

BDNF proDomain Protein (Val66Met)
Neurotrophic Factor
Catalog # PG10006**Specification**

BDNF proDomain Protein (Val66Met) - Product Information**BDNF proDomain Protein (Val66Met) - Additional Information****Storage**
-20°C**Precautions**

BDNF proDomain Protein (Val66Met) is for research use only and not for use in diagnostic or therapeutic procedures.

BDNF proDomain Protein (Val66Met) - Protocols

Provided below are standard protocols that you may find useful for product applications.

- [Western Blot](#)
- [Blocking Peptides](#)
- [Dot Blot](#)
- [Immunohistochemistry](#)
- [Immunofluorescence](#)
- [Immunoprecipitation](#)
- [Flow Cytometry](#)
- [Cell Culture](#)

BDNF proDomain Protein (Val66Met) - Images**BDNF proDomain Protein (Val66Met) - Background**

Brain-derived neurotrophic factor (BDNF) is a neurotrophic factor that binds p75NTR as well as TrkB receptors^{1,2}. BDNF supports the survival of many cell types³⁻⁸ and also modulates hippocampal plasticity and hippocampal-dependent memory in cell models and in animals⁹. The BDNF gene, like other peptide growth factors, encodes a precursor peptide (proBDNF), which is proteolytically cleaved to form the mature protein¹⁰. proBDNF has been shown to be a pro-apoptotic ligand for sympathetic neurons expressing both p75NTR and sortilin¹¹, and to be involved in long-term potentiation (LTP) stage of the memory-related modifications in synaptic transmission¹². A nonconservative single nucleotide polymorphism (SNP) in the human BDNF gene has been identified at nucleotide 196 (G/A) producing an amino acid substitution (Valine to Methionine) at codon 66 (Val66Met, rs 6265). Although located in the 5' pro-BDNF region, this SNP resulted in striking deficits in the cellular distribution and regulated secretion of the mature protein, BDNF and hence in corresponding alterations of human hippocampal function and episodic memory in vivo⁹. Egan M.F. et al demonstrated the molecular mechanisms that control activity-dependent BDNF secretion and showed that depolarization-dependent secretion of BDNF in hippocampal neurons is significantly impaired when this Val66Met SNP occurs. Using double-staining techniques, they demonstrated that Val-BDNF-containing secretory granules are colocalized with

synaptophysin, a marker for synapses. In contrast, Val66Met-BDNF aggregates are accumulated in the cell body and rarely colocalize with synaptophysin. This suggests that even if it can be secreted in small amounts near the cell body through the constitutive pathway, the Met-BDNF protein cannot be secreted at synapses⁹. Studies of heterozygote BDNF knockout rodents, who presumably have intermediate BDNF levels, demonstrate clear physiological¹³ and behavioral¹⁴ abnormalities, suggesting that secretion levels are critical. Multiple studies over the recent decades in humans, in vivo in animal models and in vitro found an association between the Val66Met polymorphism and bipolar and unipolar disorders¹⁵, Schizophrenia^{16, 17}, anxiety-related behavior^{18,19} and controversial association with ADHD^{20,21}. The data emerged from the analysis of the Val66Met phenotype in various syndroms and diseases reveal the importance of the pro-region of the BDNF polypeptide, particular Valine66 and perhaps the nearby sequence, in intracellular trafficking and secretion of BDNF.

BDNF proDomain Protein (Val66Met) - References

1 . Tolkovsky, A. (1997)Trends Neurosci.20,1.2 . Jing, S.et al.(1992)Neuron9,1067.3 . Acheson, A.et al.(1995)Nature374,450.4 . Morse, J.K.et al.(1993)J. Neurosci.13,4146.5 . Hyman, C.et al.(1991)Nature350,230.6 . Friedman, B.et al.(1995)J. Neurosci.15,1044.7 . Meyer, M.et al.(1992)J. Cell Biol.119,45.8 . Koliatsos, V.E. et al.(1993)Neuron10,359.9 . Egan, M.F.et al.(2003)Cell112,257.10 . Seidah, N.G.et al.(1996)FEBS Lett.379,247.11 . Teng, H.K. et al.(2005)J. Neurosci.25,5455.12 . Woo, N.H.et al.(2005)Nat. Neurosci.8,1069.13 . Korte, M.et al.(1995)Proc. Natl. Acad. Sci. U.S.A.92,8856.14 . Lyons, W.E. et al.(1999)Proc. Natl. Acad. Sci. U.S.A. 96,15239.15 . Post, R.M.(2007)J. Psychiatric Res.41,979.16 . Ho, B.C.et al.(2006)Arch. Gen. Psychiatry63,731.17 . Rosa, A.et al.(2006)Am. J. Med. Gen. B Neuropsych. Gen.141B,135.18 . Hashimoto, K.(2007)BioEssays29,116.19 . Chen Z.Y.et al.(2006)Science314,140.20 . Kent, L.et al.(2005)Mol. Psychiatry 10, 939.21 . Sanchez-Mora C.et al.(2010)Am. J. Med. Gen. B Neuropsych. Gen. 153B,512.