SANTA CRUZ BIOTECHNOLOGY, INC.

BNIP-3 siRNA (h): sc-37451

BACKGROUND

The adenovirus E1B protein is a viral homolog of the Bcl-2 family of proteins that are involved in regulating cell death. A family of interacting proteins, which are designated Nip or Bnip and include BNIP-1, BNIP-2, BNIP-3 and Nix, associate with both the E1B protein and Bcl-2 proteins to mediate apoptotic signaling. BNIP-1 contains a hydrophobic transmembrane domain, which enables its localization to the nuclear envelope, endoplasmic recticulum and mitochondria. BNIP-2, (previously designated Nip2 and Nip21 in human and mouse respectively), shares homology with the non-catalytic domain of Cdc42 GTPase-activating protein (Cdc42GAP). Through binding to Cdc42GAP, BNIP-2 enhances the GTPase activity of Cdc42GAP, facilitating the hydrolysis of GTP bound to Cdc42 and thereby, mediating the signaling pathways involving receptor kinases, small GTPases and apoptotic proteins. Nix, which is also designated Nip3L or Bnip3L, is highly related to BNIP-3, and both proteins localize to the mitochondria where they associate with Bcl-2 proteins. BNIP-3 preferentially binds to Bcl-x_L and induces apoptosis by suppressing the anti-apoptosis activity of Bcl-x_L.

CHROMOSOMAL LOCATION

Genetic locus: BNIP3 (human) mapping to 10q26.3.

PRODUCT

BNIP-3 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 BNIP-3 shRNA Plasmid (h): sc-37451-SH and BNIP-3 shRNA (h) Lentiviral Particles: sc-37451-V as alternate gene silencing products.

For independent verification of BNIP-3 (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-37451A, sc-37451B and sc-37451C.

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

BNIP-3 siRNA (h) is recommended for the inhibition of BNIP-3 expression in human cells.

PROTOCOLS

See our web site at www.scbt.com for detailed protocols and support products.

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

BNIP-3 (ANa40): sc-56167 is recommended as a control antibody for monitoring of BNIP-3 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 BNIP-3 gene expression knockdown using RT-PCR Primer: BNIP-3 (h)-PR: sc-37451-PR (20 µl, 482 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Kong, D.K., et al. 2010. Deficiency of the transcriptional regulator p8 results in increased autophagy and apoptosis, and causes impaired heart function. Mol. Biol. Cell 21: 1335-1349.
2. Liu, F., et al. 2011. Verticillin A overcomes apoptosis resistance in human colon carcinoma through DNA methylation-dependent upregulation of BNIP3. Cancer Res. 71: 6807-6816.
3. Prieto-Domínguez, N., et al. 2017. Melatonin enhances Sorafenib actions in human hepatocarcinoma cells by inhibiting mTORC1/p70S6K/HIF-1α and hypoxia-mediated mitophagy. Oncotarget 8: 91402-91414.
4. Shi, C., et al. 2018. Yap promotes hepatocellular carcinoma metastasis and mobilization via governing Cofilin/F-Actin/lamellipodium axis by regulation of JNK/BNIP3/SERCA/CaMKII pathways. Redox Biol. 14: 59-71.
5. Peng, F., et al. 2019. Aconitine induces cardiomyocyte damage by mitigating BNIP3-dependent mitophagy and the TNFα-NLRP3 signalling axis. Cell Prolif. 53: e12701.
6. Thayyullathil, F., et al. 2020. Par-4 regulates autophagic cell death in human cancer cells via upregulating p53 and BNIP3. Biochim. Biophys. Acta Mol. Cell Res. 1867: 118692.
7. Fu, Z.J., et al. 2020. HIF-1α-BNIP3-mediated mitophagy in tubular cells protects against renal ischemia/reperfusion injury. Redox Biol. 36: 101671.

RESEARCH USE

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