Human IL-12 (IL12A & IL12B Heterodimer) ELISA Pair Set

Catalog Number : SEKCT011

To achieve the best assay results, this manual must be read carefully before using this product and the assay is run as summarized in the General ELISA protocol.
BACKGROUND
Interleukin-12 (IL-12), also known as natural killer cell stimulatory factor (NKSF) or cytotoxic lymphocyte maturation factor (CLMF), is a 70 kDa disulfide-linked heterodimeric cytokine composed of a 35-kD subunit P35 and a 40-kD subunit P40, also designated as IL-12A (Interleukin-12 subunit alpha) and IL-12B (Interleukin-12 subunit beta). IL-12 is predominantly produced by macrophages and B lymphocytes and plays an important role in the activities of natural killer cells and T lymphocytes. IL-12 is involved in the differentiation and development of Th1 cells, enhancement of natural killer cytolytic function and mitogenic effects, as well as induction of IFN-gamma during which it can synergize with other IFN-gamma inducers. The most powerful inducers of IL-12 production are bacteria, bacterial products and parasites. IL-12A shows significant sequence similarity to IL-6, G-CSF, and exerts biological activities only when the IL-12B is co-expressed. IL-12B deficient mice are resistant to the induction of experimental chronic inflammatory diseases whereas IL-12A knock-out mice develop more severe forms, suggesting opposite functions of the two subunits in the outcome of chronic inflammatory diseases.
PRINCIPLE OF THE TEST
The Sino Biological ELISA Pair Set is a solid phase sandwich ELISA (Enzyme-Linked Immunosorbent Assay). It utilizes a monoclonal antibody specific for Human IL-12 (IL12A & IL12B Heterodimer) coated on a 96-well plate. Standards and samples are added to the wells, and any Human IL-12 (IL12A & IL12B Heterodimer) present binds to the immobilized antibody. The wells are washed and a horseradish peroxidase conjugated rabbit anti-Human IL-12 (IL12A & IL12B Heterodimer) monoclonal antibody is then added, producing an antibody-antigen-antibody “sandwich”. The wells are again washed and TMB substrate solution is loaded, which produces color in proportion to the amount of Human IL-12 (IL12A & IL12B Heterodimer) present in the sample. To end the enzyme reaction, the stop solution is added and absorbances of the microwell are read at 450 nm.

INTENDED USE
◆ The Human IL-12 (IL12A & IL12B Heterodimer) ELISA Pair Set is for the quantitative determination of Human IL-12 (IL12A & IL12B Heterodimer).

◆ This ELISA Pair Set contains the basic components required for the development of sandwich ELISAs.

ASSAY PROCEDURE SUMMARY

This Pair Set has been configured for research use only and is not to be used in diagnostic procedures.
MATERIALS PROVIDED

Bring all reagents to room temperature before use.

Capture Antibody – 1 mg/mL of rabbit anti-Human IL-12 (IL12A & IL12B Heterodimer) monoclonal antibody (in PBS, pH 7.4). Dilute to a working concentration of 2 μg/mL in PBS before coating. (Catalog: # CT011-R001)

Detection Antibody – 0.2 mg/mL of rabbit anti-Human IL-12 (IL12A & IL12B Heterodimer) monoclonal antibody conjugated to horseradish-peroxidase (HRP) (in PBS, 50 % HRP-Protector, pH 7.4, store at 4°C). Dilute to working concentration of 0.5 μg/mL in detection antibody dilution buffer before use. (Catalog: # CT011-R070)

Standard – Each vial contains 50 ng of recombinant Human IL-12 (IL12A & IL12B Heterodimer). Reconstitute with 1 mL detection antibody dilution buffer. After reconstitution, store at -20°C to -80°C in a manual defrost freezer. A seven-point standard curve using 2-fold serial dilutions in sample dilution buffer, and a high standard of 2000 pg/mL is recommended.

