SANTA CRUZ BIOTECHNOLOGY, INC.

SUMO-1 siRNA (h): sc-29498

BACKGROUND

The small ubiquitin-related modifier (SUMO) proteins, which include SUMO-1, SUMO-2 and SUMO-3, belong to the ubiquitin-like protein family. Like ubiquitin, the SUMO proteins are synthesized as precursor proteins that undergo processing before conjugation to target proteins. Also, both utilize the E1, E2, and E3 cascade enzymes for conjugation. However, SUMO and ubiquitin differ with respect to targeting. Ubiquitination predominantly targets proteins for degradation, whereas sumoylation targets proteins to a variety of cellular processing, including nuclear transport, transcriptional regulation, apoptosis and protein stability. The unconjugated SUMO-1, SUMO-2 and SUMO-3 proteins localize to the nuclear membrane, nuclear bodies and cytoplasm, respectively. SUMO-1 utilizes Ubc9 for conjugation to several target proteins, which include IκBα, MDM2, p53, PML and Ran GAP1. SUMO-2 and SUMO-3 contribute to a greater percentage of protein modification than does SUMO-1, and unlike SUMO-1, they can form polymeric chains. In addition, SUMO-3 regulates β-Amyloid generation and may be critical in the onset or progression of Alzheimer's disease.

CHROMOSOMAL LOCATION

Genetic locus: SUMO1 (human) mapping to 2q33.1.

PRODUCT

SUMO-1 siRNA (h) is a pool of 2 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 SUMO-1 shRNA Plasmid (h): sc-29498-SH and SUMO-1 shRNA (h) Lentiviral Particles: sc-29498-V as alternate gene silencing products.

For independent verification of SUMO-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-29498A and sc-29498B.

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

SUMO-1 siRNA (h) is recommended for the inhibition of SUMO-1 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

SUMO-1 (D-11): sc-5308 is recommended as a control antibody for monitoring of SUMO-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 SUMO-1 gene expression knockdown using RT-PCR Primer: SUMO-1 (h)-PR: sc-29498-PR (20 µl, 432 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Chalkiadaki, A., et al. 2005. SUMO-dependent compartmentalization in promyelocytic leukemia protein nuclear bodies prevents the access of LRH-1 to chromatin. Mol. Cell. Biol. 25: 5095-5105.
2. Yuan, D.Y., et al. 2017. Betulinic acid increases radiosensitization of oral squamous cell carcinoma through inducing Sp1 sumoylation and PTEN expression. Oncol. Rep. 38: 2360-2368.
3. Yuan, Y., et al. 2018. SUMO2/3 modification of activating transcription factor 5 (ATF5) controls its dynamic translocation at the centrosome. J. Biol. Chem. 293: 2939-2948.
4. Lorente, M., et al. 2019. Inhibiting SUMO1-mediated SUMOylation induces autophagy-mediated cancer cell death and reduces tumour cell invasion via RAC1. J. Cell Sci. 132: jcs234120.
5. Benoit, Y.D., et al. 2021. Targeting SUMOylation dependency in human cancer stem cells through a unique SAE2 motif revealed by chemical genomics. Cell Chem. Biol. 28: 1394-1406.e10.
6. Singhal, J., et al. 2022. Host SUMOylation pathway negatively regulates protective immune responses and promotes *Leishmania donovani* survival. Front. Cell. Infect. Microbiol. 12: 878136.
7. Sviercz, F., et al. 2024. The abortive SARS-CoV-2 infection of osteoclast precursors promotes their differentiation into osteoclasts. J. Med. Virol. 96: e29597.

RESEARCH USE

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