Animal-Free™ Recombinant Human BDNF

Catalog Number: BT-BDNF-AFL

DESCRIPTION

Source	*E. coli*-derived human BDNF protein Arg134-Arg247, with an N-terminal Met Accession # P23560.1 Produced using non-animal reagents in an animal-free laboratory.
N-terminal Sequence Analysis	Met
Predicted Molecular Mass	13.1 kDa

SPECIFICATIONS

SDS-PAGE	12 kDa, under reducing conditions.
Activity	Measured in a cell proliferation assay using BaF mouse pro-B cells transfected with TrkB. The ED_{50} for this effect is 0.100-1.00 ng/mL. The specific activity of Recombinant Human BDNF is >8.0 x 10^5 units/mg, which is calibrated against the human BDNF WHO Standard (NIBSC code: 96/534).
Endotoxin Level	<0.10 EU per 1 µg of the protein by the LAL method.
Purity	>97%, by SDS-PAGE with quantitative densitometry by Coomassie® Blue Staining.
Formulation	Lyophilized from a 0.2 µm filtered solution in PBS with Trehalose. See Certificate of Analysis for details.

PREPARATION AND STORAGE

Reconstitution	Reconstitute the 25 µg size at 250 µg/mL in PBS. Reconstitute all other sizes at 500 µg/mL in PBS.
Shipping	The product is shipped at ambient temperature. Upon receipt, store it immediately at the temperature recommended below.
Stability & Storage	**Use a manual defrost freezer and avoid repeated freeze-thaw cycles.** • 12 months from date of receipt, -20 to -70 °C as supplied. • 1 month, 2 to 8 °C under sterile conditions after reconstitution. • 3 months, -20 to -70 °C under sterile conditions after reconstitution.

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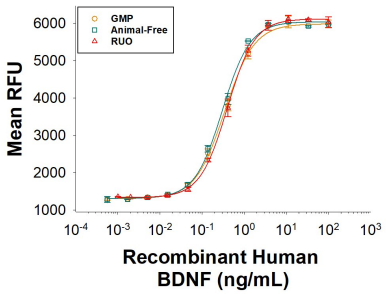
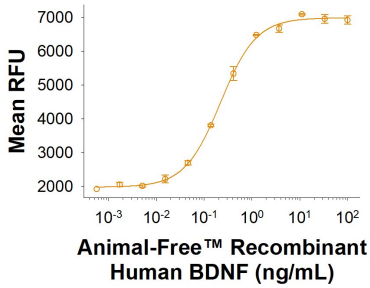
DATA

Bioactivity



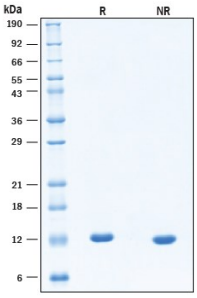
Equivalent Bioactivity of GMP, Animal-Free, and RUO grades of Recombinant Human BDNF. Equivalent bioactivity of GMP (Catalog # BT-BDNF-GMP), Animal-Free (Catalog # BT-BDNF-AFL) and RUO (Catalog # BT-BDNF) grades of Recombinant Human BDNF as measured in a cell proliferation assay using BaF mouse pro-B cells transfected with TrkB (orange, green, red, respectively).

Bioactivity



Animal-Free™ Recombinant Human BDNF Protein Bioactivity. Animal-Free™ Recombinant Human BDNF Protein (Catalog # BT-BDNF-AFL) stimulates cell proliferation of the BaF mouse pro-B cells transfected with TrkB. The ED_{50} for this effect is 0.100-1.00 ng/mL.

SDS-PAGE



Animal-Free™ Recombinant Human BDNF Protein SDS-PAGE. 2 µg/lane of Animal-Free™ Recombinant Human BDNF Protein (Catalog # BT-BDNF-AFL) was resolved with SDS-PAGE under reducing (R) and non-reducing (NR) conditions and visualized by Coomassie® Blue staining, showing bands at 12 kDa.

BACKGROUND

Brain-derived neurotrophic factor (BDNF) is a member of the neurotrophin family of growth factors that are required for the differentiation and survival of specific neuronal subpopulations in both the central as well as the peripheral nervous system.

BDNF is often utilized as a cell culture supplement to promote neural differentiation in regenerative medicine studies and clinical manufacturing protocols.

The neurotrophin family is comprised of at least four proteins including BDNF, nerve growth factor (NGF), neurotrophin-3 (NT3), and NT4/5. Human BDNF is initially expressed as a proprotein, which is then cleaved to yield a mature protein. Mature BDNF is a non-covalently linked homodimer, with each monomer containing antiparallel beta -strands and a characteristic cystine knot motif. Within the mature domain, human BDNF shares the identical amino acid sequence with mature mouse and rat BDNF.

BDNF is strongly expressed in various regions of the brain, including the hippocampus and cerebellum, and weaker expression has been detected in the thymus, liver, spleen, heart, and lung. BDNF participates in axonal growth and pathfinding and in the modulation of dendritic growth and morphology and in later stages of development regulates synaptic transmission and plasticity and acts as a central modulator of pain. BDNF binds with high affinity and specifically activates the TrkB tyrosine kinase receptor. BDNF signaling via TrkB is essential for adult synaptic plasticity and the formation of memories.

The BDNF signaling pathway utilizes both AKT and ERK pathways to exert its pleiotrophic effects in the central nervous system. Decreased expression of BDNF is seen in many neurological diseases such as Alzheimer's disease, Parkinson's disease, Huntington's disease, and autism. Further, BDNF is proposed as a biomarker for psychiatric disorders such as bipolar disease and depression and has been implicated in posttraumatic stress disorder, phobia, and panic disorder. A single amino acid substitution, Val66Met, has been shown to lead to reduced, activity-dependent BDNF secretion and memory impairment.

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MANUFACTURING SPECIFICATIONS

Animal-Free Manufacturing Conditions

Our dedicated controlled-access animal-free laboratories ensure that at no point in production are the products exposed to potential contamination by animal components or byproducts. Every stage of manufacturing is conducted in compliance with R&D Systems' stringent Standard Operating Procedures (SOPs). Production and purification procedures use equipment and media that are confirmed animal-free.

Production

- All molecular biology procedures use animal-free media and dedicated labware.
- Dedicated fermentors are utilized in committed animal-free areas.

Purification

- Protein purification columns are animal-free.
- Bulk proteins are filtered using animal-free filters.
- Purified proteins are stored in animal-free containers in a dedicated cold storage room.

Quality Assurance

- Low Endotoxin Level.
- No impairment of biological activity.
- High quality product obtained under stringent conditions.
- For *ex vivo* research or bioproduction, **additional documentation** can be provided.

Please read our complete Animal-Free Statement

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