

### Human Cardiotrophin-1 ELISA Kit

#### Preparation

- **Plate Washing**

Discard the solution in the plate without touching the side walls. Blot the plate onto paper towels or other absorbent material. Soak each well with at least 0.3 ml PBS or TBS buffer for 1~2 minutes. Repeat this process two additional times for a total of THREE washes.

**Note:** For automated washing, aspirate all wells and wash THREE times with PBS or TBS buffer, overfilling wells with PBS or TBS buffer. Blot the plate onto paper towels or other absorbent material.

- **Sample Preparation and Storage**

Store samples to be assayed within 24 hours at 2-8°C. For long-term storage, aliquot and freeze samples at -20°C. Avoid repeated freeze-thaw cycles.

- **Cell culture supernate, tissue lysate or body fluids:** Remove particulates by centrifugation, analyze immediately or aliquot and store at -20°C
- **Serum:** Allow the serum to clot in a serum separator tube (about 30 min) at room temperature. Centrifuge at approximately 1000 X g for 15 min. Analyze the serum immediately or aliquot and store frozen at -20°C.

- **Sample Dilution Guideline**

The user needs to estimate the concentration of the target protein in the sample and select a proper dilution factor so that the diluted target protein concentration falls near the middle of the linear regime in the standard curve. Dilute the sample using the provided diluent buffer. The following is a guideline for sample dilution. Several trials may be necessary in practice. **The sample must be well mixed with the diluents buffer.**

- **High target protein concentration (20-200ng/ml).** The working dilution is 1:100. i.e. Add 1 µl sample into 99 µl sample diluent buffer.
- **Medium target protein concentration (2-20ng/ml).** The working dilution is 1:10. i.e. Add 10 µl sample into 90 µl sample diluent buffer.
- **Low target protein concentration (31.2-2000pg/ml).** The working dilution is 1:2. i.e. Add 50 µl sample to 50 µl sample diluent buffer.
- **Very Low target protein concentration (≤31.2pg/ml).** No dilution necessary, or the working dilution is 1:2.

- **Reagent Preparation and Storage**

A. Reconstitution of the human Cardiotrophin-1 standard: Cardiotrophin-1 standard solution should be prepared no more than 2 hours prior to the experiment. Two tubes of Cardiotrophin-1 standard (10ng per tube) are included in each kit. Use one tube for each experiment.

- 10,000pg/ml of human Cardiotrophin-1 standard solution: Add 1 ml sample diluent buffer into one tube, keep the tube at room temperature for 10 min and mix thoroughly.
- 2000pg/ml of human Cardiotrophin-1 standard solution: Add 0.2 ml of the above 10ng/ml Cardiotrophin-1 standard solution into 0.8 ml sample diluent buffer and mix thoroughly.
- 1000pg/ml→31.2pg/ml of human Cardiotrophin-1 standard solutions: Label 6 Eppendorf tubes with 1000pg/ml, 500pg/ml, 250pg/ml, 125pg/ml, 62.5pg/ml, 31.2pg/ml, respectively. Aliquot 0.3 ml of the sample diluent buffer into each tube. Add 0.3 ml of the above 2000pg/ml Cardiotrophin-1 standard

## Protocol for ELISA Kit

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solution into 1st tube and mix. Transfer 0.3 ml from 1st tube to 2nd tube and mix. Transfer 0.3 ml from 2nd tube to 3rd tube and mix, and so on.

**Note:** The standard solutions are best used within 2 hours. The 10 ng/ml standard solution may be stored at 4°C for up to 12 hours, or at -20°C for up to 48 hours. Avoid repeated freeze-thaw cycles.

