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EZ-Set™ ELISA Kit (DIY Antibody Pairs)

Catalog number: EZ0307

For the development of sandwich ELISA kit to measure **Human BDNF** concentrations in cell culture supernatants, cell lysates, serum and plasma (heparin, EDTA, citrate).

This package insert must be read in its entirety before using this product.
For research use only. Not for use in diagnostic procedures.

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Human BDNF EZ-Set™ ELISA Kit (DIY Antibody Pairs)

Catalog Number: EZ0307

For the development of sandwich ELISA kit to measure Human BDNF in cell culture supernatants, cell lysates, serum and plasma (heparin, EDTA, citrate).

This kit contains sufficient materials to run ELISAs on at least five 96 well plates, provided the following conditions are met:
- **The reagents are prepared as described in this package insert.**
- **The assay is run as described in the General ELISA Protocol.**
- **The recommended microplates, buffers, diluents, substrates, and solutions are used.**

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Overview

Size	5 plates/kit
Range	31.2 pg/ml - 2,000 pg/ml
Specificity	Natural and recombinant Human BDNF
Immunogen	Expression system for standard: NS0; Immunogen sequence: H129-R247
Cross Reactivity	There is no detectable cross-reactivity with other relevant proteins.
Storage Instructions	Store at 4°C for 6 months, at -20°C for 12 months. Avoid multiple freeze-thaw cycles (Ships with gel ice, can store for up to 3 days in room temperature. Freeze upon receiving.)

Kit Components/Materials Provided

Catalog number	Description	Quantity	Storage of opened/reconstituted material
EZ0307-CA	Mouse anti-human BDNF polyclonal antibody (Capture Antibody)	500 µl, 4 µg/mL (recommended dilution 1:100)	Store undiluted at 4°C for 1 month or at -20°C for 3 months provided this is within the expiration date of the kit.
EZ0307-DA	Biotinylated mouse anti-human BDNF polyclonal antibody (Detection Antibody)	500 µl (recommended dilution 1:100)	
AR1103	Avidin-Biotin-Peroxidase Complex (ABC)	500 µl (recommended dilution 1:100)	

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EZ0307-ST	Lyophilized recombinant human BDNF standard	10 ng/tube×3	Discard the standard stock solution after 12 hours at 4°C. May be stored at -20°C for 48 hours provided this is within the expiration date of the kit.

Other Materials & Solutions 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. 96 well microplate (Cat# AR1100)
- 6. Plate Sealers
- 7. Capture Antibody Diluent: 100 mL H2O, 0.5 g Na2HPO4.
- 8. Reagent Diluent: 1% BSA in PBS, pH 7.2-7.4, 0.2 m filtered.
- 9. Substrate Solution: Tetramethylbenzidine (Cat# AR1104)
- 10. Stop Solution: 2 N H2SO4 (Cat# AR1105)
- 11. Wash Buffer (neutral PBS or TBS).
  Preparation of 0.01M TBS: Add 1.2 g Tris, 8.5 g Nacl; 450 L of purified acetic acid or 700 L of concentrated hydrochloric acid to 1000 mL H2O and adjust pH to 7.2-7.6. Finally, adjust the total volume to 1 L.
  Preparation of 0.01M PBS: Add 8.5 g sodium chloride, 1.4 g Na2HPO4 and 0.2 g NaH2PO4 to 1000 mL distilled water and adjust pH to 7.2-7.6. Finally, adjust the total volume to 1L.

*The EZ Set Accessory Kit (EZA001) provides an easy way to get all the reagents you need for performing an ELISA assay. The components included in the EZ Set Accessory Kit can also be substituted with products other companies if it is of convenience to you.

Preparation

Bring all reagents to room temperature before use. Working dilutions should be prepared and used immediately.

1. Plate Preparation

1) Dilute the Capture Antibody to the working concentration in 1:100 with Capture Antibody Diluent.(i.e. Add 1 µl anti-Human BDNF Capture Antibody into 99 µl Capture Antibody Diluent.) Immediately coat a 96-well microplate with 100 µl per well of the diluted Capture Antibody. Seal the plate and incubate overnight at 4°C.

2) Remove the cover and discard the liquid in the wells into an appropriate waste receptacle. Invert the plate on the benchtop onto a paper towel and tap the plate to gently blot any remaining liquid. It is recommended that the wells are not allowed to completely dry at any time.

