



Sino Biological
Biological Solution Specialist

Human TrkA / NTRK1 ELISA Pair Set

Catalog Number : SEK11073
Lot Number: KW17MY1901

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

TRKA is a member of the neurotrophic tyrosine kinase receptor (NTRK) family. It is a membrane-bound receptor that, upon neurotrophin binding, phosphorylates itself and members of the MAPK pathway. Isoform TrkA-III promotes angiogenesis and has oncogenic activity when overexpressed. Isoform TrkA-I is found in most non-neuronal tissues. Isoform TrkA-II is primarily expressed in neuronal cells. TrkA-III is specifically expressed by the pluripotent neural stem and neural crest progenitors. The presence of NTRK1 leads to cell differentiation and may play a role in specifying sensory neuron subtypes. Mutations in the TRKA gene have been associated with congenital insensitivity to pain, anhidrosis, self-mutilating behavior, mental retardation, and cancer. It was originally identified as an oncogene as it is commonly mutated in cancers, particularly colon and thyroid carcinomas. TRKA is required for high-affinity binding to nerve growth factor (NGF), neurotrophin-3 and neurotrophin-4/5 but not brain-derived neurotrophic factor (BDNF). Known substrates for the Trk receptors are SHC1, PI 3-kinase, and PLC-gamma-1. NTRK1 has a crucial role in the development and function of the nociceptive reception system as well as the establishment of thermal regulation via sweating. It also activates ERK1 by either SHC1- or PLC-gamma-1-dependent signaling pathway. Defects in NTRK1 are a cause of congenital insensitivity to pain with anhidrosis and thyroid papillary carcinoma.

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 TrkA / NTRK1 coated on a 96-well plate. Standards and samples are added to the wells, and any Human TrkA / NTRK1 present binds to the immobilized antibody. The wells are washed and a horseradish peroxidase conjugated rabbit anti-Human TrkA / NTRK1 polyclonal 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 TrkA / NTRK1 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 TrkA / NTRK1 ELISA Pair Set is for the quantitative determination of Human TrkA / NTRK1.
- ◆ 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 mouse anti-Human TrkA / NTRK1 monoclonal antibody (in PBS, pH 7.4). Dilute to a working concentration of 2 µg/mL in PBS before coating. (Catalog: # 11073-MM02)

Detection Antibody – 0.2 mg/mL of rabbit anti-Human TrkA / NTRK1 polyclonal antibody conjugated to horseradish-peroxidase (HRP) (in PBS, 50 % HRP-Protector, pH 7.4, store at 4°C). Dilute to working concentration of 0.8 µg/mL in dilution buffer before use.

Standard – Each vial contains 240 ng of recombinant Human TrkA / NTRK1. Reconstitute with 1 mL 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 dilution buffer, and a high standard of 10000 pg/mL is recommended.

Standard reconstitution tips: Add dilution buffer, gently mix it up and down 3~5 times. Avoid violent and long-time shock.

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

Wash Buffer - 0.05% Tween20 in PBS, pH 7.2 - 7.4

Blocking Buffer - 2% BSA in Wash Buffer

Dilution Buffer - 0.1% 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 100 μ L 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 300 μ L 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 μ L 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

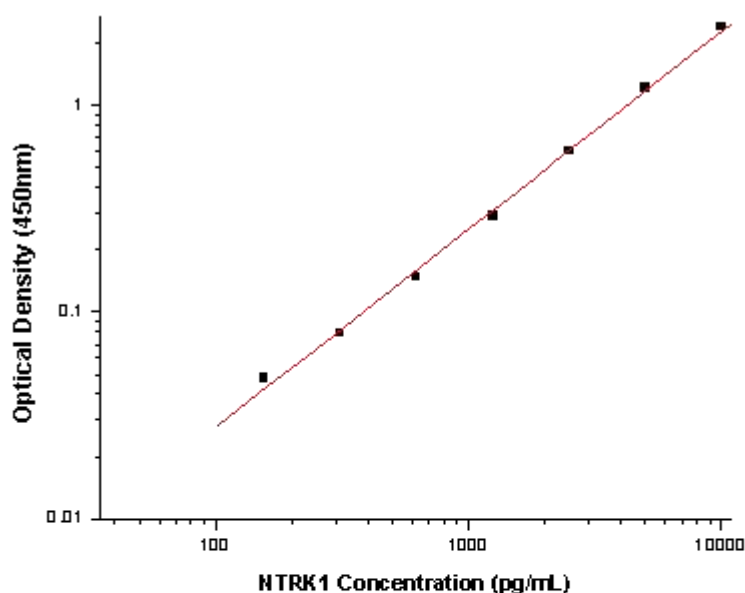
1. Add 100 μ L of sample or standards in Dilution Buffer per well. Seal the plate and incubate 2 hours at room temperature.
2. Repeat the aspiration/wash as in step 2 of plate preparation.
3. Add 100 μ L of the detection antibody, diluted in Dilution Buffer, to each well. Seal the plate and incubate 1 hour at room temperature.
4. Repeat the aspiration/wash as in step 2 of plate preparation.
5. Add 200 μ L 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 μ L 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.



| Concentration (pg/mL) | Zero standard subtracted OD |
|------------------------|-----------------------------|
| 0 | 0 |
| 156.25 | 0.048 |
| 312.5 | 0.079 |
| 625 | 0.148 |
| 1250 | 0.293 |
| 2500 | 0.602 |
| 5000 | 1.214 |
| 10000 | 2.413 |

PERFORMANCE CHARACTERISTIC

SENSITIVITY

The minimum detectable dose of Human TrkA / NTRK1 was determined to be approximately 156.25 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

| 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 |
| | 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 |
| | TMB Substrate Solution was contaminated | TMB Substrate Solution should be clear and colorless prior to addition to wells |
| | Materials were contaminated. | 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 |

| ELISA Plate Template | | | | | | | | | | | | |
|----------------------|---|---|---|---|---|---|---|---|---|----|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| A | | | | | | | | | | | | |
| B | | | | | | | | | | | | |
| C | | | | | | | | | | | | |
| D | | | | | | | | | | | | |
| E | | | | | | | | | | | | |
| F | | | | | | | | | | | | |
| G | | | | | | | | | | | | |
| H | | | | | | | | | | | | |

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Notes