Human BDNF ELISA Kit

Enzyme Immunoassay for the quantification of Human BDNF in serum, plasma (platelet-poor plasma), cell culture supernatants

Catalog number: ARG81251

Package: 96 wells

For research use only. Not for use in diagnostic procedures.

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INTRODUCTION

The protein encoded by this gene is a member of the nerve growth factor family. It is induced by cortical neurons, and is necessary for survival of striatal neurons in the brain. Expression of this gene is reduced in both Alzheimer's and Huntington disease patients. This gene may play a role in the regulation of stress response and in the biology of mood disorders. Multiple transcript variants encoding distinct isoforms have been described for this gene. [provided by RefSeq, Jan 2009] During development, promotes the survival and differentiation of selected neuronal populations of the peripheral and central nervous systems. Participates in axonal growth, pathfinding and in the modulation of dendritic growth and morphology. Major regulator of synaptic transmission and plasticity at adult synapses in many regions of the CNS. The versatility of BDNF is emphasized by its contribution to a range of adaptive neuronal responses including long-term potentiation (LTP), long-term depression (LTD), certain forms of short-term synaptic plasticity, as well as homeostatic regulation of intrinsic neuronal excitability. [UniProt]

PRINCIPLE OF THE ASSAY

This assay employs the quantitative sandwich enzyme immunoassay technique. An antibody specific for BDNF has been pre-coated onto a microtiter plate. Standards or samples are pipetted into the wells and any BDNF present is bound by the immobilized antibody. After washing away any unbound substances, a biotin-conjugated antibody specific for BDNF is added to each well and incubate. Following a washing to remove unbound substances, streptavidin conjugated to Horseradish Peroxidase (HRP) is added to each microplate well and incubated. After washing away any unbound antibody-

enzyme reagent, a substrate solution (TMB) is added to the wells and color develops in proportion to the amount of BDNF bound in the initial step. The color development is stopped by the addition of acid and the intensity of the color is measured at a wavelength of 450nm ±2nm.The concentration of BDNF in the sample is then determined by comparing the O.D of samples to the standard curve.

MATERIALS PROVIDED & STORAGE INFORMATION

Store the unopened kit at 2-8°C. Use the kit before expiration date.

Component	Quantity	Storage information
Antibody-coated microplate	8 X 12 strips	4°C. Unused strips should be sealed tightly in the air-tight pouch.
Standard (Lyophilized)	2 X 1 ng/vial	4°C
Standard/Sample diluent buffer	4 X 16 ml	4°C
Antibody conjugate concentrate	2 vials (60 µl)	4°C
Antibody diluent buffer	16 ml	4°C
HRP-Streptavidin concentrate	2 vials (60 µl)	4°C (Protect from light)
HRP-Streptavidin diluent buffer	16 ml	4°C
20X Wash buffer	25 ml	4°C
TMB substrate	12 ml	4°C (Protect from light)
STOP solution	12 ml	4°C
Plate sealer	4 strips	Room temperature

MATERIALS REQUIRED BUT NOT PROVIDED

- Microplate reader capable of measuring absorbance at 450nm (optional: read at 610-650 nm as the reference wave length)
- Pipettes and pipette tips
- Deionized or distilled water
- 37°C oven or incubator
- Automated microplate washer (optional)

TECHNICAL HINTS AND PRECAUTIONS

- Wear protective gloves, clothing, eye, and face protection especially while handling blood or body fluid samples.
- Store the kit at 4°C at all times. Reconstituted standard should be stored at-20°C for up to 1 month. Other opened components should be stored at 4°C and used it within 1 month after opening.
- If crystals are observed in the 20X Wash buffer, warm to RT or 37°C until the crystals are completely dissolved.
- Ensure complete reconstitution and dilution of reagents prior to use.
- All materials should be equilibrated to room temperature (RT, 22-25°C) 15-20 min before use.
- All reagents should be mixed by gentle inversion or swirling prior to use. Do not induce foaming.
- Before using the kit, spin tubes and bring down all components to the bottom of tubes.
- Mix the contents of the microplate wells thoroughly by microplate shaker

for 1 min or gently tap the plate to ensure good test results. Please mix carefully to avoid well-to-well contamination. Do not reuse microwells.

- The TMB Color developing agent should be colorless and transparent before using.
- Use reservoirs only for single reagents. This especially applies to the substrate reservoirs. Using a reservoir for dispensing a substrate solution that had previously been used for the conjugate solution may turn solution colored. Do not pour reagents back into vials as reagent contamination may occur.
- Do not let wells dry during assay; add reagents immediately after completing the rinsing steps.
- Avoid using reagents from different batches.
- It is highly recommended that the standards, samples and controls be assayed in duplicates.
- Change pipette tips between the addition of different reagent or samples.

