# Human IL-13 ELISA Set

Instructions for use

| | | |
|---|---|---|
| Catalogue numbers: | 1x96 tests: | 851.630.001 |
| | 5x96 tests: | 851.630.005 |
| | 10x96 tests: | 851.630.010 |
| | 15x96 tests: | 851.630.015 |
| | 20x96 tests: | 851.630.020 |

## For research use only

*As a material condition to Diaclone providing its Products to Purchaser, Purchaser agrees that the end user shall not, directly or indirectly, attempt to reverse engineer, disassemble, or otherwise perform any compositional, structural, functional or other analyses directed to learning the methodology, components, formulae, processes, make-up, or production of any Product or any portion thereof.*

Fast Track Your Research…….

## Table of Contents


1. Intended Use ..... 2
2. Basic Principle of a Typical ELISA Method ..... 2
3. Reagents Provided and Reconstitution ..... 3
4. Materials Required but not Provided ..... 3
5. Storage Instructions ..... 4
6. Specimen Collection, Processing & Storage ..... 4
7. Safety & Precautions for Use ..... 5
8. Plate Preparation ..... 6
8.1. Capture Antibody ..... 6
8.2. Preparation Method ..... 6
9. Assay Preparation ..... 6
9.1. Assay Design ..... 6
9.2. Preparation of Standard ..... 7
9.3. Preparation of Sample ..... 7
9.4. Preparation of Biotinylated anti-IL-13 Detection Antibody ..... 7
9.5. Preparation of Streptavidin-HRP ..... 7
10. Method ..... 8
11. Data Analysis ..... 9
12. Assay Limitations ..... 9
13. Performance Characteristics ..... 9
13.1. Sensitivity ..... 9
14. Diaclone Human IL-13 ELISA Set References ..... 10

# Human IL-13 ELISA Set

## 1. Intended use

The Diaclone IL-13 ELISA Set is intended for use in a 'do it yourself' solid phase sandwich ELISA for the *in vitro* qualitative and quantitative determination of IL-13 in supernatants, buffered solutions, serum, plasma samples and other body fluids.

This assay will recognise both natural and recombinant human IL-13.

**This kit has been configured for research use only.**

## 2. Basic principle of a typical ELISA method

A capture antibody highly specific for IL-13 is coated to the wells a microtiter strip plate. Binding of IL-13 samples and known standards to the capture antibodies and subsequent binding of the biotinylated anti-IL-13 secondary antibody to the analyte is completed during the same incubation period. Any excess unbound analyte and secondary antibody is removed.
The HRP conjugate solution is then added to every well including the zero wells, following incubation excess conjugate is removed by careful washing.
A chromogen substrate is added to the wells resulting in the progressive development of a blue coloured complex with the conjugate. The colour development is then stopped by the addition of acid turning the resultant final product yellow. The intensity of the produced coloured complex is directly proportional to the concentration of IL-13 present in the samples and standards.
The absorbance of the colour complex is then measured and the generated OD values for each standard are plotted against expected concentration forming a standard curve. This standard curve can then be used to accurately determine the concentration of IL-13 in any sample tested.

## 3. Reagents provided and reconstitution

| **Reagents** (Store@2-8°C) | **Quantity 1x96 tests** | **Quantity 5x96 tests** | **Quantity 10x96 tests** | **Quantity 15x96 tests** | **Quantity 20x96 tests** | **Reconstitution** |
|---|---|---|---|---|---|---|
| IL-13 Standard: 100pg/ml | 1 vial | 5 vials | 10 vials | 15 vials | 20 vials | Reconstitute as directed on the vial (see Assay preparation, section 9) |
| Capture Antibody | 1 vial (0.1ml) | 1 vial (0.5ml) | 2 vials (0.5ml) | 3 vials (0.5ml) | 4 vials (0.5ml) | Sterile, dilute prior to use (see Plate preparation, section 8) |
| Biotinylated anti-IL-13 Detection Antibody | 1 vial (0.1ml) | 1 vial | 2 vials | 3 vials | 4 vials | Reconstitute with 0.55ml of reconstitution buffer prior to use (see Assay preparation, section 9) |
| Streptavidin-HRP | 1 vial (10µl) | 1 vial (25µl) | 2 vials (25µl) | 3 vials (25µl) | 4 vials (25µl) | Dilute prior to use (see Assay preparation, section 9) |
| TMB Substrate | 1 vial (10ml) | 2 vials (25ml) | 4 vials (25ml) | 6 vials (25ml) | 8 vials (25ml) | Ready to use |

## 4. Materials required but not provided

- 96-well Microtiter plates (e.g. Nunc Maxisorp Cat # 468667) *****
  *Note: the use of ELISA plates which are not high affinity binding will result in lower performances.*
- Reconstitution Buffer (PBS, 0.09% Azide) *****
- Coating Buffer (PBS, pH 7.2-7.4) *****
- Wash Buffer (PBS, 0.05% Tween20) *****
- Blocking Buffer (PBS, 5% BSA) *****
- Standard Dilution Buffer (PBS, 1% BSA) *****
- Secondary Antibody Dilution Buffer (PBS, 1% BSA) *****
  *Note: Supplementation with 10% Animal Serum (e.g. FCS) for assaying serum, plasma or other body fluids samples may be necessary.*
- HRP Dilution Buffer (PBS, 1% BSA, 0.1% Tween20) *****
- Stop Reagent (1N Sulfuric Acid) *****

***** Available in an Accessory Pack for ELISA Set, Diaclone product cat n°858.000.005, material for optimal performances and quantity provided for 5 plates.

- Microtiter plate reader with appropriate filters (450nm required with optional 630nm reference filter)
- Microplate washer or wash bottle
- 10, 50, 100, 200 and 1,000µl adjustable single channel micropipettes with disposable tips
- 50-300µl multi-channel micropipette with disposable tips
- Multichannel micropipette reagent reservoirs
- Distilled water
- Vortex mixer
- Miscellaneous laboratory plastic and/or glass, if possible sterile

## 5. Storage Instructions

Store kit reagents between 2 and 8°C. Immediately after use remaining reagents should be returned to cold storage (2-8°C). Expiry of the reagents is stated on box front labels. The expiry of the components can only be guaranteed if the components are stored properly, and if, in case of repeated use of one component, the reagent is not contaminated by the first handling.

**Reconstitution Buffer**: Once prepared store at 2-8°C for up to one week
**Coating Buffer**: Once prepared store at 2-8°C for up to one week
**Wash Buffer**: Once prepared store at 2-8°C for up to one week
**Blocking Buffer**: Once prepared store at 2-8°C for up to one week
**Standard Dilution Buffer**: Once prepared store at 2-8°C for up to one week
**Secondary Antibody Dilution Buffer**: Once prepared store at 2-8°C for up to one week
**HRP Dilution Buffer**: Once prepared store at 2-8°C for up to one week
**Stop Reagent:** Once prepared store at RT for up to one week

**Reconstituted Biotinylated anti IL-13 Detection Antibody:** Once prepared store at 2-8°C for up to one year
**Reconstituted IL-13 Standard:** Once prepared use immediately and discard after use

## 6. Specimen collection, processing & storage

Cell culture supernatants, human serum, plasma or other biological samples will be suitable for use in the assay. Remove serum from the clot or red cells, respectively, as soon as possible after clotting and separation.

**Cell culture supernatants**: Remove particulates and aggregates by spinning at approximately 1000 x g for 10 min.

**Serum:** Use pyrogen/endotoxin free collecting tubes. Serum should be removed rapidly and carefully from the red cells after clotting. Following clotting, centrifuge at approximately 1000 x g for 10 min and remove serum.

**Plasma:** EDTA, citrate and heparin plasma can be assayed. Spin samples at 1000 x g for 30 min to remove particulates. Harvest plasma.

**Storage**: If not analyzed shortly after collection, samples should be aliquoted (250-500µl) to avoid repeated freeze-thaw cycles and stored frozen at –70°C. Avoid multiple freeze-thaw cycles of frozen specimens.

