SANTA CRUZ BIOTECHNOLOGY, INC.

PARP-1 siRNA (m): sc-29438

BACKGROUND

Poly(ADP-ribose) polymerase-1 (PARP-1), also designated PARP, is a nuclear DNA-binding zinc finger protein that influences DNA repair, DNA replication, modulation of chromatin structure and apoptosis. In response to genotoxic stress, PARP-1 catalyzes the transfer of ADP-ribose units from NAD^+ to a number of acceptor molecules including chromatin. PARP-1 recognizes DNA strand interruptions and can complex with RNA and negatively regulate transcription. Actinomycin D- and etoposide-dependent induction of caspases mediates cleavage of PARP-1 into a p89 fragment that traverses into the cytoplasm. Apoptosis-inducing factor (AIF) translocation from the mitochondria to the nucleus is PARP-1-dependent and is necessary for PARP-1-dependent cell death. PARP-1 deficiencies lead to chromosomal instability due to higher frequencies of chromosome fusions and aneuploidy, suggesting that poly(ADP-ribosyl)ation contributes to the efficient maintenance of genome integrity.

REFERENCES

1. Kaufmann, S.H., et al. 1993. Specific proteolytic cleavage of poly(ADP-ribose) polymerase: an early marker of chemotherapy-induced apoptosis. Cancer Res. 53: 2976-3985.
2. Lazebnik, Y.A., et al. 1994. Cleavage of poly(ADP-ribose) polymerase by a proteinase with properties like ICE. Nature 371: 346-347.
3. Darmon, A.J., et al. 1995. Activation of the apoptotic protease CPP32 by cytotoxic T-cell-derived granzyme B. Nature 377: 446-448.
4. Wang, Z.Q., et al. 1997. PARP is important for genomic stability but dispensable in apoptosis. Genes Dev. 11: 2347-2358.

CHROMOSOMAL LOCATION

Genetic locus: Parp1 (mouse) mapping to 1 H4.

PRODUCT

PARP-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 PARP-1 shRNA Plasmid (m): sc-29438-SH and PARP-1 shRNA (m) Lentiviral Particles: sc-29438-V as alternate gene silencing products.

For independent verification of PARP-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-29438A, sc-29438B and sc-29438C.

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

PARP-1 siRNA (m) is recommended for the inhibition of PARP-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

PARP-1 (F-2): sc-8007 is recommended as a control antibody for monitoring of PARP-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 PARP-1 gene expression knockdown using RT-PCR Primer: PARP-1 (m)-PR: sc-29438-PR (20 µl, 512 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Zeng, L., et al. 2006. HDAC3 is crucial in shear- and VEGF-induced stem cell differentiation toward endothelial cells. J. Cell Biol. 174: 1059-1069.
2. Kim, H.J., et al. 2014. Augmentation of NAD^+ by NQO1 attenuates cisplatin-mediated hearing impairment. Cell Death Dis. 5: e1292.
3. Mohamed, J.S., et al 2014. