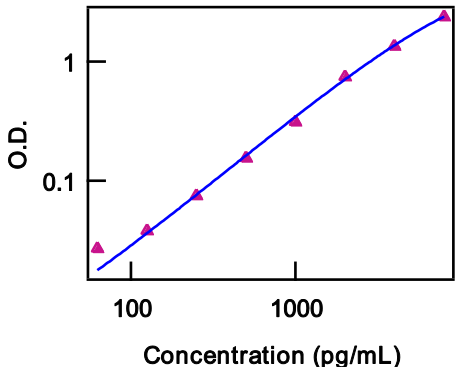
Human IL-27 ELISA Ready-SET-Go!®

Catalog Number: 88-7278
Also known as: Interleukin-27
RUO: For Research Use Only. Not for use in diagnostic procedures.



Standard curve of Human IL-27 ELISA Ready-SET-Go!®

Product Information

Contents: Human IL-27 ELISA Ready-SET-Go!®
REF **Catalog Number:** 88-7278
Sensitivity: 64 pg/mL
Standard Curve Range: 64 - 8,000 pg/mL

Temperature Limitation: Store at 2-8°C except standard which should be stored at less than or equal to -70°C.
LOT **Batch Code:** Refer to vial
Use By: Refer to vial

Description

This Human IL-27 ELISA Ready-SET-Go!® set includes all of the necessary buffers and reagents to perform enzyme-linked immunosorbent assays. This kit allows the specific detection of IL-27 with no detection of IL-35 or free p28 or EBI3. This set has been optimized for the accurate and precise measurement of human IL-27 in serum, plasma, and tissue culture supernatant samples. Serum and plasma samples must be diluted 2-fold in prepared assay diluent prior to evaluation in this ELISA.

IL-27 is a member of the IL-12 family, a subgroup of the IL-6 family of cytokines. It is a heterodimer of the subunits EBI3 (Epstein-Barr Virus Induced Gene 3), which is homologous to the p40 subunit shared by IL-12 and IL-23, and p28 (IL-30), which is homologous to p35. IL-27 is produced by activated dendritic cells and macrophages in response to TLR ligands and inflammatory cytokines.

The IL-27 receptor shares one subunit, gp130, with other members of the IL-6 family. The subunit WSX-1 (IL-27Rα, TCCR) is unique to IL-27 and is believed to be the only part of the receptor that interacts with the cytokine. The IL-27R is most abundantly expressed on activated T-cells and NK cells, although expression has also been shown on B-cells and naïve T-cells. IL-27R activation leads to the phosphorylation of Jak/STAT proteins, with STAT1 and STAT3 being critical to the function of IL-27. IL-27 has been shown to have both pro-inflammatory and anti-inflammatory effects. It influences the commitment of $CD4^+$ T-cells toward the Th1 lineage by inducing the expression of the T-bet transcription factor and the upregulation of IL-12Rβ2. Its anti-inflammatory functions include the suppression of Th2 and Th17 proliferation and differentiation. Susceptibility to T-cell mediated autoimmunity has been observed in WSX-1 knockout mice.

Components

Capture Antibody. Pre-titrated, purified antibody
Detection Antibody. Pre-titrated, biotin-conjugated antibody
Standard. Recombinant cytokine for generating standard curve and calibrating samples
Coating Buffer. 10X PBS Coating Buffer
Assay Diluent. 5X Concentrated

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Detection Enzyme. Pre-titrated Avidin-HRP
Substrate Solution. Tetramethylbenzidine (TMB) Solution
Certificate of Analysis. Lot-specific instructions for the dilution of antibodies and standards
96-Well Plates. Corning Costar flat-bottom plates (included in catalog numbers ending with -22 and -86)

Applications Reported
This ELISA set is for the quantitative detection of human IL-27 in serum, plasma, and tissue culture supernatant samples.

Applications Tested
This assay has been validated for the detection of endogenous human IL-27 with supernatant collected from an LPS-stimulated culture of mature human dendritic cells. No IL-27 was detected from unstimulated cells. Additionally, no human IL-27 was detected in serum and plasma samples collected from normal donors.

The use of a p28-specific capture antibody and EBI3-specific detection antibody ensures the specificity of this ELISA to the human IL-27 heterodimer. This assay was tested for specificity on a panel of 72 cytokines at 100 ng/ml. No cross-reactivity was observed to any sample.