**Recommendation:** Do not thaw by heating at 37°C or 56°C. Thaw at room temperature and make sure that sample is completely thawed and homogeneous before use. When possible avoid use of badly haemolysed or lipemic sera. If large amounts of particles are present these should be removed prior to use by centrifugation or filtration.

## 7. Safety & precautions for use

- Handling of reagents, serum or plasma specimens should be in accordance with local safety procedures, e.g.CDC/NIH Health manual : " Biosafety in Microbiological and Biomedical Laboratories" 1984
- Avoid any skin contact with $H_2SO_4$ and TMB. In case of contact, wash thoroughly with water
- Do not eat, drink, smoke or apply cosmetics where kit reagents are used
- Do not pipette by mouth
- When not in use, kit components should be stored refrigerated or frozen as indicated on vials or bottles labels
- All reagents should be warmed to room temperature before use. Lyophilized standards should be discarded after use
- Cover or cap all reagents when not in use
- Do not mix or interchange reagents between different lots
- Do not use reagents beyond the expiration date of the kit
- Use a clean disposable plastic pipette tip for each reagent, standard, or specimen addition in order to avoid cross contamination, for the dispensing of $H_2SO_4$ and substrate solution, avoid pipettes with metal parts
- Use a clean plastic container to prepare the washing solution
- Thoroughly mix the reagents and samples before use by agitation or swirling
- All residual washing liquid must be drained from the wells by efficient aspiration or by decantation followed by tapping the plate forcefully on absorbent paper. Never insert absorbent paper directly into the wells
- The TMB solution is light sensitive. Avoid prolonged exposure to light. Also, avoid contact of the TMB solution with metal to prevent colour development. Warning TMB is toxic avoid direct contact with hands. Dispose off properly
- If a dark blue colour develops within a few minutes after preparation, this indicates that the TMB solution has been contaminated and must be discarded. Read absorbance's within 1 hour after completion of the assay
- When pipetting reagents, maintain a consistent order of addition from well-to-well. This will ensure equal incubation times for all wells
- Follow incubation times described in the assay procedure
- Dispense the TMB solution within 15 min of the washing of the microtiter plate

# 8. Plate Preparation

## 8.1. Capture Antibody

It is recommended to centrifuge vial for a few seconds in a microcentrifuge to collect all the volume at the bottom. This reagent is supplied sterile, once opened keep the vial sterile for optimal performance.

For one plate, add 100µl of Capture Antibody into 10ml of Coating Buffer.

## 8.2. Preparation method

| | | |
|---|---|---|
| 1. | Addition | Add 100µl of diluted **Capture Antibody** to every well |
| 2. | Incubation | Cover with a plastic plate cover and incubate at 4°C **overnight** |
| 3. | Wash | Remove the cover and wash the plate as follows:<br>a) Aspirate the liquid from each well<br>b) Dispense 0.3 ml of **washing solution** into each well<br>c) Aspirate the contents of each well<br>d) Repeat step b and c |
| 4. | Addition | Add 100µl of **Blocking Buffer** to every well |
| 5. | Incubation | Cover with a plastic plate cover and incubate at room temperature (18 to 25°C) for **2 hour(s)** |
| 6. | Wash | Remove the cover and wash the plate as follows:<br>a) Aspirate the liquid from each well<br>b) Dispense 0.3 ml of **washing solution** into each well<br>c) Aspirate the contents of each well<br>d) Repeat step b and c another 2 times |
| For Immediate use of the plate(s) continue to section 9.<br><br>If you wish to store the coated and blocked plates for future use, bench dry each plate at room temperature (18 to 25°C) for 24 hours. Then store at 2-8°C in a sealed plastic bag with desiccant for up to 12months. | | |

# 9. Assay Preparation

**Bring all reagents to room temperature before use**

## 9.1. Assay Design

Determine the number of microwell strips required to test the desired number of samples plus appropriate number of wells needed for running zeros and standards. Each sample, standard and zero should be tested **in duplicate**.

