SANTA CRUZ BIOTECHNOLOGY, INC.

BDNF siRNA (h): sc-42121

BACKGROUND

Neurotrophins function to regulate naturally occurring cell death of neurons during development. The prototype neurotrophin is nerve growth factor (NGF), originally discovered in the 1950s as a soluble peptide promoting the survival of, and neurite outgrowth from, sympathetic ganglia. Three additional structurally homologous neurotrophic factors have been identified. These include brain-derived neurotrophic factor (BDNF), neurotrophin-3 (NT-3) and neurotrophin-4 (NT-4) (also designated NT-5). These various neurotrophins stimulate the *in vitro* survival of distinct, but partially overlapping, populations of neurons. The cell surface receptors through which neurotrophins mediate their activity have been identified. For instance, the Trk A receptor is the preferential receptor for NGF, but also binds NT-3 and NT-4. The Trk B receptor binds both BDNF and NT-4 equally well, and binds NT-3 to a lesser extent, while the Trk C receptor only binds NT-3.

REFERENCES

1. Oppenhem, R.W., et al. 1991. Cell death during development of the nervous system. Annu. Rev. Neurosci. 14: 453-501.
2. Thoenen, H., et al. 1991. The changing scene of neurotrophic factors. Trends Neurosci. 14: 165-170.
3. Chao, M.V., et al. 1992. Neurotrophin receptors: a window into neuronal differentiation. Neuron 9: 583-593.

CHROMOSOMAL LOCATION

Genetic locus: BDNF (human) mapping to 11p14.1.

PRODUCT

BDNF siRNA (h) is a pool of 3 target-specific 19-25 nt siRNAs designed to knock down gene expression. Each vial contains 3.3 nmol of lyophilized siRNA, sufficient for a 10 µM solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see BDNF shRNA Plasmid (h): sc-42121-SH and BDNF shRNA (h) Lentiviral Particles: sc-42121-V as alternate gene silencing products.

For independent verification of BDNF (h) gene silencing results, we also provide the individual siRNA duplex components. Each is available as 3.3 nmol of lyophilized siRNA. These include: sc-42121A, sc-42121B and sc-42121C.

STORAGE AND RESUSPENSION

Store lyophilized siRNA duplex at -20° C with desiccant. Stable for at least one year from the date of shipment. Once resuspended, store at -20° C, avoid contact with RNAses and repeated freeze thaw cycles.

Resuspend lyophilized siRNA duplex in 330 µl of the RNAse-free water provided. Resuspension of the siRNA duplex in 330 µl of RNAse-free water makes a 10 µM solution in a 10 µM Tris-HCl, pH 8.0, 20 mM NaCl, 1 mM EDTA buffered solution.

APPLICATIONS

BDNF siRNA (h) is recommended for the inhibition of BDNF expression in human cells.

SUPPORT REAGENTS

For optimal siRNA transfection efficiency, Santa Cruz Biotechnology's siRNA Transfection Reagent: sc-29528 (0.3 ml), siRNA Transfection Medium: sc-36868 (20 ml) and siRNA Dilution Buffer: sc-29527 (1.5 ml) are recommended. Control siRNAs or Fluorescein Conjugated Control siRNAs are available as 10 µM in 66 µl. Each contain a scrambled sequence that will not lead to the specific degradation of any known cellular mRNA. Fluorescein Conjugated Control siRNAs include: sc-36869, sc-44239, sc-44240 and sc-44241. Control siRNAs include: sc-37007, sc-44230, sc-44231, sc-44232, sc-44233, sc-44234, sc-44235, sc-44236, sc-44237 and sc-44238.

GENE EXPRESSION MONITORING

pro BDNF (5H8): sc-65514 is recommended as a control antibody for monitoring of BDNF gene expression knockdown by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000) or immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500).

RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor BDNF gene expression knockdown using RT-PCR Primer: BDNF (h)-PR: sc-42121-PR (20 µl, 441 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Snapyan, M., et al. 2009. Vasculature guides migrating neuronal precursors in the adult mammalian forebrain via brain-derived neurotrophic factor signaling. J. Neurosci. 29: 4172-4188.
2. Kwapiszewska, G., et al. 2012. BDNF/Trk B signaling augments smooth muscle cell proliferation in pulmonary hypertension. Am. J. Pathol. 181: 2018-2029.
3. Ahn, S.Y., et al. 2017. Pivotal role of brain-derived neurotrophic factor secreted by mesenchymal stem cells in severe intraventricular hemorrhage in newborn rats. Cell Transplant. 26: 145-156.
4. Ko, H.R., et al. 2018. Human UCB-MSCs treatment upon intraventricular hemorrhage contributes to attenuate hippocampal neuron loss and circuit damage through BDNF-CREB signaling. Stem Cell Res. Ther. 9: 326.
5. Ahn, S.Y., et al. 2021. Brain-derived neurotropic factor mediates neuroprotection of mesenchymal stem cell-derived extracellular vesicles against severe intraventricular hemorrhage in newborn rats. Stem Cells Transl. Med. 10: 374-384.
6. Bao, L., et al. 2023. BDNF/Trk B confers bortezomib resistance in multiple myeloma by inducing BRINP3. Biochim. Biophys. Acta Gen. Subj. 1867: 130299.
7. Tian, J., et al. 2023. SLERT, as a novel biomarker, orchestrates endometrial cancer metastasis via regulation of BDNF/TRKB signaling. World J. Surg. Oncol. 21: 27.

RESEARCH USE

For research use only, not for use in diagnostic procedures.