

Mature BDNF Rapid ELISA Kit: Human, Mouse, Rat (2 plates)

Catalogue No.: BEK-2211-2P

Description: The Biosensis Mature BDNF Rapid™ enzyme-linked immunosorbent assay (ELISA) Kit is a sandwich ELISA that allows the quantification of mature BDNF in less than 3 hours in cell culture supernatants, serum, plasma (citrate and EDTA), pig serum, cell lysates, brain extracts, human milk and sheep CSF only if used as directed, with a simplified protocol and no loss of sensitivity or specificity. Please refer to the kit protocol for specific use instructions for each substrate application, in particular blood samples, human milk and CSF. Note that accurate quantification of BDNF in human milk requires a secretory IgA (sIgA) blocker which can be purchased separately (BL-001-1250).

This ELISA kit has been tested in independent research laboratories and found to achieve highest reproducibility with intra- and inter-assay CVs as low as 1% and 5%, respectively (Polacchini et al., 2015).

This ELISA kit consists of a pre-coated mouse monoclonal anti-mature BDNF capture antibody, a biotinylated anti-mature BDNF detection antibody and horseradish peroxidase (HRP)-conjugated streptavidin. The addition of a substrate (3,3',5,5'-tetramethylbenzidine, TMB) yields a coloured reaction product which is directly proportional to the concentration of mature BDNF present in samples and protein standards. A BDNF positive control (QC sample) is provided to assure consistent assay performance.

This Mature BDNF ELISA kit employs a recombinant human mature BDNF standard approved by the World Health Organization (WHO, www.nibsc.org). The amino acid sequence of mature BDNF is identical for human, mouse, rat and a number of other species. This kit therefore is suitable to measure mature BDNF in all these species and uses the same antibodies and antigen.

Extensive validation has demonstrated that the Mature BDNF Rapid™ ELISA shows only minimal cross-reactivity with proBDNF. Please refer to our Technical Note #5 for further details on ELISA assay validation for BDNF isoform detection and quantification.

This ELISA kit has not been tested for other applications. It has been configured for research use only and is not to be used for diagnostic or clinical procedures. For in-vitro diagnostic (IVD) applications in the European Economic Area (EEA), we refer to the CE Marked BDNF Rapid™ ELISA kit (BEK-2211-CE).

Related products: BL-001-1250, Secretory IgA (sIgA) blocker: Sample diluent additive for accurate quantification or BDNF in human milk. BEK-2237-2P: Human proBDNF Rapid™ ELISA Kit BEK-2240: Mature BDNF/proBDNF Combo Rapid™ ELISA Kit

Batch No.: Refer to the product label.

Antigen: BDNF belongs to the neurotrophin family and regulates the survival and differentiation of neurons during development. The alterations in BDNF expression induced by various kinds of

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brain insult including stress, ischemia, seizure activity and hypoglycemia, may contribute to some pathologies such as depression, epilepsy, Alzheimer's Disease, and Parkinson's disease. **FUNCTION:** BDNF promotes the survival of neuronal populations that are all located either in the central nervous system or directly connected to it. BDNF is also a 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. **SUBUNIT:** Monomers and homodimers. Binds to NTRK2/TRKB. **SUBCELLULAR LOCATION:** Secreted protein. **Post Translation Modification (PTM):** The propeptide is N-glycosylated and glycosulfated. **PTM:** Converted into mature BDNF by plasmin (PLG). **DISEASE:** Defects in BDNF are a cause of congenital central hypoventilation syndrome (CCHS); also known as congenital failure of autonomic control or Ondine curse. CCHS is a rare disorder characterized by abnormal control of respiration in the absence of neuromuscular or lung disease, or an identifiable brain stem lesion. A deficiency in autonomic control of respiration results in inadequate or negligible ventilatory and arousal responses to hypercapnia and hypoxemia. CCHS is frequently complicated with neurocristopathies such as Hirschsprung disease that occurs in about 16% of CCHS cases. **SIMILARITY:** Belongs to the NGF-beta family.