- B. Preparation of biotinylated anti-human Cardiotrophin-1 antibody working solution: The solution should be prepared no more than 2 hours prior to the experiment.
- The total volume should be: 0.1ml/well x (the number of wells). (Allowing 0.1-0.2 ml more than total volume)
  - Biotinylated anti-human Cardiotrophin-1 antibody should be diluted in 1:99 with the antibody diluent buffer and mixed thoroughly.
- C. Preparation of Avidin-Biotin-Peroxidase Complex (ABC) working solution: The solution should be prepared no more than 1 hour prior to the experiment.
- The total volume should be: 0.1ml/well x (the number of wells). (Allowing 0.1-0.2 ml more than total volume)
  - Avidin- Biotin-Peroxidase Complex (ABC) should be diluted in 1:99 with the ABC dilution buffer and mixed thoroughly.

### **Assay Procedure**

The ABC working solution and TMB color developing agent must be kept warm at 37°C for 30 min before use. When diluting samples and reagents, they must be mixed completely and evenly. Standard Cardiotrophin-1 detection curve should be prepared for each experiment. The user will decide sample dilution fold by crude estimation of Cardiotrophin-1 amount in samples.

- Aliquot 0.1ml per well of the 2000pg/ml, 1000pg/ml, 500pg/ml, 250pg/ml, 125pg/ml, 62.5pg/ml, 31.2pg/ml human Cardiotrophin-1 standard solutions into the precoated 96-well plate. Add 0.1ml of the sample diluent buffer into the control well (Zero well). Add 0.1ml of each properly diluted sample of rat sera, plasma, body fluids, tissue lysates or cell culture supernatants to each empty well. **See “Sample Dilution Guideline” above for details.** We recommend that each human Cardiotrophin-1 standard solution and each sample is measured in duplicate.
- Seal the plate with the cover and incubate at 37°C for 90 min.
- Remove the cover, discard plate content, and blot the plate onto paper towels or other absorbent material. Do NOT let the wells completely dry at any time.
- Add 0.1ml of biotinylated anti-human Cardiotrophin-1 antibody working solution into each well and incubate the plate at 37°C for 60 min.
- Wash the plate three times with 0.01M TBS or 0.01M PBS, and each time let washing buffer stay in the wells for 1 min. Discard the washing buffer and blot the plate onto paper towels or other absorbent material.
- Add 0.1ml of prepared ABC working solution into each well and incubate the plate at 37°C for 30 min.
- Wash plate 5 times with 0.01M TBS or 0.01M PBS, and each time let washing buffer stay in the wells for 1-2 min. Discard the washing buffer and blot the plate onto paper towels or other absorbent material.
- Add 90 µl of prepared TMB color developing agent into each well and incubate plate at 37°C for 20-25 min (shades of blue can be seen in the wells with the four most concentrated human Cardiotrophin-1 standard solutions; the other wells show no obvious color).
- Add 0.1ml of prepared TMB stop solution into each well. The color changes into yellow immediately.
- Read the O.D. absorbance at 450nm in a microplate reader within 30 min after adding the stop solution.

**FOR RESEARCH USE ONLY. NOT FOR DIAGNOSTIC AND CLINICAL USE.**

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For calculation, (the relative O.D.<sub>450</sub>) = (the O.D.<sub>450</sub> of each well) – (the O.D.<sub>450</sub> of Zero well). The standard curve can be plotted as the relative O.D.<sub>450</sub> of each standard solution (Y) vs. the respective concentration of the standard solution (X). The human Cardiotrophin-1 concentration of the samples can be interpolated from the standard curve.

**Note:** if the samples measured were diluted, multiply the dilution factor to the concentrations from interpolation to obtain the concentration before dilution.

### Summary

1. Add samples and standards and incubate the plate at 37°C for 90 min. Do not wash.
2. Add biotinylated antibodies and incubate the plate at 37°C for 60 min. Wash plate 3 times with 0.01M TBS.
3. Add ABC working solution and incubate the plate at 37°C for 30 min. Wash plate 5 times with 0.01M TBS.
4. Add TMB color developing agent and incubate the plate at 37°C for 20-25 min.
5. Add TMB stop solution and read.