SOLUTIONS REQUIRED

PBS - 136.9 mM NaCl, 10.1 mM Na₂HPO₄, 2.7 mM KCl, 1.8 mM KH₂PO₄, pH 7.4, 0.2 μm filtered
TBS - 20 mM Tris, 150 mM NaCl, pH 7.4
Wash Buffer - 0.05% Tween20 in TBS, pH 7.2 - 7.4
Blocking Buffer - 2% BSA in Wash Buffer
Sample dilution buffer - 0.1% BSA in wash buffer, pH 7.2 - 7.4, 0.2 μm filtered
Detection antibody dilution buffer - 0.5% BSA in wash buffer, pH 7.2 - 7.4, 0.2 μm filtered
Substrate Solution: To achieve best assay results, fresh substrate solution is recommended
Substrate stock solution - 10mg / ml TMB (Tetramethylbenzidine) in DMSO
Substrate dilution buffer - 0.05M Na₂HPO₄ and 0.025M citric acid; adjust pH to 5.5
Substrate working solution - For each plate dilute 250 μl substrate stock solution in 25ml substrate dilution buffer and then add 80 μl 0.75% H₂O₂, mix it well
Stop Solution - 2 N H₂SO₄

PRECAUTION

The Stop Solution suggested for use with this Pair Set is an acid solution. Wear eye, hand, face, and clothing protection when using this material.
STORAGE

**Capture Antibody**: Aliquot and store at -20°C to -80°C for up to 6 months from date of receipt. Avoid repeated freeze-thaw cycles.

**Detection Antibody**: Store at 4°C and protect it from prolonged exposure to light for up to 6 months from date of receipt. **DO NOT FREEZE!**

**Standard**: Store lyophilized standard at -20°C to -80°C for up to 6 months from date of receipt. Aliquot and store the reconstituted standard at -80°C for up to 1 month. Avoid repeated freeze-thaw cycles.
GENERAL ELISA PROTOCOL

Plate Preparation
1. Dilute the capture antibody to the working concentration in PBS. Immediately coat a 96-well microplate with 100μL per well of the diluted capture antibody. Seal the plate and incubate overnight at 4°C.
2. Aspirate each well and wash with at least 300μl wash buffer, repeating the process two times for a total of three washes. Complete removal of liquid at each step is essential for good performance. After the last wash, remove any remaining wash buffer by inverting the plate and blotting it against clean paper towels.
3. Block plates by adding 300 μL of blocking buffer to each well. Incubate at room temperature for a minimum of 1 hour.
4. Repeat the aspiration/wash as in step 2. The plates are now ready for sample addition.

Assay Procedure
1. Add 100 μL of sample or standards in sample dilution buffer per well. Seal the plate and incubate 2 hours at room temperature.
2. Repeat the aspiration/wash as in step 2 of plate preparation.
3. Add 100 μL of the detection antibody, diluted in antibody dilution buffer, to each well. Seal the plate and incubate 1 hour at room temperature.
4. Repeat the aspiration/wash as in step 2 of plate preparation.
5. Add 200 μL of substrate solution to each well. Incubate for 20 minutes at room temperature (if substrate solution is not as requested, the incubation time should be optimized). Avoid placing the plate in direct light.
6. Add 50 μL of stop solution to each well. Gently tap the plate to ensure thorough mixing.
7. Determine the optical density of each well immediately, using a microplate reader set to 450 nm.

CALCULATION OF RESULTS
● Calculate the mean absorbance for each set of duplicate standards, controls and samples. Subtract the mean zero standard absorbance from each.
● 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.
● To determine the concentration of the unknowns, find the unknowns’ mean absorbance value on the y-axis and draw a horizontal line to the standard curve. At the point of intersection, draw a vertical line to the x-axis and read the concentration. If samples have been diluted, the concentration read from the standard curve must be multiplied by the dilution factor.
● Alternatively, computer-based curve-fitting statistical software may also be employed to calculate the concentration of the sample.
TYPICAL DATA
This standard curve is only for demonstration purposes. A standard curve should be generated for each assay.

![Graph showing typical data]

<table>
<thead>
<tr>
<th>Concentration (pg/mL)</th>
<th>Zero standard subtracted OD</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>39.06</td>
<td>0.031</td>
</tr>
<tr>
<td>78.12</td>
<td>0.062</td>
</tr>
<tr>
<td>156.25</td>
<td>0.123</td>
</tr>
<tr>
<td>312.5</td>
<td>0.254</td>
</tr>
<tr>
<td>625</td>
<td>0.534</td>
</tr>
<tr>
<td>1250</td>
<td>1.079</td>
</tr>
<tr>
<td>2500</td>
<td>2.244</td>
</tr>
</tbody>
</table>

PERFORMANCE CHARACTERISTIC
SENSITIVITY
The minimum detectable dose of Human IL-12 (IL12A & IL12B Heterodimer) was determined to be approximately 39.06 pg/ml. This is defined as at least three times standard deviations above the mean optical density of 10 replicates of the zero standard.
## TROUBLE SHOOTING

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