Other Names:	Brain-derived neurotrophic factor; BDNF; Abrineurin
Accession:	P23560 BDNF_HUMAN;
Specificity:	Human, mouse, rat and numerous other species.
Cross-reactivity:	No cross-reactivity is observed for nerve growth factor (NGF), neurotrophin-3 (NT-3), NT-4/5, glial cell line-derived neurotrophic factor (GDNF) and vascular endothelial growth factor (VEGF165) tested at 25 ng/mL in assay buffer. The reactivity of full-length proBDNF (0.125 ng/mL - 5 ng/mL) was determined in six independent assays using proBDNF proteins from four different sources (mammalian and bacterial, wild-type and mutated). The average cross-reactivity of proBDNF was found to be 5.3% +/- 0.5% in weight (w/v) concentration, or 12.1% +/- 1.2% in molar concentration (mean +/- SEM). Additional proBDNF cross-reactivity experiments were conducted as summarized in our Technical Note #5.
Storage:	Store at 2-8C
Expiry Date:	12 months from purchase.
Specific References:	Nishiyama M et al. (2020) Homostachydrine is a Xenobiotic Substrate of OCTN1/SLC22A4 and Potentially Sensitizes Pentylentetrazole-Induced Seizures in Mice. <i>Neurochem Res.</i> [Epub ahead of print]. Application: Mouse, acid-extracted hippocampal homogenate.

Lorinczova HT et al. (2020) Co-Administration of Iron and a Bioavailable Curcumin Supplement Increases Serum BDNF Levels in Healthy Adults. *Antioxidants (Basel).* 9(8):E645. Application: Human serum.

Yap NY F et al. (2020) Associations of plasma brain-derived neurotrophic factor (BDNF) and

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Val66Met polymorphism (rs6265) with long-term cancer-related cognitive impairment in survivors of breast cancer. *Breast Cancer Res Treat.* [Epub ahead of print]. Application: Human plasma.

Vasilopoulou F et al. (2020) Amelioration of BPSD-Like Phenotype and Cognitive Decline in SAMP8 Mice Model Accompanied by Molecular Changes After Treatment With I 2-Imidazoline Receptor Ligand MCR5. *Pharmaceutics.* 12(5):E475. Application: Mouse hippocampus RIPA-homogenates.

Mueller ST et al. (2020) Negative Association Between Left Prefrontal GABA Concentration and BDNF Serum Concentration in Young Adults. *Heliyon.* 6(5):e04025. Application: Human serum.

Chen LF et al. (2020) The NMDA receptor subunit GluN3A regulates synaptic activity-induced and myocyte enhancer factor 2C (MEF2C)-dependent transcription. *J Biol Chem.* [Epub ahead of print]. Application: Rat neuronal cell lysate, acid-extracted.

Companys-Aleman J et al. (2020) A Novel NMDA Receptor Antagonist Protects against Cognitive Decline Presented by Senescent Mice. *Pharmaceutics.* 12(3), 284. Application: Mouse hippocampal homogenates.

Furukawa Y et al. (2020) Citrus Auraptene Induces Expression of Brain-Derived Neurotrophic Factor in Neuro2a Cells. *Molecules.* 25(5). Application: Mouse Neuro2a culture supernatant.

Holze F et al. (2019) Distinct acute effects of LSD, MDMA, and D-amphetamine in healthy subjects. *Neuropsychopharmacology.* [Epub ahead of print]. Application: Human plasma.

Sumiyoshi E et al. (2019) Sub-Chronic Consumption of Dark Chocolate Enhances Cognitive Function and Releases Nerve Growth Factors: A Parallel-Group Randomized Trial. *Nutrients.* 11(11). Application: Human plasma.

Sartori A et al. (2019) Interferon-beta, but not Glatiramer Acetate treatment induces gender-specific increase in BDNF serum levels in relapsing-remitting multiple sclerosis female patients.