3) Block plates by adding 200 µl of Reagent Diluent to each well. Incubate at room temperature for 2 hours.

4) Aspirate each well and wash with **PBS**, repeating the process two times for a total of three washes. Wash by filling each well with **PBS** (300-350 µl) using a squirt bottle, manifold dispenser, or autowasher. Complete removal of liquid at each step is essential for good performance. After the last wash, remove any remaining **PBS** by aspirating or by inverting the plate and blotting it against clean paper towels.**(Plate Washing Method)**

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2. Reconstitution of Human BDNF standard

1) It is recommended that the standards be prepared no more than 2 hours prior to performing the experiment. Use one 10 ng of lyophilized human BDNF standard for each experiment. Gently spin the vial prior to use. Reconstitute the standard to a stock concentration of 10 ng/ml using 1 ml of Reagent Diluent. Allow the standard to sit for a minimum of 10 minutes with gentle agitation prior to making dilutions.

2) Dilution of Human BDNF Standard

• Number tubes 1 - 8. Final Concentrations to be Tube # 1 - 2,000 pg/ml, # 2 - 1,000 pg/ml, # 3 - 500 pg/ml, # 4 - 250 pg/ml, # 5 - 125 pg/ml, # 6 - 62.5 pg/ml, # 7 - 31.25 pg/ml, # 8 - 0.0 (Blank).

• To generate standard # 1, add 200 µl of the reconstituted standard stock solution of 10 ng/ml and 800 µl of Reagent Diluent to tube # 1 for a final volume of 1,000 µl. Mix thoroughly.

• Add 300 µl of Reagent Diluent to tubes # 2 - 7.

• To generate standard # 2, add 300 µl of standard # 1 from tube # 1 to tube # 2 for a final volume of 600 µl. Mix thoroughly.

• To generate standard # 3, add 300 µl of standard # 2 from tube # 2 to tube # 3 for a final volume of 600 µl. Mix thoroughly.

• Continue the serial dilution for tube # 4 - 7.

• Tube # 8 is a blank standard to be used with every experiment.

3. Preparation of working solution

1) Each vial contains 500 µl of .

2) should be diluted in 1:100 with Capture Antibody Diluent and mixed thoroughly. (i.e. Add 1 µl to 99 µl Capture Antibody Diluent.)

4. Preparation of working solution

1) Each vial contains 500 µl of .

2) should be diluted in 1:100 with Reagent Diluent and mixed thoroughly. (i.e. Add 1 µl to 99 µl Reagent Diluent.)

5. Preparation of Avidin-Biotin-Peroxidase Complex (ABC) working solution

1) Each vial contains 500 µl of Avidin-Biotin-Peroxidase Complex (ABC).

2) Avidin-Biotin-Peroxidase Complex (ABC) should be diluted in 1:100 with Reagent Diluent and mixed thoroughly. (i.e. Add 1 µl ABC to 99 µl Reagent Diluent.)

Assay Protocol

It is recommended that all reagents and materials be equilibrated to room temperature (18-25°C) prior to the experiment (see Preparation Before The Experiment, if you have missed this information).

1. Prepare all reagents and working standards as directed previously.
2. Remove excess microplate strips from the plate frame and seal and store them in the original packaging.
3. Add 100 µl of the standard, samples, or control per well. At least two replicates of each standard, sample, or control is recommended.
4. Cover with the plate sealer provided and incubate for 120 minutes at room temperature (or 90 min. at 37 °C).
5. Remove the cover and discard the liquid in the wells into an appropriate waste receptacle. Invert the plate on the benchtop onto a paper towel and tap the plate to gently blot any remaining liquid. It is recommended that the wells are not allowed to completely dry at any time.
6. Add 100 µl of the prepared 1x to each well.
7. Cover with a plate sealer and incubate for 90 minutes at room temperature (or 60 minutes at 37°C).
8. Wash the plate 3 times with **PBS**:

a. Discard the liquid in the wells into an appropriate waste receptacle. Then, invert the plate on the benchtop onto a paper towel and tap the plate to gently blot any remaining liquid. It is recommended that the wells are not allowed to completely dry at any time.

b. Add 300 µl of **PBS** to each assay well. (For cleaner background incubate for 60 seconds between each wash).

c. Repeat steps a-b 2 additional times.

