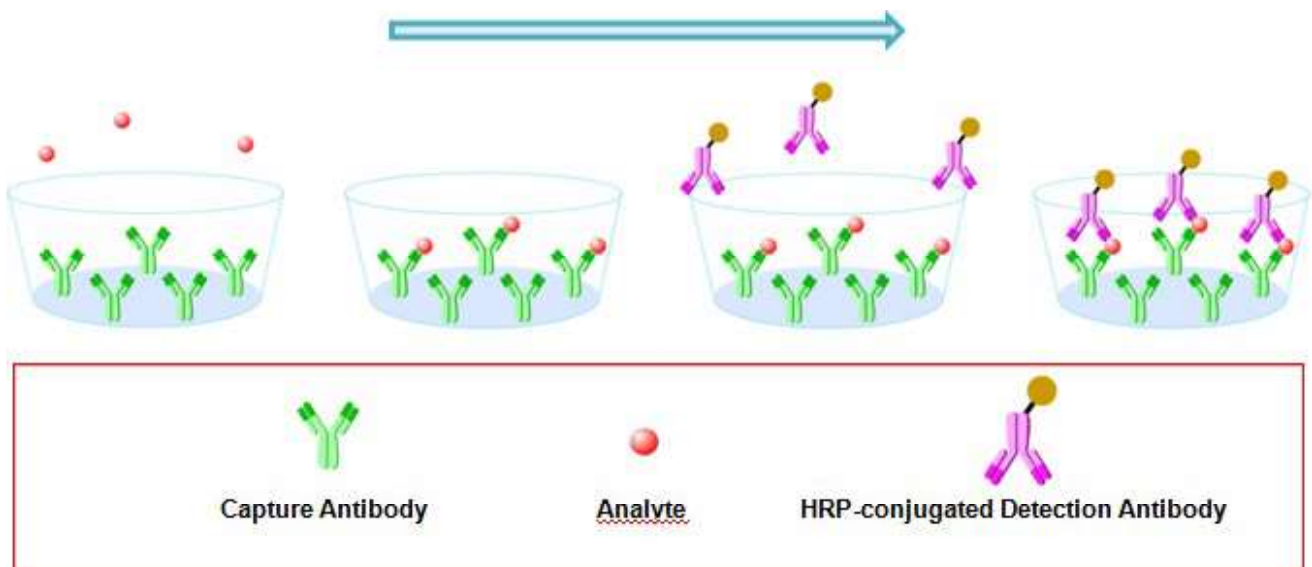
INTENDED USE

For the quantitative determination of Human IL18R1 concentration in serum.

The use of this kit for other sample types need be validated by the end user due to the complexity of natural targets and unpredictable interference.

PRINCIPLE OF THE ASSAY

The principle of this ELISA kit is based on the solid phase sandwich enzyme immunoassay technique. A monoclonal antibody specific for Human IL18R1 has been pre-coated onto well plate strips. Standards and samples are added to the wells and Human IL18R1 present in the sample is bound by the immobilized antibody. After incubation the wells are washed and a horseradish peroxidase conjugated anti-Human IL18R1 antibody is added, producing an antibody-antigen-antibody "sandwich complex". Following a wash to remove any unbound antibody a TMB substrate solution is loaded and color develops in proportion to the amount of Human IL18R1 bound. The reaction is stopped by the addition of a stop solution and the intensity of the color can be measured at 450 nm (See schematics below).



MATERIALS PROVIDED

Human IL18R1 Microplate - 96 well polystyrene microplate (12 strips of 8 wells) coated with rabbit monoclonal antibody against Human IL18R1.

Human IL18R1 Detection Antibody - 0.2 mg/mL of mouse monoclonal antibody against Human IL18R1 conjugated to horseradish peroxidase (HRP) with preservatives.

Human IL18R1 Standard - Recombinant Human IL18R1 in a buffer with preservatives, lyophilized. The amount of standard is lot specific and indicated on the label of standard vial.

Wash Buffer Concentrate - 25 mL of a 20-fold concentrated solution of buffered surfactant with preservatives.

Dilution Buffer Concentrate - 8 mL of a 20-fold concentrated dilution buffer with preservatives.

Color Reagent A - 13 mL of stabilized hydrogen peroxide.

Color Reagent B - 13 mL of stabilized chromogen (tetramethylbenzidine).

Stop Solution - 8 mL of 2 N sulfuric acid.