References
Stumhofer JS and Hunter CA. Advances in understanding the anti-inflammatory properties of IL-27. Immunol Lett. 2008 May 15; 117(2): 123-30.

Stumhofer JS, Laurence A, Wilson EH, Huang E, Tato CM, Johnson LM, Villarino AV, Huang Q, Yoshimura A, Sehy D, Saris CJM, OShea JJ, Henninghausen L, Ernst M, Hunter CA. Interleukin 27 negatively regulates the development of interleukin 17- producing T helper cells during chronic inflammation of the central nervous system. Nat Immunol. 2006 Sep; 7(9): 899-901

Yoshimura A, Yoshida H, Miyazaki Y, Kinjyo I, Ishibashi T, Yoshimura T, Takeda A, Hamano S. Two sided roles of IL-27: induction of Th1 differentiation on Naïve CD4+ T cells versus suppression of proinflammatory cytokine production including IL-23-induced IL-17 on activated CD4+ T cells partially through STAT3-dependent mechanism. J Immunol. 2006; 177: 5377-85.

Related Products
88-7274 Mouse IL-27 ELISA Ready-SET-Go!®

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Enzyme Linked Immunosorbent Assay (ELISA)

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Protocol: ELISA Ready-Set-Go!

The following protocol is a general guideline for the Ready-SET-Go! Sets

Materials Provided

- Please refer to the Certificate of Analysis (C of A) for components

Other Materials Needed

- Buffers*
  - Wash Buffer: 1x PBS, 0.05% Tween-20 (or eBioscience ELISA Wash Buffer Powder, Cat. No. 00-0400)
  - Stop Solution: 1M H_3PO_4 (recommended) or 2N H_2SO_4
- Pipettes
- Refrigerator & frost-free -20°C freezer
- 96-well plate (Corning Costar 9018 or NUNC Maxisorp®)
  NOTE: The use of ELISA plates which are not high affinity protein binding plates will result in suboptimal performance, e.g., low signal or inconsistent data. Do not use tissue culture plates or low protein absorption plates. Use only the Corning Costar 9018 or NUNC Maxisorp (Cat. No. 44-2404) 96-well plates
- 96-well ELISA plate reader (microplate spectrophotometer)
- ELISA plate washer (highly recommended)

NOTE: To ensure optimal results from this ELISA Ready-SET-Go! Set, please only use the components included in the set. Exchanging of components is not recommended as a change in signal may occur.

Time Requirements

- 1 overnight incubation
- 4½-hour incubations
- 1 hour washing and analyzing samples

Experimental Procedure

1. Coat Corning Costar 9018 (or Nunc Maxisorp®) ELISA plate with 100 µL/well of capture antibody in Coating Buffer (dilute as noted on C of A, which is included with the reagent set). Seal the plate and incubate overnight at 4°C.
2. Aspirate wells and wash 3 times with >250 µL/well Wash Buffer*. Allowing time for soaking (~ 1 minute) during each wash step increases the effectiveness of the washes. Blot plate on absorbent paper to remove any residual buffer.
3. Dilute 1 part 5X concentrated Assay Diluent with 4 parts DI water.* Block wells with 200 µL/well of 1X Assay Diluent. Incubate at room temperature for 1 hour.
4. Optional: Aspirate and wash at least once with Wash Buffer.
5. Using 1X Assay Diluent*, dilute standards as noted on the C of A to prepare the top concentration of the standard. Add 100 µL/well of top standard concentration to the appropriate

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wells. Perform 2-fold serial dilutions of the top standards to make the standard curve for a total of 8 points. Add 100 µL/well of your samples to the appropriate wells. Seal the plate and incubate at room temperature for 2 hours (or overnight at 4°C for maximal sensitivity).

