

Calpain 1 siRNA (h): sc-29885

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 (human) mapping to 11q13.1.

PRODUCT

Calpain 1 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 Calpain 1 shRNA Plasmid (h): sc-29885-SH and Calpain 1 shRNA (h) Lentiviral Particles: sc-29885-V as alternate gene silencing products.

For independent verification of Calpain 1 (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-29885A, sc-29885B and sc-29885C.

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 (h) is recommended for the inhibition of Calpain 1 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

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 (h)-PR: sc-29885-PR (20 μl , 494 bp). Annealing temperature for the primers should be $55-60^{\circ}\text{C}$ and the extension temperature should be $68-72^{\circ}\text{C}$.

SELECT PRODUCT CITATIONS

1. Sheu, M.L., et al. 2007. Honokiol induces Calpain-mediated glucose-regulated protein 94 cleavage and apoptosis in human gastric cancer cells and reduces tumor growth. *PLoS ONE* 2: e1096.
2. Tang, C.H., et al. 2009. Arsenic induces cell apoptosis in cultured osteoblasts through endoplasmic reticulum stress. *Toxicol. Appl. Pharmacol.* 241: 173-181.
3. Prangsaengtong, O., et al. 2012. Calpain 1 and -2 play opposite roles in cord formation of lymphatic endothelial cells via eNOS regulation. *Hum. Cell* 25: 36-44.
4. Miners, J.S., et al. 2014. Accumulation of α -synuclein in dementia with Lewy bodies is associated with decline in the α -synuclein-degrading enzymes kallikrein-6 and Calpain-1. *Acta Neuropathol. Commun.* 2: 164.
5. Michel, L.Y., et al. 2016. Calpain-3-mediated regulation of the Na^{+} - Ca^{2+} exchanger isoform 3. *Pflugers Arch.* 468: 243-255.
6. 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.
7. Matos, A.M., et al. 2019. Inhibition of Calpain 1 restores plasma membrane stability to pharmacologically rescued Phe508del-CFTR variant. *J. Biol. Chem.* 294: 13396-13410.
8. Shinkai-Ouchi, F., et al. 2020. Calpain-2 participates in the process of calpain-1 inactivation. *Biosci. Rep.* 40: BSR20200552.

RESEARCH USE

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