

GDNF Protein, Rat (sf9, His)

Cat. No.:	HY-P73075
Synonyms:	Glial cell line-derived neurotrophic factor; ATF; HFB1-GDNF; HGDNF; HSCR3
Species:	Rat
Source:	Sf9 insect cells
Accession:	Q07731-1 (S78-I211)
Gene ID:	25453
Molecular Weight:	Approximately 20 kDa

PROPERTIES

AA Sequence	<p>S P D K Q A A A L P R R E R N R Q A A A A S P E N S R G K G R R G Q R G K N R G</p> <p>C V L T A I H L N V T D L G L G Y E T K E E L I F R Y C S G S C E A A E T M Y D</p> <p>K I L K N L S R S R R L T S D K V G Q A C C R P V A F D D D L S F L D D S L V Y</p> <p>H I L R K H S A K R C G C I</p>
Biological Activity	<p>1. Measured in a cell proliferation assay using SH-SY5Y human neuroblastoma cells. The ED₅₀ is typically ≤50 ng/mL in the presence of Rat GFR alpha-1/GDNF R alpha-1 His Chimera.</p> <p>2. Immobilized GDNF Protein, Rat (sf9, His) at 10 µg/mL (100 µl/well) can bind rat GFRA1-Fc and the EC₅₀ is 20-46.6 ng/mL.</p>
Appearance	Lyophilized powder.
Formulation	Lyophilized from a 0.2 µm filtered solution of 20 mM Tris, 500 mM NaCl, pH 7.4. Normally 5% - 8% trehalose, mannitol and 0.01% Tween 80 are added as protectants before lyophilization.
Endotoxin Level	<1 EU/µg, determined by LAL method.
Reconstitution	It is not recommended to reconstitute to a concentration less than 100 µg/mL in ddH ₂ O.
Storage & Stability	Stored at -20°C for 2 years. After reconstitution, it is stable at 4°C for 1 week or -20°C for longer (with carrier protein). It is recommended to freeze aliquots at -20°C or -80°C for extended storage.
Shipping	Room temperature in continental US; may vary elsewhere.

DESCRIPTION

Background	<p>Glial cell line-derived neurotrophic factor (GDNF) is a 134 amino acid protein belonging in the GDNF family ligands (GFLs). GDNF protein is widely distributed throughout both the central and peripheral nervous systems. Synthesis and secretion of GDNF occur in many cell types such as glial cells like astrocytes, oligodendrocytes, and Schwann cells; motor neurons (MNs); and skeletal muscle^[1].</p>
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Mature human GDNF shares 91-92% amino acid sequence identity with mouse, rat, and Canine GDNF proteins. While, mouse GDNF shares 99% aa sequence identity with rat GDNF protein.

GDNF is originally isolated from cultured B49 rat glial cells and found to enhance the survival and differentiation of dopaminergic neurons in primary cultures by promoting dopamine uptake. Similar to other members of the TGF- β superfamily, GDNF is first synthesized as a precursor protein (pro-GDNF). After a series of protein cleavage and processing, the 211 amino acid pro-GDNF is finally converted into the active and mature form of GDNF. GDNF has the ability to trigger receptor tyrosine kinase RET phosphorylation, whose downstream effects have been found to promote neuronal health and survival. The binding of GDNF to its receptors triggers several intracellular signaling pathways which play roles in promoting the development, survival, and maintenance of neuron-neuron and neuron-target tissue interactions. The synthesis and regulation of GDNF have been shown to be altered in many diseases, aging, exercise, and addiction. The neuroprotective effects of GDNF may be used to develop treatments and therapies to ameliorate neurodegenerative diseases such as amyotrophic lateral sclerosis (ALS)^[1].

GDNF is a potent neurotrophic factor for regulating MN survival in the peripheral nervous system. GDNF prevents apoptosis of MNs during development in vivo, decreases the loss of MNs in animal models of motor neuropathy and degeneration, rescues MNs from axotomy-induced cell death, and protects MNs from chronic degeneration. Intracerebral GDNF administration exerts both protective and reparative effects on the nigrostriatal dopamine system, which may have implications for the development of new treatment strategies for Parkinson's disease^{[1][2]}.

REFERENCES

- [1]. Alberto F Cintrón-Colón, et al. GDNF synthesis, signaling, and retrograde transport in motor neurons. *Cell Tissue Res.* 2020 Oct;382(1):47-56.
- [2]. Tomac A, et al. Protection and repair of the nigrostriatal dopaminergic system by GDNF in vivo. *Nature.*1995;373 (6512): 335-339.
- [3]. Shizuka Takaku, et al. GDNF promotes neurite outgrowth and upregulates galectin-1 through the RET/PI3K signaling in cultured adult rat dorsal root ganglion neurons. *Neurochem Int.* 2013 Feb;62(3):330-9.
- [4]. Piotr Hadaczek, et al. Pharmacokinetics and bioactivity of glial cell line-derived factor (GDNF) and neurturin (NTN) infused into the rat brain. *Neuropharmacology.* 2010 Jun;58(7):1114-21.
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