



KAMIYA BIOMEDICAL COMPANY

Rat Brain Derived Neurotrophic Factor (BDNF) ELISA

**For the quantitative determination of rat BDNF in
serum, plasma, tissue homogenates, cell culture supernates and
other biological fluids**

Cat. No. KT-8575

For Research Use Only. Not for use in diagnostic procedures.

Product Information

Rat Brain Derived Neurotrophic Factor (BDNF) ELISA

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INTENDED USE

The kit is a sandwich enzyme immunoassay for the *in vitro* quantitative measurement of rat BDNF in serum, plasma, tissue homogenates, cell culture supernates, and other biological fluids. For research use only. Not for use in diagnostic procedures.

COMPONENTS

Reagents	Quantity
Pre-coated, ready to use 96-well strip plate	1
Calibrator	2
Calibrator Diluent	1 × 20 mL
Detection Reagent A	1 × 120 µL
Detection Reagent B	1 × 120 µL
Assay Diluent A	1 × 12 mL
Assay Diluent B	1 × 12 mL
TMB Substrate	1 × 9 mL
Stop Solution	1 × 6 mL
Wash Buffer (30X concentrate)	1 × 20 mL
Plate sealer for 96 wells	4

MATERIALS REQUIRED BUT NOT SUPPLIED

1. Microplate reader with 450 ± 10 nm filter.
2. Precision single or multi-channel pipettes and disposable tips.
3. Eppendorf Tubes for diluting samples.
4. Deionized or distilled water.
5. Absorbent paper for blotting the microtiter plate.
6. Container for Wash Solution

STORAGE

All the reagents should be kept according to the labels on vials. The **Calibrator**, **Detection Reagent A**, **Detection Reagent B** and the **96-well strip plate** should be stored at -20°C upon receipt while the others should be at 4°C. The unused strips should be kept in a sealed bag with the desiccant provided to minimize exposure to damp air. Opened test kits will remain stable until the expiration date provided they are stored as described above.

PRINCIPLE

The microtiter plate provided in this kit has been pre-coated with an antibody specific to BDNF. Calibrators or samples are then added to the appropriate microtiter plate wells with a biotin-conjugated antibody preparation specific for BDNF. Next, Avidin conjugated to Horseradish Peroxidase (HRP) is added to each microplate well and incubated. Then the TMB substrate solution is added to each well. Only those wells that contain BDNF, biotin-conjugated antibody and enzyme-conjugated Avidin will exhibit a change in color. The enzyme-substrate reaction is terminated by the addition of a sulfuric acid solution and the color change is measured spectrophotometrically at a wavelength of 450 nm \pm 10 nm. The concentration of BDNF in the samples is then determined by comparing the O.D. of the samples to the calibration curve.

SAMPLE COLLECTION AND STORAGE

Serum

Use a serum separator tube and allow samples to clot for two hours at room temperature or overnight at 4°C before centrifugation for 20 minutes at approximately 1,000 x g. Assay freshly prepared serum immediately or store samples in aliquot at -20°C or -80°C for later use. Avoid repeated freeze/thaw cycles.

Plasma

Collect plasma using EDTA or heparin as an anticoagulant. Centrifuge samples for 15 minutes at 1,000 x g at 4°C within 30 minutes of collection. Remove plasma and assay immediately or store samples in aliquot at -20°C or -80°C for later use. Avoid repeated freeze/thaw cycles.

Tissue homogenates

The preparation of tissue homogenates will vary depending upon tissue type. For this assay, tissues were rinsed in ice-cold PBS (0.01 mol/L, pH 7.0-7.2) to remove excess blood thoroughly and weighed before homogenization. Minced the tissues to small pieces and homogenized them in 5-10 mL of PBS with a glass homogenizer on ice (Micro Tissue Grinders works, too). The resulting suspension was sonicated with an ultrasonic cell disrupter or subjected to two freeze-thaw cycles to further break the cell membranes. After that, the homogenates were centrifugated for 5 minutes at 5,000 x g. Remove the supernate and assay immediately or aliquot and store at \leq 20°C.

Cell culture supernates and other biological fluids

Centrifuge samples for 20 minutes at 1,000 x g. Remove particulates and assay immediately or store samples in aliquot at -20°C or -80°C for later use. Avoid repeated freeze/thaw cycles.



Note:

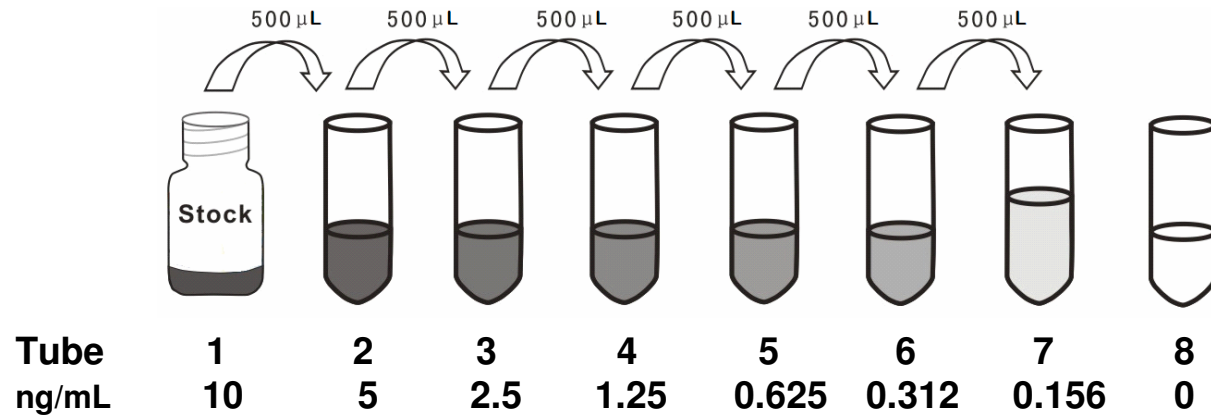
1. Samples to be used within 5 days may be stored at 4°C, otherwise samples must be stored at -20°C (\leq 1 month) or -80°C (\leq 2 months) to avoid loss of bioactivity and contamination.
2. When performing the assay, bring samples to room temperature.
3. Sample hemolysis will influence the result, so hemolytic specimen should not be detected.

REAGENT PREPARATION

Bring all kit components and samples to room temperature (18-25°C) before use.

Calibrator

Reconstitute the **Calibrator** with 1.0 mL of **Calibrator Diluent**, kept for 10 minutes at room temperature, shake gently (not to foam). The concentration of the calibrator in the stock solution is 10 ng/mL. Please prepare 7 tubes containing 0.5 mL Calibrator Diluent and produce a double dilution series according to the picture shown below. Mix each tube thoroughly before the next transfer. Set up 7 points of diluted calibrator such as 10 ng/mL, 5 ng/mL, 2.5 ng/mL, 1.25 ng/mL, 0.625 ng/mL, 0.312 ng/mL, 0.156 ng/mL, and the last EP tubes with **Calibrator Diluent** is the blank as 0 ng/mL.



Detection Reagent A and B

Briefly spin or centrifuge the stock Detection Reagent A and Detection Reagent B before use. Dilute to the working concentration with working **Assay Diluent A or B**, respectively (1:100).

Wash Solution

Dilute 20 mL of Wash Solution Concentrate (30X) with 580 mL of deionized or distilled water to prepare 600 mL of Wash Solution (1X).

TMB substrate

Aspirate the needed dosage of the solution with sterilized tips and do not dump the residual solution into the vial again.



Note:

1. Prepare calibrator within 15 minutes before assay. Please do not dissolve the reagents at 37°C directly.
2. Making serial dilution in the wells directly is not permitted.
3. Please carefully reconstitute Calibrators or working Detection Reagent A and B according to the instruction, and avoid foaming and mix gently until the crystals have completely dissolved. To minimize imprecision caused by pipetting, use small volumes and ensure that pipettors are calibrated. It is recommended to suck more than 10 μL for once pipetting.
4. The reconstituted Calibrators, Detection Reagent A and Detection Reagent B can be **used only once**.
5. If crystals have formed in the Wash Solution concentrate (30X), warm to room temperature and mix gently until the crystals have completely dissolved.
6. Contaminated water or container for reagent preparation will influence the detection result.

SAMPLE PREPARATION

1. Kamiya Biomedical Company is only responsible for the kit itself, but not for the samples consumed during the assay. The user should calculate the possible amount of the samples used in the whole test. Please reserve sufficient samples in advance.
2. Please predict the concentration before assaying. If values for these are not within the range of the calibration curve, users must determine the optimal sample dilutions for their particular experiments. Sample should be diluted by 0.01 mol/L PBS (PH=7.0-7.2).
3. If the samples are not indicated in the manual, a preliminary experiment to determine the validity of the kit is necessary.
4. Tissue or cell extraction samples prepared by chemical lysis buffer may cause unexpected ELISA results due to the impacts of certain chemicals.

5. Owing to the possibility of mismatching between antigen from other resource and antibody used in our kits (e.g., antibody targets conformational epitope rather than linear epitope), some native or recombinant proteins from other manufacturers may not be recognized by our products.
6. Influenced by the factors including cell viability, cell number and also sampling time, samples from cell culture supernatant may not be detected by the kit.
7. Fresh samples without long time storage is recommended for the test. Otherwise, protein degradation and denaturalization may occur in those samples and finally lead to wrong results.

