SANTA CRUZ BIOTECHNOLOGY, INC.

Calpain 1 siRNA (m): sc-29886

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The Power to Question

BACKGROUND

Calpain 1, also designated μ-calpain, is an intracellular calcium-dependent protease that cleaves cytoskeletal and submembranous proteins. Calpains are nonlysosomal, calcium-activated intracellular cysteine proteases. Calpains mediate specific Ca^{2+}-dependent processes including cell fusion, mitosis and meiosis. Calpains are heterodimers of a small regulatory subunit and one of three large catalytic subunits, designated Calpain 1, Calpain 2 and Calpain p94. Calpastatin regulates Calpain by inhibiting both the proteolytic activity of Calpain and its binding to membranes. Calpastatin exists in two types, tissue type and erythrocyte type, resulting from both alternative splicing and proteolytic processing. Calpain-1 co-localizes with human leukocyte antigen-DR (HLA-DR) on activated microglia in the aging brain. Calpain influences the process of spermatogenesis and the events preceding fertilization, such as the acrosome reaction.

REFERENCES

1. Murachi, T. 1984. Calcium-dependent proteinases and specific inhibitors: Calpain and Calpastatin. Biochem. Soc. Symp. 45: 149-167.
2. Takano, E., et al. 1991. Molecular diversity of erythrocyte calpastatin. Biomed. Biochim. Acta 50: 517-521.
3. Takano, E., et al. 1993. Molecular diversity of Calpastatin in human erythroid cells. Arch. Biochem. Biophys. 303: 349-354.

CHROMOSOMAL LOCATION

Genetic locus: Capn1 (mouse) mapping to 19 A.

PRODUCT

Calpain 1 siRNA (m) 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 Calpain 1 shRNA Plasmid (m): sc-29886-SH and Calpain 1 shRNA (m) Lentiviral Particles: sc-29886-V as alternate gene silencing products.

For independent verification of Calpain 1 (m) gene silencing results, we also provide the individual siRNA duplex components. Each is available as 3.3 nmol of lyophilized siRNA. These include: sc-29886A, sc-29886B and sc-29886C.

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

Calpain 1 siRNA (m) is recommended for the inhibition of Calpain 1 expression in mouse 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

Calpain 1 (D-11): sc-271313 is recommended as a control antibody for monitoring of Calpain 1 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 Calpain 1 gene expression knockdown using RT-PCR Primer: Calpain 1 (m)-PR: sc-29886-PR (20 µl, 449 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Touma, E., et al. 2007. Calpain-mediated cleavage of collapsin response mediator protein(CRMP)-2 during neurite degeneration in mice. Eur. J. Neurosci. 26: 3368-3381.
2. Hu, H., et al. 2009. Calpain-1 induces apoptosis in pulmonary microvascular endothelial cells under septic conditions. Microvasc. Res. 78: 33-39.
3. Nawabi, H., et al. 2010. A midline switch of receptor processing regulates commissural axon guidance in vertebrates. Genes Dev. 24: 396-410.
4. Yamada, K.H., et al. 2012. Targeted gene inactivation of Calpain-1 suppresses cortical degeneration due to traumatic brain injury and neuronal apoptosis induced by oxidative stress. J. Biol. Chem. 287: 13182-13193.
5. Liu, D., et al. 2012. Activation of calpains mediates early lung neutrophilic inflammation in ventilator-induced lung injury. Am. J. Physiol. Lung Cell. Mol. Physiol. 302: L370-L379.
6. Ding, F., et al. 2016. Calpain-mediated cleavage of calcineurin in puromycin aminonucleoside-induced podocyte injury. PLoS ONE 11: e0155504.
7. Sheu, M.L., et al. 2017. Ochratoxin A induces ER stress and apoptosis in mesangial cells via a NADPH oxidase-derived reactive oxygen species-mediated Calpain activation pathway. Oncotarget 8: 19376-19388.
8. Chiu, C.S., et al. 2018. Exploiting honokiol-induced ER stress CHOP activation inhibits the growth and metastasis of melanoma by suppressing the MITF and β-catenin pathways. Cancer Lett. 442: 113-125.

RESEARCH USE

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