SAMPLE COLLECTION & STORAGE INFORMATION

The sample collection and storage conditions listed below are intended as general guidelines. Sample stability has not been evaluated.

Cell Culture Supernatants - Remove particulates by centrifugation for 10 min at 1000 x g and aliquot & store samples at ≤ -20°C. Avoid repeated freeze-thaw cycles.

Serum- Use a serum separator tube (SST) and allow samples to clot for 30 minutes before centrifugation for 15 minutes at 1000 x g. Collect serum and assay immediately or aliquot and store samples at ≤ -20°C. Avoid repeated freeze-thaw cycles.

Plasma (Platelet-poor Plasma) - Collect plasma on ice using EDTA or heparin as an anticoagulant. Centrifuge (1000 x g) for 15 minutes at 2-8°C within 30 minutes of collection. Collect the supernatants and centrifuge (10,000 x g) again for 10 min at 2-8°C to remove platelet. Collect the supernatants and assay immediately or aliquot and store samples at ≤ -20°C. Avoid repeated freeze-thaw cycles.

Note:

a) Do not use haemolytic, icteric or lipaemic specimens.
b) Samples containing sodium azide should not be used in the assay.

REAGENT PREPARATION

- 1X Wash buffer: Dilute 20X Wash buffer into distilled water to yield 1X Wash buffer. (E.g. 25 ml of 20X Wash buffer + 475 ml of distilled water) The diluted Wash buffer is stable for 4 weeks at 2°C to 8°C.
- 1X Antibody conjugate: 5-10 minutes before use (freshly prepared is recommended), dilute 100X antibody conjugate concentrate into Antibody diluent buffer to yield 1X detection antibody solution. (e.g. 10 µl of 100X antibody conjugate concentrate + 990 µl of Antibody diluent buffer)
- 1X HRP-Streptavidin Solution: 20 minutes before use, dilute 100X HRP-Streptavidin concentrate solution into HRP-Streptavidin diluent buffer to yield 1X HRP-Streptavidin Solution buffer. (e.g. 10 µl of 100X HRP-Streptavidin concentrate solution + 990 µl of HRP-Streptavidin diluent buffer)
- Sample: If the initial assay found samples contain BDNF higher than the highest standard, the samples can be diluted with Standard/Sample diluent buffer and then re-assay the samples. For the calculation of the concentrations this dilution factor has to be taken into account.

  Note: For normal human serum samples are suggested to make a 1:20-1:100 dilution with Standard/Sample diluent buffer before assay. And for platelet-poor plasma samples can be used with undiluted samples or a 1:2-1:5 dilution with Standard/Sample diluent buffer before assay.

Example:

a) Dilution 1:20: 5 µl sample + 95 µl Standard/Sample diluent buffer (mix thoroughly).

b) Dilution 1:100: 20 µl 1:20 diluted sample from a) + 80 µl Standard/Sample diluent buffer (mix thoroughly).

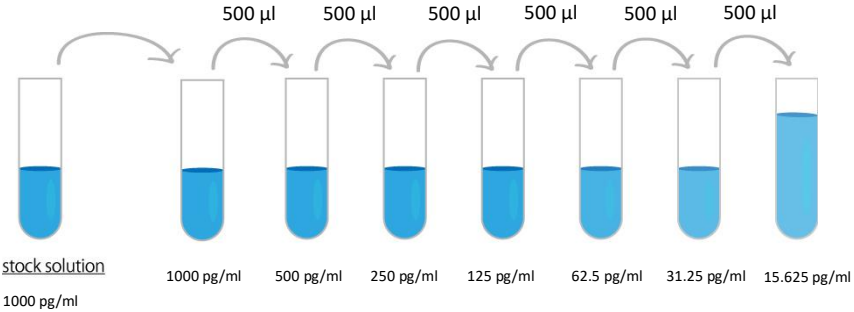
c) Dilution 1:5: 20 µl sample + 80 µl Standard/Sample diluent buffer (mix thoroughly).

e) For duplicates, make sure to make minimal 250 µl of every sample to be able to transfer 100 µl to the coated plate.

(It is recommended to do pre-test to determine the suitable dilution factor).

- Standards: Reconstitute the standard with 1 ml Standard/Sample diluent buffer to yield a stock concentration of 1000 pg/ml. Allow the stock standard to sit for at least 15 minutes with gentle agitation to make sure the standard is dissolved completely before making serial dilutions. The Standard/Sample diluent buffer serves as zero standard (0 pg/ml), and the rest of the standard serial dilution can be diluted as according to the suggested concentration below: 1000 pg/ml, 500 pg/ml, 250 pg/ml, 125 pg/ml, 62.5 pg/ml, 31.25 pg/ml, 15.625 pg/ml.