STORAGE

| | | |
|-----------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Unopened Kit | Store at 2 - 8°C and the kit is stable for 6 months upon receipt. | |
| Opened/ Reconstituted Reagents | Diluted Wash Buffer | Stored for up to 1 week at 2 - 8°C |
| | Diluted Dilution Buffer | |
| | Conjugate | Stored for up to 1 month at 2 - 8°C |
| | Stop Solution | |
| | Unmixed Color Reagent A | |
| | Unmixed Color Reagent B | |
| | Standard | After reconstitution, store for up to 1 month at -80°C. The reconstituted standards should be aliquoted and avoid repeated freeze-thaw cycles. |
| | Microplate Wells | Return unused strips to the foil pouch containing the desiccant pack and reseal along entire edge of zip-seal. Stored for up to 1 month at 2 - 8°C |

OTHER SUPPLIES REQUIRED

- Microplate reader capable of measuring absorbance at 450 nm
- Pipettes and pipette tips
- Deionized or distilled water
- Multi -channel pipette, squirt bottle, manifold dispenser, or automated microplate washer
- 500 mL graduated cylinder
- Tubes for standard dilution
- Well plate cover or seals

PRECAUTIONS

1. This kit is **for research use only** and is not for use in diagnostic or therapeutic procedures.
2. The kit should not be used beyond the expiration date.
3. Do not mix reagents from different lots.
4. The kit is designed and tested to detect the specific targets and samples shown in the manual. The use of this kit for other purpose should be verified carefully by the end user.

SAFETY INSTRUCTIONS

5. The Stop Solution provided with this kit is an acid solution. Take care when using the reagent to avoid the risk.
6. All biological materials should be handled and discarded as potentially hazardous following local laws and regulations.
7. Personal protective equipments such as lab coats, gloves, surgical masks and goggles are necessary in experiments for safety reasons.

TECHINICAL TIPS

8. Bring all reagents and samples to room temperature before use.
9. Samples should be thawed completely and mixed well prior to analysis. Avoid repeated freeze-thaw cycles of frozen samples.
10. A standard curve should be generated for each set of sample assayed. **DONOT** USE the standard curves from other plates or other days.
11. Use a new disposable reagent reservoir and new disposable pipette tips for each transfer to avoid cross-contamination.
12. Read the absorbance of each well within 20 minutes after adding the stop solution.

SAMPLE COLLECTION AND STORAGE

Serum - Use a serum separator tube and allow samples to clot for 30 minutes before centrifugation for 15 minutes at 1000 x g. Remove serum and assay immediately or aliquot and store samples at -20°C or lower temperature. **Avoid repeated freeze -thaw cycles.**

Note:

The sample should be diluted to within the working range of the assay in 1 × dilution buffer. The exact dilution must be determined based on the concentration of specific target in individual samples.

REAGENT PREPARATION

Bring all reagents to room temperature before use. If crystals have formed in buffer solution, warm to room temperature and mix gently until the crystals have completely dissolved.

Wash Buffer - Prepare 1× wash buffer by adding 20 mL of Wash Buffer Concentrate to deionized or distilled water to prepare 400 mL of Wash Buffer.

Dilution Buffer - Prepare 1× dilution buffer by adding 5 mL of Dilution Buffer Concentrate to deionized or distilled water to prepare 100 mL of Dilution Buffer.

Detection Antibody - Centrifuge at 10,000 x g for 20 seconds. Dilute to **work concentration** of 0.5 µg/mL in Dilution Buffer before use.

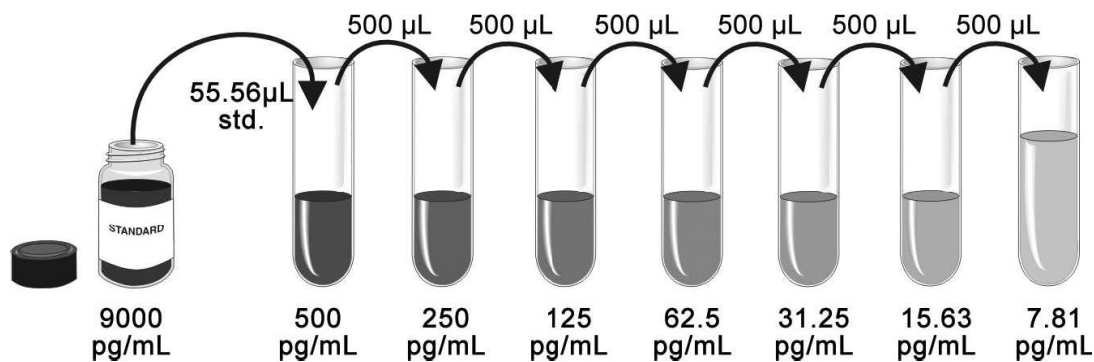
Substrate Solution - Color Reagents A and B should be mixed together in equal volumes within 15 minutes of use. Protect from light. 200 µL of the resultant mixture is required per well. **Take care not to contaminate the Color Reagent. If the mixed color reagent is blue. DO NOT USE.**

Human IL18R1 Standard - Reconstitute the Human IL18R1 Standard with 1 mL of Dilution Buffer to make stock solution. Shake the vial gently until the lyophilized powder totally dissolved (**Do not turn the vial upside down**). Mix the standard to ensure complete reconstitution prior to making dilutions.