**Example plate layout** (example shown for a 6 point standard curve)

| | Standards | | Sample Wells | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| A | 100 | 100 | | | | | | | | | | |
| B | 50 | 50 | | | | | | | | | | |
| C | 25 | 25 | | | | | | | | | | |
| D | 12.5 | 12.5 | | | | | | | | | | |
| E | 6.25 | 6.25 | | | | | | | | | | |
| F | 3.125 | 3.125 | | | | | | | | | | |
| G | zero | zero | | | | | | | | | | |
| H | | | | | | | | | | | | |

*All remaining empty wells can be used to test samples in duplicate*

## 9.2. Preparation of Standard

Standard vials must be reconstituted with the volume of Standard Dilution Buffer shown on the vial immediately prior to use. This reconstitution gives a stock solution of 100pg/ml of IL-13. **Mix the reconstituted Standard gently by inversion only**. Serial dilutions of the Standard are made directly in the assay plate to provide the concentration range from 100 to 3.125pg/ml. A fresh Standard curve should be produced for each new assay.

- Immediately after reconstitution add 200µl of the reconstituted Standard to wells A1 and A2, which provides the highest concentration Standard at 100pg/ml
- Add 100µl of Standard Dilution Buffer to the remaining Standard wells B1 and B2 to F1 and F2
- Transfer 100µl from wells A1 and A2 to B1 and B2. Mix the well contents by repeated aspirations and ejections taking care not to scratch the inner surface of the wells
- Continue this 1:1 dilution using 100µl from wells B1 and B2 through to wells F1 and F2 providing a serial diluted Standard curve ranging from 100pg/ml to 3.125pg/ml
- Discard 100µl from the final wells of the Standard curve (F1 and F2)

Alternatively these dilutions can be performed in separate clean tubes and immediately transferred directly into the relevant wells.

## 9.3. Preparation of Sample

If necessary, dilute the Samples in the Standard Dilution Buffer.

## 9.4. Preparation of Biotinylated anti-IL-13 Detection Antibody

For the first experiment, the lyophilised Detection Antibody vial must be reconstituted with 0.55ml of Reconstitution Buffer prior to use. Gently mix the solution and wait until all the lyophilised material is back into solution.

It is recommended this reagent is prepared **immediately before use**. Dilute the reconstituted biotinylated anti-IL-13 with the Secondary Antibody Dilution Buffer in an appropriate clean glass vial.

For one plate, add 100µl of the reconstituted Detection Antibody into 5ml of Secondary Antibody Dilution buffer.

Please note for 1 x 96 tests, Biotinylated Detection Antibody is provided in liquid form.

## 9.5. Preparation of Streptavidin-HRP

It is recommended to centrifuge vial for a few seconds in a microcentrifuge to collect all the volume at the bottom.

Dilute 5µl of Streptavidin-HRP into 0.5ml of HRP Dilution Buffer **immediately before use.**
Take 150µl of the diluted HRP solution into 10ml of HRP Dilution Buffer.

Do-not keep these solutions for future experiments.

# 10. Method

**We strongly recommend that every vial is mixed thoroughly without foaming prior to use except the standard vial which must be mixed gently by inversion only.**

**Note**: Final preparation of Biotinylated anti-IL-13 (section 9.4) and Streptavidin-HRP (section 9.5) should occur immediately before use.

| Assay Step | | Details |
|---|---|---|
| 1 | Preparation | **Prepare Standard curve** as shown in Section 9.2 |
| 2 | Addition | Add 100µl of each **Standard, Sample, zero** (Standard Dilution Buffer) to appropriate wells in duplicate |
| 3 | Addition | Add 50µl of diluted **Detection Antibody** into all wells |
| 4 | Incubation | Cover with a plastic plate cover and incubate at room temperature (18 to 25°C) for **1 hour 30 mins** |
| 5 | Wash | Remove the cover and wash the plate as follows:<br>a) Aspirate the liquid from each well<br>b) Dispense 0.3 ml of **washing solution** into each well<br>c) Aspirate the contents of each well<br>d) Repeat step b and c |
| 6 | Addition | Add 100µl of **Streptavidin-HRP** solution into all wells |
| 7 | Incubation | Cover with a plastic plate cover and incubate at room temperature (18 to 25°C) for **30 minutes** |
| 8 | Wash | Repeat wash step 5 |
| 9 | Addition | Add 100µl of ready-to-use **TMB Substrate Solution** into all wells |
| 10 | Incubation | Incubate in the dark for **5-15 minutes*** at room temperature. Avoid direct exposure to light by wrapping the plate in aluminium foil |
| 11 | Addition | Add 100µl of **Stop Reagent** into all wells |
| **Read the absorbance** value of each well (immediately after step 11) on a spectrophotometer using 450 nm as the primary wavelength and optionally 630 nm as the reference wave length (610 nm to 650 nm is acceptable). | | |