Res J Neuro N Disord. 1:5-18. Application: Human serum. Please refer to our Technical Note #5 for validation experiments disproving the author's claim that the Biosensis Mature BDNF Rapid™ ELISA quantifies total BDNF!

Vanicek T et al. (2019) Repetitive Enhancement of Serum BDNF Subsequent to Continuation ECT. *Acta Psychiatr Scand.* [Epub ahead of print]. Application: Human serum.

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Gejl AK et al. (2019) Associations between serum and plasma brain-derived neurotrophic factor and influence of storage time and centrifugation strategy. *Sci Rep.* 9(1):9655. Application: Human serum and EDTA-plasma.

Li X et al. (2019) Exercise enhances the expression of brain-derived neurotrophic factor in the hippocampus accompanied by epigenetic alterations in senescence-accelerated mice prone 8. *Neurosci Lett.* [Epub ahead of print]. Application: Mouse brain homogenates.

Yang CY et al. (2019) Panax notoginsenoside Rb1 Restores the Neurotrophic Imbalance Following Photothrombotic Stroke in Rats. *Neurotox Res.* [Epub ahead of print]. Application: Rat brain homogenates.

Du Y et al. (2019) Genome-Wide, Integrative Analysis Implicates Exosome-Derived MicroRNA Dysregulation in Schizophrenia. *Schizophr Bull.* [Epub ahead of print]. Application: Human serum.

Vanicek T et al. (2019) Acute and Subsequent Continuation Electroconvulsive Therapy Elevates Serum BDNF Levels in Patients with Major Depression. *Brain Stimul.* [In press]. Application: Human serum, plasma.

Duart-Castells L et al. (2019) 7,8-dihydroxyflavone blocks the development of behavioral sensitization to MDPV, but not to cocaine: differential role of the BDNF-TrkB pathway. *Biochem Pharmacol.* [Epub ahead of print]. Application: Mouse RIPA tissue homogenates.

Pedard M et al. (2018) Brain-derived neurotrophic factor in peripheral blood mononuclear cells and stroke outcome. *Exp Biol Med (Maywood).* [Epub ahead of print]. Application: Human serum and PBMCs.

Akimoto H et al. (2018) Changes in brain metabolites related to stress resilience: Metabolomic analysis of the hippocampus in a rat model of depression. *Behav Brain Res.* [Epub ahead of print]. Application: Rat hippocampus RIPA-homogenate.

Ishimoto T et al. (2018) Ergothioneine-induced neuronal differentiation is mediated through activation of S6K1 and neurotrophin 4/5-TrkB signaling in murine neural stem cells. *Cell Signal.* [Epub ahead of print]. Application: Mouse cell lysate and brain homogenate.

Neves LM et al. (2018) Aerobic exercise program with or without motor complexity as an add-on to the pharmacological treatment of depression - study protocol for a randomized controlled trial. *Trials.* 19:545. Application: Human serum.

Kataoka T et al. (2018) Combined brain-derived neurotrophic factor with extinction

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training alleviate impaired fear extinction in an animal model of post-traumatic stress disorder. *Genes Brain Behav.* [Epub ahead of print]. Application: Rat brain homogenate.

Pietrogrande G et al. (2018) Low Oxygen Post Conditioning as an Efficient Non-pharmacological Strategy to Promote Motor Function After Stroke. *Transl. Stroke Res.* 2018 Aug 28; [Epub ahead of print]. Application: Mouse brain homogenate.

Vigli D et al. (2018) Chronic treatment with the phytocannabinoid Cannabidiol (CBDV) rescues behavioural alterations and brain atrophy in a mouse model of Rett syndrome. *Neuropharmacology.* 2018 Jul 26; [Epub ahead of print]. Application: Mouse hippocampus homogenate.

Rault JL et al. (2018) Brain-derived neurotrophic factor in serum as an animal welfare indicator of environmental enrichment in pigs. *Domest Anim Endocrinol.* 2018 June 4 [In press]. Application: Pig serum.