Prepare serially diluted standards as described in the following step:

Pipette 1000 μL of Dilution Buffer into the 500 pg/mL tube. Pipette 500 μL of Dilution Buffer into the remaining tubes. Use the stock solution to produce a dilution series as the following figure. Mix each tube thoroughly before the next transfer. The 500 pg/mL standard serves as the high standard. The Dilution Buffer serves as the zero standard (0 pg/mL). **Ensures each assay has a standard curve. DO NOT USE the standard curve on other plates or other days.**

The following graph is only for demonstration purposes. The concentration of stock solution is lot specific and need be calculated with the actual amount of standard labeled on the standard vial.



ASSAY PROCEDURE

Bring all reagents and samples to room temperature before use. It is recommended that all samples and standards be assayed in duplicate.

1. Prepare all reagents, working standards, and samples as directed in the previous sections.
2. Remove unused microplate strips from the plate frame, return them to the foil pouch containing the desiccant pack, and reseal.
3. Wash each well three times with Wash Buffer (300 μ L/well) using a squirt bottle, multi-channel pipette, manifold dispenser or autowasher. **Complete removal of liquid at each step is essential to good performance. Remove any remaining Wash Buffer by aspirating or decanting. Invert the plate and blot it against clean paper towels.**
4. Add 100 μ L of each serially diluted protein standard or test sample per well including a zero standard. **Ensure reagent addition is uninterrupted and completed within 15 minutes.** Cover/seal the plate and incubate for 2 hours at room temperature.
5. Repeat the aspiration/wash as in Step 3.
6. Add 100 μ L of Detection Antibody in working concentration to each well. Cover/seal the plate and incubate for 1 hour at room temperature.
7. Repeat the aspiration/wash as in Step 3.
8. Add 200 μ L of Substrate Solution to each well. Incubate for 20 minutes at room temperature. **Protect from light.**
9. Add 50 μ L of Stop Solution to each well. If color change does not appear uniform, gently tap the plate to ensure thorough mixing.
10. **Determine the optical density of each well within 20 minutes**, using a microplate reader set to 450 nm.

CALCULATION OF RESULTS

If samples generate values higher than the highest standard, dilute the samples and repeat the assay.

Calculate the mean absorbance for each standard, control and sample and subtract average zero standard optical density (O.D.) .

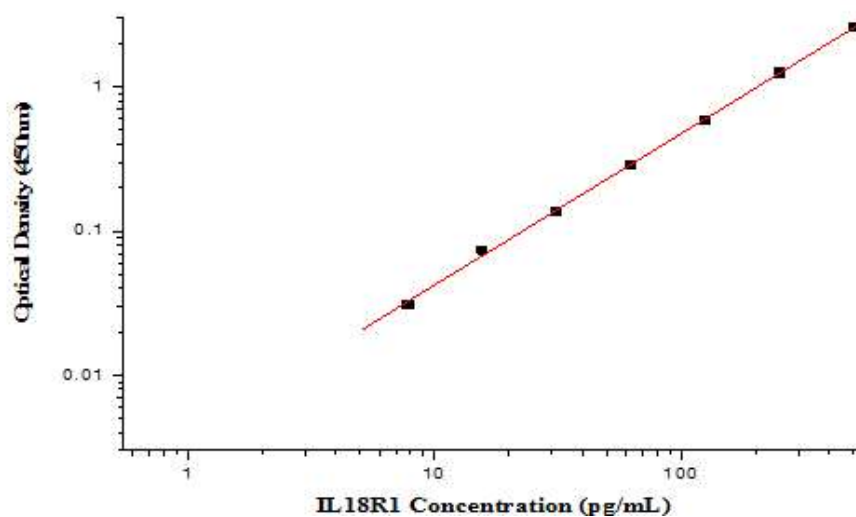
Construct a standard curve by plotting the mean absorbance for each standard on the y-axis against the concentration on the x-axis and draw a best fit curve through the points on the graph. Most graphing software can help make the curve and a four parameter logistic (4-PL) usually provide the best fit, though other equations (e.g. linear, log/log) can also be tried to see which provides the most accurate.

Extrapolate the target protein concentrations for unknown samples from the standard curve plotted.