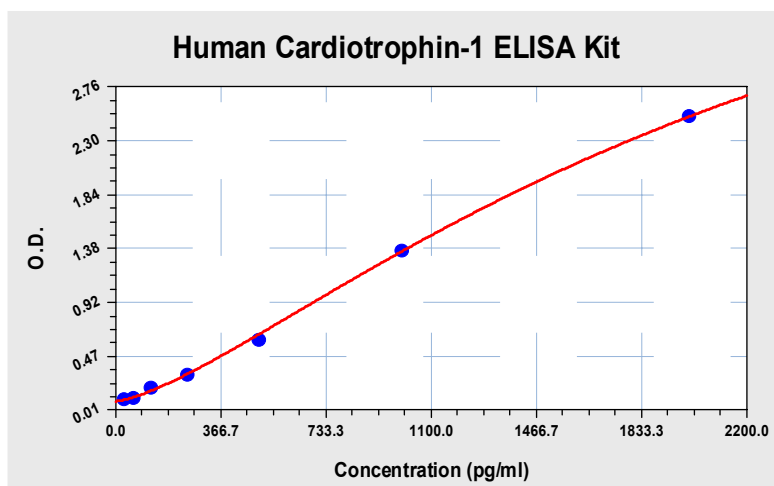
### Typical Data Obtained from Human Cardiotrophin-1

(TMB reaction incubate at 37°C for 21 min)

Concentration	0.0pg/ml	31.2pg/ml	62.5pg/ml	125pg/ml	250pg/ml	500pg/ml	1000pg/ml	2000pg/ml
O.D	0.066	0.104	0.115	0.204	0.305	0.608	1.366	2.513

### Typical Human Cardiotrophin-1 ELISA Kit Standard Curve

This standard curve was generated at GenWay for demonstration purpose only. A standard curve must be run with each assay.



## Human Cardiotrophin-1 ELISA Kit

**Catalog No.** NB-06-1074

**Size** 96T

**Range** 31.2pg/ml-2000pg/ml

**Sensitivity** < 10pg/ml

### **Specificity**

No detectable cross-reactivity with any other cytokine.

### **Storage**

Store at 4°C for frequent use, at -20°C for infrequent use.

Avoid multiple freeze-thaw cycles (Shipped with wet ice.)

### **Expiration**

Two months at 4°C and four months at -20°C.

### **Application**

For quantitative detection of human CT-1 in sera, body fluids, tissue lysates or cell culture supernates.

### **Principle**

Neo Biotech's human CT-1 ELISA Kit was based on standard sandwich enzyme-linked immune-sorbent assay technology. Human CT-1 specific-specific polyclonal antibodies were precoated onto 96-well plates. The human specific detection polyclonal antibodies were biotinylated. The test samples and biotinylated detection antibodies were added to the wells subsequently and then followed by washing with PBS or TBS buffer. Avidin-Biotin-Peroxidase Complex was added and unbound conjugates were washed away with PBS or TBS buffer. HRP substrate TMB was used to visualize HRP enzymatic reaction. TMB was catalyzed by HRP to produce a blue color product that changed into yellow after adding acidic stop solution. The density of yellow is proportional to the human CT-1 amount of sample captured in plate.

### **Kit Components**

1. Lyophilized recombinant human CT-1 standard: 10ng/tube×2.
2. One 96-well plate precoated with anti- human CT-1 antibody.
3. Sample diluent buffer: 30 ml
4. Biotinylated anti- human CT-1 antibody : 130µl, dilution 1:100.
5. Antibody diluent buffer: 12ml.
6. Avidin-Biotin-Peroxidase Complex (ABC): 130µl, dilution 1:100.
7. ABC diluent buffer: 12ml.
8. TMB color developing agent: 10ml.
9. TMB stop solution: 10ml.