ASSAY PROCEDURE

1. Determine wells for diluted calibrator, blank and sample. Prepare 7 wells for calibrator, 1 well for blank. Add 100 μ L each of dilutions of calibrator (read Reagent Preparation), blank and samples into the appropriate wells. Cover with the Plate sealer. Incubate for 2 hours at 37°C.
2. Remove the liquid from each well, don't wash.
3. Add 100 μ L of **Detection Reagent A** working solution to each well. Incubate for 1 hour at 37°C after covering it with the Plate sealer.
4. Aspirate the solution and wash with 350 μ L of 1X Wash Solution to each well using a squirt bottle, multi-channel pipette, manifold dispenser or autowasher, and let sit for 1~2 minutes. Remove the remaining liquid from all wells completely by snapping the plate onto absorbent paper. Repeat 3 times. After the last wash, remove any remaining Wash Buffer by aspirating or decanting. Invert the plate and blot it against absorbent paper.
5. Add 100 μ L of **Detection Reagent B** working solution to each well. Incubate for 30 minutes at 37°C after covering it with the Plate sealer.
6. Repeat the aspiration/wash process five times as in step 4.
7. Add 90 μ L of **Substrate Solution** to each well. Cover with a new Plate sealer. Incubate for 15 - 25 minutes at 37°C (Don't exceed 30 minutes). Protect from light. The solution will turn blue after the addition of Substrate Solution.
8. Add 50 μ L of **Stop Solution** to each well. The liquid will turn yellow after the addition of Stop solution. Mix the liquid by gently tapping the side of the plate. If color change does not appear uniform, gently tap the plate to ensure thorough mixing.
9. Remove any drops of solution or fingerprints on the bottom of the plate and confirm there are no bubbles on the surface of the liquid. Then, run the microplate reader and conduct measurements at 450 nm immediately.



Note:

1. **Assay preparation:** Keep appropriate numbers of strips for 1 experiment and remove extra strips from microtiter plate. Unused strips should be resealed and stored at -20°C.
2. **Sample or reagent additions:** Use freshly prepared Calibrators. Carefully add samples to wells and mix gently to avoid foaming. Do not touch the well walls if possible. For each step in the procedure, total dispensing time for addition of reagents or samples to the assay plate should not exceed 10 minutes. This will ensure equal elapsed time for each pipetting step, without interruption. Duplication of all calibrators and samples, although not required, is recommended. To avoid cross-contamination, change pipette tips between additions of each calibrator level, between sample additions, and between reagent additions. Also, use separate reservoirs for each reagent.

3. **Incubation:** To ensure accurate results, proper adhesion of plate sealers during incubation steps is necessary. Do not allow wells to sit uncovered for extended periods between incubation steps. After reagents have been added to the well strips, DO NOT let the strips DRY at any time during the assay. Incubation time and temperature must be observed.
4. **Washing:** The wash procedure is critical. Complete removal of liquid at each step is essential to good performance. After the last wash, remove any remaining Wash Solution by aspirating or decanting and remove any drops of solution or fingerprints on the bottom of the plate. Insufficient washing will result in poor precision and falsely elevated absorbance reading.
5. **Controlling of reaction time:** Observe the change of color after adding **TMB Substrate** (e.g. observation once every 10 minutes), if the color is too dark, add **Stop Solution** in advance to avoid excessively strong reaction which will result in inaccurate absorbance reading.
6. **TMB Substrate** is easily contaminated. Protect from light.
7. The environment humidity which is less than 60% might have some effects on the final performance, therefore, a humidifier is recommended to be used at that condition.

CALCULATION OF RESULTS

Average the duplicate readings for each calibrator, control, and sample and subtract the average zero calibrator optical density. Create a calibration curve on log-log graph paper with BDNF concentration on the y-axis and absorbance on the x-axis. Draw the best fit line through the calibration points and it can be determined by regression analysis. It is recommended to use some related software to do this calculation. If samples have been diluted, the concentration read from the calibration curve must be multiplied by the dilution factor.

PERFORMANCE

Detection Range

The detection range is: 0.156 - 10 ng/mL.

The calibration curve concentrations used for the ELISA's were 10, 5, 2.5, 1.25, 0.625, 0.312, 0.156 ng/mL.

Sensitivity

The minimum detectable dose of rat BDNF is typically less than 0.055 ng/mL. The sensitivity of this assay, or Lower Limit of Detection (LLD) was defined as the lowest protein concentration that could be differentiated from zero. It was determined by the mean O.D. value of 20 replicates of the zero calibrator plus three standard deviations.

Specificity

This assay has high sensitivity and excellent specificity for detection of rat BDNF. No significant cross-reactivity or interference was observed.

IMPORTANT NOTES

1. The final experimental results will be closely related to the operative skills of the end users and the experimental environments. Please make sure that sufficient samples are available.
2. This assay is designed to eliminate interference by soluble receptors, ligands, binding proteins, and other factors present in biological samples. However, until all factors have been tested the possibility of interference cannot be eliminated.
3. Do not mix or substitute reagents from one kit lot to another. Use only the reagents supplied by manufacturer.
4. Protect all reagents from strong light during storage and incubation. All the bottle caps of reagents should be tightly closed to prevent the evaporation or contamination by microorganisms.
5. There may be some foggy substance in the plate wells when first opened. This will have no effect on the final assay results. Do not remove microtiter plate from the storage bag until needed.
6. A microtiter plate reader with a bandwidth of 10 nm or less and an optical density range of 0-3 O.D. or greater at 450 nm wavelength is acceptable for use in absorbance measurement.

7. The Stop Solution used with this kit is an acid. Wear eye, hand, face, and clothing protection when using this material.

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