d. Discard the wash buffer in the wells into an appropriate waste receptacle. Then, invert the plate on the benchtop onto a paper towel and tap the

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plate to gently blot any remaining liquid.
9. Add 100 µl of the prepared 1x Avidin-Biotin-Peroxidase Complex into each well and incubate for 40 minutes at RT (or 30 minutes at 37°C).
10. Wash the plate 5 times with **PBS-T**:
a. Discard the liquid in the wells into an appropriate waste receptacle. Then, invert the plate on the benchtop onto a paper towel and tap the plate to gently blot any remaining liquid. It is recommended that the wells are not allowed to completely dry at any time.
b. Add 300 µl of **PBS-T** to each assay well. (For cleaner background incubate for 60 seconds between each wash).
c. Repeat steps a-b 4 additional times.
d. Discard the wash buffer in the wells into an appropriate waste receptacle. Then, invert the plate on the benchtop onto a paper towel and tap the plate to gently blot any remaining liquid.
11. Add 90 µl of Color Developing Reagent to each well and incubate in the dark for 30 minutes at RT (or 25-30 minutes at 37°C). (The optimal incubation time must be empirically determined. A guideline to look for is blue shading the top four standard wells, while the remaining standards remain clear.)
12. Add 100 µl of Stop Solution to each well. The color should immediately change to yellow.
13. Within 30 minutes of stopping the reaction, the O.D. absorbance should be read with a microplate reader at 450nm.

Data Analysis

Average the duplicate readings for each standard, sample, and control. Subtract the average zero standard O.D. reading.

It is recommended that a standard curve be created using computer software to generate a four-parameter logistic (4-PL) curve-fit. A free program capable of generating a four-parameter logistic (4-PL) curve-fit can be found online at: www.myassays.com/four-parameter-logistic-curve.assay.

Alternatively, plot the mean absorbance for each standard against the concentration. The measured concentration in the sample can be interpolated by using linear regression of each average relative O.D. against the standard curve generated using curve fitting software. This will generate an adequate but less precise fit of the data.

For diluted samples, the concentration reading from the standard curve must be multiplied by the dilution factor.

Background on BDNF

Brain-derived neurotrophic factor (BDNF) is a prosurvival factor induced by cortical neurons that is necessary for survival of striatal neurons in the brain. It is a secreted protein with the molecular weight of 27.8kDa, consisting of 247 amino acids. It is known to promote neuronal survival and differentiation. BDNF shares substantial amino acid sequence identity with nerve growth factor (NGF). BDNF and neurotrophin-3 (NT-3) are two recently cloned neurotrophic factors that are homologous to NGF. mRNA products of the BDNF and NT-3 genes are detected in the adult human brain, suggesting that these proteins are involved in the maintenance of the adult nervous system. BDNF and other neurotrophins are critically involved in long-term potentiation (LTP). BDNF-mediated LTP is induced postsynaptically. BDNF has trophic effects on serotonergic (5-HT) neurons in the central nervous system. BDNF has an essential maintenance function in the regulation of anxiety-related behavior and in food intake through central mediators in both the basal and fasted state. It plays a role in treating breathing disorders such as respiratory insufficiency after spinal injury. The mature form of BDNF is identical in all mammals examined, and the gene encoding human BDNF to chromosome 11, band p13.

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6 Publications Citing This Product

1. PubMed ID: 25093591, Tajerian M, Leu D, Zou Y, Sahbaie P, Li W, Khan H, Hsu V, Kingery W, Huang Tt, Becerra L, Clark Jd. Anesthesiology. 2014 Oct;121(4):852-65. Doi: 10.1097/Aln.0000000000000403. Brain Neuroplastic Changes Accompany Anxiety And Memory Deficits In A Mo...

2. PubMed ID: 28542481, Schulze, J., Kaiser, O., Paasche, G., Lamm, H., Pich, A., Hoffmann, A.,..., & Warnecke, A. (2017). Effect of hyperbaric oxygen on BDNF-release and neuroprotection: Investigations with human mesenchymal stem cells and genetically modified NIH3T3 fi...

3. PubMed ID: 26918945, Magnetic Beads Enhance Adhesion of NIH 3T3 Fibroblasts: A Proof-of-Principle In Vitro Study for Implant-Mediated Long-Term Drug Delivery to the Inner Ear

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