***Incubation time of the substrate solution is usually determined by the ELISA reader performance. Many ELISA readers only record absorbance up to 2.0 O.D. Therefore the colour development within individual microwells must be observed by the analyst, and the substrate reaction stopped before positive wells are no longer within recordable range.*

# 11. Data Analysis

Calculate the average absorbance values for each set of duplicate standards and samples**.** Ideally duplicates should be within 20% of the mean.

Generate a linear standard curve by plotting the average absorbance of each standard on the vertical axis versus the corresponding IL-13 standard concentration on the horizontal axis.

The amount of IL-13 in each sample is determined by extrapolating OD values against IL-13 standard concentrations using the standard curve**.**

# 12. Assay limitations

Do not extrapolate the standard curve beyond the maximum standard curve point. The dose-response is non-linear in this region and good accuracy is difficult to obtain. Concentrated samples above the maximum standard concentration must be diluted with standard dilution buffer or with your own sample buffer to produce an OD value within the range of the standard curve. Following analysis of such samples always multiply results by the appropriate dilution factor to produce actual final concentration.

The influence of various drugs on end results has not been investigated. Bacterial or fungal contamination and laboratory cross-contamination may also cause irregular results.

Improper or insufficient washing at any stage of the procedure will result in either false positive or false negative results. Completely empty wells before dispensing fresh Washing Buffer, fill with Washing Buffer as indicated for each wash cycle and do not allow wells to sit uncovered or dry for extended periods.

Disposable pipette tips, flasks or glassware are preferred, reusable glassware must be washed and thoroughly rinsed of all detergents before use.

As with most biological assays conditions may vary from assay to assay therefore **a fresh standard curve must be prepared and run for every assay.**

# 13. Performance Characteristics

## 13.1. Sensitivity

The sensitivity, minimum detectable dose of this IL-13 antibody pair was determined using the Diaclone IL-13 ELISA kit (which contains the same antibodies) and was found to be **<1.5pg/ml**. This was determined by adding 3 standard deviations to the mean OD obtained when the zero standard was assayed 32 times.

## 14. Diaclone Human IL-13 ELISA Set References


1- Arnaud, V. et al., J Infect Dis.,2008;198(3): 418-26
2- Bredo, G. et al.,Immun Inflamm Dis.,2015; 3(4): 455-68
3- Ghannam, S. et al., J. Immunol.,2010; 185(1): 302-312
4- Malmstrom, K. et al.,Clin Transl Allergy ,2014;4:35
5- Ochensberger, B. et al., Blood,1996; 88(8): 3028-37
6- Ota M. O. C. et al., J Trop Pediatr, 2006; 52(2):136-40
7- Ota M. O. C. et al., J. Immunol., 2002; 168(2) : 919 – 925
8- Pecaric-Petkovic, T. et al., Blood,2009; 113(7): 1526-1534
9- Schramm G. et al., J. Biol. Chem., 2003; 278(20): 18384 – 18392
10- Tschopp, C. M. et al., Blood,2006; 108(7): 2290-9
11- Vekemans J. et al., Infect. Immun., 2004; 72(1): 381 - 388

## Products Manufactured and Distributed by:

**Diaclone SAS**
**6 Rue Docteur Jean-François-Xavier Girod**
**BP 1985**
**25020 Besançon Cedex**
**France**
**Tel +33 (0)3 81 41 38 38**
**Fax +33 (0)3 81 41 36 36**
**Email: info@diaclone.com**
**www.diaclone.com**