TYPICAL DATA

This standard curve is only for demonstration purposes. A standard curve should be generated for each assay.

| Concentration (pg/mL) | Zero standard subtracted OD |
|------------------------|-----------------------------|
| 0 | 0 |
| 7.81 | 0.031 |
| 15.63 | 0.074 |
| 31.25 | 0.135 |
| 62.5 | 0.286 |
| 125 | 0.592 |
| 250 | 1.250 |
| 500 | 2.564 |



PRECISION

Intra-assay Precision (Precision within an assay)

Three samples of known concentration were tested twenty times on one plate to assess intra-assay precision.

Inter-assay Precision (Precision between assays)

Three samples of known concentration were tested in five separate assays to assess inter-assay precision.

| | Intra -assay Precision | | | Inter -assay Precision | | |
|--------------|------------------------|------|------|------------------------|------|-------|
| Sample | 1 | 2 | 3 | 1 | 2 | 3 |
| N | 20 | 20 | 20 | 5 | 5 | 5 |
| Mean (pg/mL) | 50 | 96 | 199 | 16 | 53 | 207 |
| SD | 1.76 | 5.45 | 8.93 | 2.11 | 4.79 | 21.69 |
| CV (%) | 3.5% | 5.7% | 4.5% | 13.2% | 9.1% | 10.5% |

RECOVERY

The recovery of Human IL18R1 spiked to different levels throughout the range of the assay in related matrices was evaluated.

| Sample | Average % Recovery | Range |
|-------------|--------------------|---------|
| serum (n=3) | 85 | 83 -90% |

LINEARITY

| | | Serum |
|------|----------------------|-------|
| 1:2 | recovery of detected | 100% |
| 1:4 | recovery of detected | 100% |
| 1:8 | recovery of detected | 107% |
| 1:16 | recovery of detected | 91% |

SENSITIVITY

The minimum detectable dose (MDD) of Human IL18R1 is typically less than 3.49 pg/mL. The MDD was determined by adding three standard deviations to the mean optical density value of twenty zero standard replicates and calculating the corresponding concentration.

CALIBRATION

This immunoassay is calibrated against a highly purified HEK 293-expressed recombinant Human IL18R1.

SAMPLE VALUES

The average concentration of IL18R1 in 10 normal human serum is 0.07 +/- 0.01 ng/mL ranging from 0.04 to 0.08 ng/mL.

SPECIFICITY

This assay recognizes both recombinant and natural Human IL18R1. The factors listed below were prepared at 10 or 50 ng/mL in dilution buffer and assayed for cross-reactivity. No cross -reactivity was observed.

| Recombinant human | | | |
|-------------------|---------------|--------|---------------|
| IL1R1 | IL1R2 | IL1R3 | IL1R4 |
| IL1R7 | IL1R8 | IL1R9 | SIGIRR |
| IL1 | IL2 | IL4 | IL6 |
| IL8 | IL10 | IL33 | TNF- α |
| PDGF | IFN- γ | VEGF | MIP-1 β |
| TIMP1 | TIMP2 | GM-CSF | SCF |
| Recombinant mouse | | | |
| IL18R1 | | | |

Preparations of IL18 prepared at 5 ng/mL in a mid-range recombinant human IL18R1 control was assayed for interference. No significant interference was observed.

TROUBLE SHOOTING

| Problems | Possible Sources | Solutions |
|-----------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No signal | Incorrect or no Detection Antibody was added | Add appropriate Detection Antibody and continue |
| | Substrate solution was not added | Add substrate solution and continue |
| | Incorrect storage condition | Check if the kit is stored at recommended condition and used before expiration date |
| Poor Standard Curve | Standard was incompletely reconstituted or was inappropriately stored | Aliquot reconstituted standard and store at -80°C . The reconstituted standards should be aliquoted and avoid repeated freeze-thaw cycles. |
| | Imprecise / inaccurate pipetting | Check / calibrate pipettes |
| | Incubations done at inappropriate temperature, timing or agitation | Follow the general ELISA protocol |
| | Background wells were contaminated | Avoid cross contamination by using the sealer appropriately |
| Poor detection value | The concentration of antigen in samples was too low | Enriching samples to increase the concentration of antigen |
| | Samples were ineffective | Check if the samples are stored at cold environment. Detect samples in timely manner |
| High Background | Insufficient washes | Use multichannel pipettes without touching the reagents on the plate |
| | | Increase cycles of washes and soaking time between washes |
| | Color Reagent should be clear and colorless prior to addition to wells | Color Reagent should be clear and colorless prior to addition to wells |
| | Use clean tubes and pipettes tips | Use clean plates, tubes and pipettes tips |
| Non-specificity | Samples were contaminated | Avoid cross contamination of samples |
| | The concentration of samples was too high | Try higher dilution rate of samples |

ASSAY SUMMARY