6. Aspirate/wash as in step 2. Repeat for a total of 3-5 washes**.
7. Add 100 µL/well of detection antibody diluted in 1X Assay Diluent* (dilute as noted on C of A). Seal the plate and incubate at room temperature for 1 hour.
8. Aspirate/wash as in step 2. Repeat for a total of 3-5 washes**.
9. Add 100 µL/well of Avidin-HRP* diluted in 1X Assay Diluent (dilute as noted on C of A). Seal the plate and incubate at room temperature for 30 minutes.
10. Aspirate and wash as in step 2. In this wash step, soak wells in Wash Buffer* for 1 to 2 minutes prior to aspiration. Repeat for a total of 5-7 washes**.
11. Add 100 µL/well of Substrate Solution to each well. Incubate plate at room temperature for 15 minutes.
12. Add 50 µL of Stop Solution to each well.
13. Read plate at 450 nm. If wavelength subtraction is available, subtract the values of 570 nm from those of 450 nm and analyze data.

NOTES:

**** Be certain that no sodium azide is present in the solutions used in this assay, as this inhibits HRP enzyme activity.***

*****The number of washes in the protocol was adapted to an automatic plate washer. This can be decreased when using other methods but should be tested empirically. Allowing time for soaking (~ 1 minute) during each wash step increases the effectiveness of the washes.***

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Quick Guide: Standard Calibration

The following table indicates the protein standard contained in the Ready-SET-Go! is calibrated against NIBSC standards.

Table of Standard Calibration

Cytokine	ng of eB standard	ng of NIBSC standard	U of NIBSC standard	NIBSC Lot #
hIL-2	1	1.1	14.6	86/564
hIL-4	1	2.2	22	88/656
hIL-5	1	2.2	22	90/586
hIL-6	1	1.7	170	89/548
hIL-8	1	1.8	180	89/520
hIL-10	1	0.8	4	93/722
hIL-12	1	0.8	8	95/544
hIL-17A	1	0.9	9000	01/420
hIFN-g	1	1.1	22	87/586
hTNF-a	1	0.9	36	87/650
mIL-2	1	3.1	310	93/566
mIL-4	1	3	30	91/656
mIL-6	1	8.5	850	93/730
mIFN-g*	1		4.5	Gg02-901-533
mTNF-a	1	1.7	340	88/532

* Mouse IFN-g is calibrated using NIH standard (Lot Gg02-901-533) and is measured in Units (U)

ELISA Troubleshooting Guide

Problem	Possibility	Solution
A. High background	1. Improper and inefficient washing	1. Improve efficiency of washing. Fill plates completely, soak for 1 minute per wash, as directed
	2. Cross contamination from other specimens or positive control	2. Repeat ELISA being careful when washing and pipetting
	3. Contaminated substrate	3. Substrate should be colorless. Replace
	4. Incorrect dilutions, e.g., conjugate concentration was too high	4. Repeat using correct dilutions
B. No signal	1. Improper, low protein binding capacity plates were used	1. Repeat ELISA using recommended high binding capacity plates
	2. Wrong substrate was used	2. Repeat ELISA using the correct substrate
	3. Enzyme inhibitor present in buffers; e.g., sodium azide in the washing buffer and Assay Diluent inhibits peroxidase activity	3. Repeat ELISA making no enzyme inhibitor is present in any buffers.

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	4. Coated capture antibody in Assay Diluent rather than Coating Buffer	4. Repeat ELISA using Coating Buffer contained in the set as the diluent for the capture antibody.
C. Very weak signal	1. Improper and inefficient washing	1. Make sure washing procedure is done correctly, with a soak time.
	2. Incorrect dilutions of standard	2. Follow recommendations of standard preparation exactly as written on the C of A
	3. Insufficient incubation time	3. Repeat ELISA following the protocol carefully for each step
	4. Incorrect storage of reagents	4. Store reagents at the correct temperature asn indicated on the Technical Data Sheet. Freezing certain components will severely impact results. Do not re-use the standards.
	5. Wrong filter in ELISA reader was used	5. Use the correct wavelength setting
	6. Wrong plate used	6. Use the recommended Corning Costar 9018 or NUNC Maxisorp flat bottom 96 well plates
D. Variation amongst replicates	1. Improper and inefficient washing	1. Make sure washing procedure is done correctly; see C of A. Edge effects can be avoided by moving samples and standards in from the edge of the plate.
	2. Poor mixing of samples	2. Mix samples and reagents gently and equilibrate to proper temperature
	3. Plates not clean	3. Plates should be wiped on bottom before measuring absorbance
	4. Reagents have expired	4. Order a new Ready-Set-Go ELISA.

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