### **Material Required But Not Provided**

1. Microplate reader in standard size.
2. Automated plate washer.
3. Adjustable pipettes and pipette tips. Multichannel pipettes are recommended in the condition of large amount of samples in the detection.
4. Clean tubes and Eppendorf tubes.
5. Washing buffer (neutral PBS or TBS).

Preparation of 0.01M **TBS**: Add 1.2g Tris, 8.5g NaCl; 450µl of purified acetic acid or 700µl of concentrated hydrochloric acid to 1000ml H<sub>2</sub>O and adjust pH to 7.2-7.6. Finally, adjust the total volume to 1L.

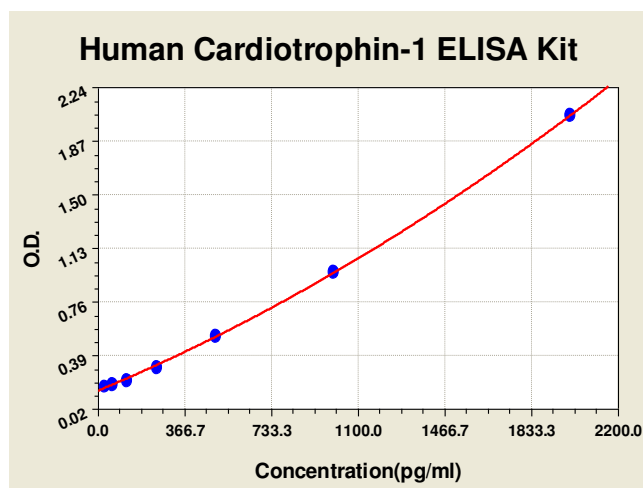
Preparation of 0.01 M **PBS**: Add 8.5g sodium chloride, 1.4g Na<sub>2</sub>HPO<sub>4</sub> and 0.2g NaH<sub>2</sub>PO<sub>4</sub> to 1000ml distilled water and adjust pH to 7.2-7.6. Finally, adjust the total volume to 1L.

## Product Information Sheet

### Notice for Application of Kit

1. Before using Kit, spin tubes and bring down all components to bottom of tube.
2. Duplicate well assay was recommended for both standard and sample testing.
3. Don't let 96-well plate dry, dry plate will inactivate active components on plate.
4. In order to avoid marginal effect of plate incubation due to temperature difference ( reaction may be stronger in the marginal wells), it is suggested that the diluted ABC and TMB solution will be pre-warmed in 37°C for 30 min before using.

### Human CT-1 ELISA Kit-1X96 Well Plate Image



### Background

Cardiotrophin-1 (CT-1) is a member of the family of cytokines that includes leukemia inhibitory factor (LIF), ciliary neurotrophic factor (CNTF), oncostatin M (OSM), interleukin-6 (IL6), and interleukin-11 (IL11). And the CT-1 gene is mapped to 1p21-p13. The human CT-1 protein contains 201 amino acids and shares 80% amino acid identity with the 203-amino acid mouse CT-1 sequence; however, unlike the mouse protein, human CT-1 has 2 rather than 1 cys and has no N-glycosylation site<sup>1</sup>. Despite lacking a signal sequence, secreted CT-1 and mouse CT-1 induce cardiac myocyte hypertrophy in cell culture and bind to both mouse and human LIFR but not to OSMR. Furthermore, A 1.7-kb CT-1 transcript was detected at high levels in heart, skeletal muscle, prostate, and ovary. Low levels were detected in lung, kidney, pancreas, thymus, testis, and small intestine, with little or no expression detected in brain, placenta, spleen, colon, and peripheral blood leukocytes. And it was also observed strong expression in fetal lung and kidney<sup>1</sup>.

### Reference

1. Pennica, D.; Swanson, T. A.; Shaw, K. J.; Kuang, W.-J.; Gray, C. L.; Beatty, B. G.; Wood, W. I. : Human cardiotrophin-1: protein and gene structure, biological and binding activities, and chromosomal localization. *Cytokine* 8: 183-189, 1996.