  Note: The reconstitute stock standard can be aliquoted and stored at ≤ -20°C up to a month. DO NOT reused the diluted standards.



Dilute BDNF standard as according to the table below:

Standard	BDNF Conc. (pg/ml)	µl of Standard/Sample diluent	µl of standard
S7	1000 pg/ml	0	1000 (1000 pg/ml Stock)
S6	500 pg/ml	500	500 (S7)
S5	250 pg/ml	500	500 (S6)
S4	125 pg/ml	500	500 (S5)
S3	62.5 pg/ml	500	500 (S4)
S2	31.25 pg/ml	500	500 (S3)
S1	15.625 pg/ml	500	500 (S2)
S0	0	500	0

ASSAY PROCEDURE

All materials should be equilibrated to room temperature (RT) before use. Standards, samples and controls should be assayed in duplicates.

1. Remove excess microplate strips from the plate frame, return them to the foil pouch containing the desiccant pack, and reseal it. It can be store at 2-8°C for up to 1 month.
2. Add **100 µl** of **standards, samples and zero controls** (Standard/Sample diluent buffer) into wells. Incubate for **1.5 h at 37 °C**.
3. Aspirate each well and wash, repeating the process three times for a total **four washes**. Wash by filling each well with **1× Wash Buffer (350 µl)** using a squirt bottle, manifold dispenser, or autowasher. Complete removal of liquid at each is essential to good performance. After the last wash, remove any remaining Wash Buffer by aspirating, decanting or blotting against clean paper towels.
4. Add **100 µl** of **1X Antibody conjugate** into each well. Cover wells and incubate for **1 hour at 37 °C.**
5. Aspirate each well and **wash as step 3**.
6. Add **100 µl** of **1X HRP-Streptavidin solution** to each well. Cover wells and incubate for **30 minutes at 37 °C**.
7. Aspirate each well and **wash as step 3.**
8. Add **100 µl** of **TMB substrate Reagent** to each well. Incubate for **10-20 minutes at 37°C in dark.**
9. Add **100 µl** of **Stop Solution** to each well. The color of the solution should change from blue to yellow. Gently tap the plate to ensure thorough

mixing.

10. Read the OD with a microplate reader at **450 nm** immediately. (optional: read at 610-650 nm as the reference wave length) It is recommended read the absorbance within 30 minutes after adding the stop solution.

CALCULATION OF RESULTS

1. Calculate the average absorbance values for each set of standards, controls and patient samples.

2. Using linear or semi-log graph paper, construct a standard curve by plotting the mean absorbance obtained from each standard against its concentration with absorbance value on the vertical (Y) axis and concentration on the horizontal (X) axis.

3. Using the mean absorbance value for each sample determine the corresponding concentration from the standard curve.

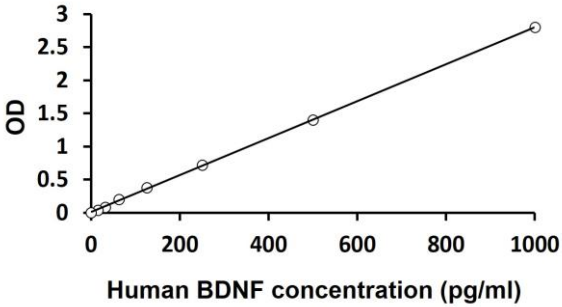
4. Automated method: The results in the IFU have been calculated automatically using a 4 PL (4 Parameter Logistics) curve fit. 4 Parameter Logistics is the preferred method. Other data reduction functions may give slightly different results.

5. arigo provides GainData®, an in-house development ELISA data calculator, for ELISA data result analysis. Please refer our GainData® website for details. (https://www.arigobio.com/elisa-analysis)

6. If the samples have been diluted, the concentration read from the standard curve must be further converted by the appropriate dilution factor according to the sample preparation procedure as described above.

EXAMPLE OF TYPICAL STANDARD CURVE

The following data is for demonstration only and cannot be used in place of data generations at the time of assay.



QUALITY ASSURANCE

Sensitivity

The minimum detectable dose (MDD) of Human BDNF ranged from 15.625-1000 pg/ml. The mean MDD was 7 pg/ml.

Specificity

This assay recognizes natural and recombinant Human BDNF. No significant cross-reactivity or interference with the factors below was observed:

50 ng/ ml of recombinant proteins:

Human: CNTF, Pro-BDNF (aa19-128), beta NGF, NGF R, NT-3, NT-4

Mouse: Pro-BDNF (aa19-128), beta NGF, NGF R, TrKB, TrKC

Intra-assay and Inter-assay precision

The CV values of both intra and inter precision fall below 10%.