SANTA CRUZ BIOTECHNOLOGY, INC.

caspase-3 siRNA (h): sc-29237

BACKGROUND

Caspase-3, also known as apopain, SCA-1, Yama and CPP32, is an aspartate-specific cysteine protease that belongs to the ICE subfamily of caspases. Caspase-3 is expressed in cells as an inactive precursor from which the p17 and p11 subunits of the mature caspase-3 are proteolytically generated during apoptosis. The caspase-3 precursor is first cleaved at Asp175-Ser176 to produce the p11 subunit and the p20 peptide. Subsequently, the p20 peptide is cleaved at Asp28-Ser29 to generate the mature p17 subunit. The active caspase-3 enzyme is a heterodimer composed of two p17 and two p11 subunits. At the onset of apoptosis, caspase-3 proteolytically cleaves PARP at an Asp216-Gly217 bond. During the execution of the apoptotic cascade, activated caspase-3 releases SREBP from the membrane of the ER in a proteolytic reaction that is distinct from their normal sterol-dependent activation. Caspase-3 cleaves and activates SREBPs between the basic helix-loop-helix leucine zipper domain and the membrane attachment domain. Caspase-3 also cleaves and activates caspase-6, -7 and -9. The human caspase-3 gene encodes a cytoplasmic protein that is highly expressed in lung, spleen, heart, liver, kidney and cells of the immune system.

REFERENCES

1. Nicholson, D., et al. 1995. Identification and inhibition of the ICE/CED-3 protease necessary for mammalian apoptosis. Nature 37: 37-43.
2. Cohen, G.M. 1997. Caspases: the executioners of apoptosis. Biochem. J. 326: 1-16.

CHROMOSOMAL LOCATION

Genetic locus: CASP3 (human) mapping to 4q35.1.

PRODUCT

caspase-3 siRNA (h) is a target-specific 19-25 nt siRNA 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 caspase-3 shRNA Plasmid (h): sc-29237-SH and caspase-3 shRNA (h) Lentiviral Particles: sc-29237-V as alternate gene silencing products.

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

caspase-3 siRNA (h) is recommended for the inhibition of caspase-3 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

caspase-3 (E-8): sc-7272 is recommended as a control antibody for monitoring of caspase-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 caspase-3 gene expression knockdown using RT-PCR Primer: caspase-3 (h)-PR: sc-29237-PR (20 µl, 579 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Lopergolo, A., et al. 2009. Apollon gene silencing induces apoptosis in breast cancer cells through p53 stabilisation and caspase-3 activation. Br. J. Cancer 100: 739-746.
2. Dong, Y., et al. 2014. Involvement of autophagy induction in penta-1,2,3,4,6-O-galloyl-β-D-glucose-induced senescence-like growth arrest in human cancer cells. Autophagy 10: 296-310.
3. Iitaka, D., et al. 2015. PKCδ-iPLA$_2$-PGE2-PPARγ signaling cascade mediates TNF-α induced claudin 1 expression in human lung carcinoma cells. Cell. Signal. 27: 568-577.
4. Rahman, M.A., et al. 2016. *Angelica polymorpha* Maxim induces apoptosis of human SH-SY5Y neuroblastoma cells by regulating an intrinsic caspase pathway. Mol. Cells 39: 119-128.
5. Yan, X. and Su, H. 2017. YM155 down-regulates survivin and induces P53 up-regulated modulator of apoptosis (PUMA)-dependent in oral squamous cell carcinoma cells. Med. Sci. Monit. 23: 1963-1972.
6. Heijink, A.M., et al. 2019. BRCA2 deficiency instigates cGAS-mediated inflammatory signaling and confers sensitivity to tumor necrosis factor-α-mediated cytotoxicity. Nat. Commun. 10: 100.
7. Xu, W.F., et al. 2020. Gasdermin E-derived caspase-3 inhibitors effectively protect mice from acute hepatic failure. Acta Pharmacol. Sin. E-published.

RESEARCH USE

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