Merlo S et al. (2018) The contribution of microglia to early synaptic compensatory responses that precede β -amyloid-induced neuronal death. *Sci Rep.* 2018 May 8;8(1):7297. Application: Culture supernatants.

Harnish SM et al. (2018) Aerobic Exercise as an Adjuvant to Aphasia Therapy: Theory, Preliminary Findings, and Future Directions. *Clin Ther.* 2018 Jan; 40(1):35-48. Application: Human serum.

Turnbull MT et al. (2018) Acute Down-regulation of BDNF Signaling Does Not Replicate Exacerbated Amyloid- β Levels and Cognitive Impairment Induced by Cholinergic Basal Forebrain Lesion. *Front Mol Neurosci.* 2018 Feb 22;11:51. Application: Mouse hippocampal lysates, acid-extracted.

Polacchini A et al. (2018) Distinct CCL2, CCL5, CCL11, CCL27, IL17, IL6, BDNF serum profiles correlate to different job-stress outcomes. *Neurobiol Stress.* [In press] doi.org/10.1016/j.ynstr.2018.02.002. Application: Human serum.

Rault JJ et al. (2017) Brain-derived neurotrophic factor as an indicator of environmental enrichment effectiveness. Report prepared for the Co-operative Research Centre (CRC) for High Integrity Australian Pork. Application: Pig serum.

Ng T et al. (2017) Evaluation of plasma brain-derived neurotrophic factor levels and self-perceived cognitive impairment post-chemotherapy: a longitudinal study. *BMC Cancer.* 17(1):867 doi.org/10.1186/s12885-017-3861-9. Application: Human plasma.

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Reidling JC et al. (2017) Human Neural Stem Cell Transplantation Rescues Functional Deficits in R6/2 and Q140 Huntington's Disease Mice. *Stem Cell Reports*. [In press] doi.org/10.1016/j.stemcr.2017.11.005. Application: Mouse brain homogenates.

Perricos A et al. (2017) Increased serum levels of mBDNF in women with minimal and mild endometriosis have no predictive power for the disease. *Exp Biol Med (Maywood)*. [Epub ahead of print] doi: 10.1177/1535370217742600. Application: Human serum.

Inoue T et al. (2017) Effects of long-term exercise and low-level inhibition of GABAergic synapses on motor control and the expression of BDNF in the motor related cortex. *Neurol Res*. 11:1-8 doi: 10.1080/01616412.2017.1382801. Application: Mouse brain homogenates.

Pedard M et al. (2017) Brain-derived neurotrophic factor in adjuvant-induced arthritis in rats. Relationship with inflammation and endothelial dysfunction. *Prog Neuropsychopharmacol Biol Psychiatry*. pii: S0278-5846(17)30730-3; [Epub ahead of print] doi: 10.1016/j.pnpbp.2017.11.006. Application: Rat serum.

Wu YJ et al. (2017) Repeated transcranial direct current stimulation improves cognitive dysfunction and synaptic plasticity deficit in the prefrontal cortex of streptozotocin-induced diabetic rats. *Brain Stimul*. 2017 Aug 24; [Epub ahead of print] doi: 10.1016/j.brs.2017.08.007. Application: Rat brain homogenates.

Yotova I et al. (2017) Epigenetic Alterations Affecting Transcription Factors and Signaling Pathways in Stromal Cells of Endometriosis. *PLoS One*. 2017 Jan 26;12(1):e0170859. doi: 10.1371/journal.pone.0170859. Application: Human primary cell line supernatants.

Guerzoni LPB et al. (2016) In Vitro Modulation of TrkB Receptor Signaling upon Sequential Delivery of Curcumin-DHA Loaded Carriers Towards Promoting Neuronal Survival. *Pharm Res*. [Epub ahead of print]. doi:10.1007/s11095-016-2080-4. Application: Human cell line supernatants and RIPA extracts.

Riffault B et al. (2016) Pro-Brain-Derived Neurotrophic Factor (proBDNF)-Mediated p75NTR Activation Promotes Depolarizing Actions of GABA and Increases Susceptibility to Epileptic Seizures. *Cereb. Cortex* [Epub ahead of print]. doi: 10.1093/cercor/bhw385. Application: Rat cortex and hippocampus RIPA extracts.

Khaing ZZ et al. (2016) Localized and Sustained Release of Brain-Derived Neurotrophic Factor from Injectable Hydrogel/Microparticle Composites Fosters Spinal Learning after Spinal Cord Injury. *J Mater Chem B*. [Epub ahead of print]. doi: 10.1039/C6TB01602B. Application: In vitro release of BDNF from HAMC hydrogels.

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Turnbull MT and Coulson EJ (2016) Cholinergic Basal Forebrain Lesion Decreases Neurotrophin Signaling without Affecting Tau Hyperphosphorylation in Genetically Susceptible Mice. *J Alzheimers Dis.* [Epub ahead of print]. doi: 10.3233/JAD-160805. Application: Mouse hippocampus extracts.

Brandli A et al. (2016) Remote Ischemic Preconditioning Protects Retinal Photoreceptors: Evidence From a Rat Model of Light-Induced Photoreceptor Degeneration. *Invest Ophthalmol Vis Sci.* 57(13):5302-13. doi: 10.1167/iovs.16-19361. Application: Rat serum and retinal RIPA extracts.

Chrysostomou V et al. (2016) Exercise reverses age-related vulnerability of the retina to injury by preventing complement-mediated synapse elimination via a BDNF-dependent pathway. *Ageing Cell.* 2016 Sep 9. doi: 10.1111/ace.12512. [Epub ahead of print]. Application: Mouse serum, mouse retina and mouse muscle homogenates (Tris/Triton buffer).

Uys M et al. (2016) The α -adrenoceptor antagonist, ORM-10,921, has antipsychotic-like effects in social isolation reared rats and bolsters the effects of haloperidol. *Prog Neuropsychopharmacol Biol Psychiatry.* 2016 Jul 2. pii: S0278-5846(16)30105-1. doi: 10.1016/j.pnpbp.2016.07.002. [Epub ahead of print]. Application: Acid-extracted rat brain homogenate.

Polacchini A et al. (2015) A method for reproducible measurements of serum BDNF: comparison of the performance of six commercial assays. *Sci Rep.* 10;5:17989. doi: 10.1038/srep17989. Application: Human serum.

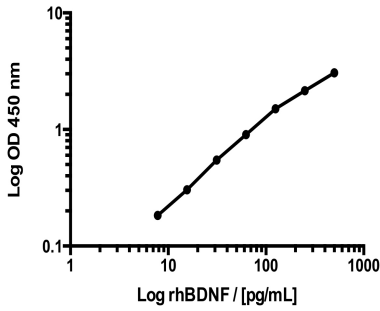
Hutton CP et al. (2015) Synergistic effects of diet and exercise on hippocampal function in chronically stressed mice. *Neuroscience* 308:180-93. doi: 10.10166. Application: Mouse serum.

Boskovic Z et al. (2014) The role of p75NTR in cholinergic basal forebrain structure and function. *J Neurosci.* 34(39):13033-8. doi: 10.1523/JNEUROSCI.2364-14.2014. Application: Mouse brain homogenates.

Kit components:	The ELISA kit box contains 2 x 96-well pre-coated strip plates, protein standards, QC sample, detection reagents, wash and sample buffers, substrate buffer and detailed protocols.
Range:	7.8 pg/mL - 500 pg/mL
Sensitivity:	Typical limit of detection (LOD) for BDNF is less than 2 pg/mL, determined as 150% of the blank value.
Kit protocol:	Please refer to our online product listing for current protocol/MSDS versions.
MSDS:	Please refer to our online product listing for current protocol/MSDS versions.

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This standard curve generated in our laboratories is for demonstration purposes only, but can be used as a guide to expected performance. A standard curve should be generated for each assay.

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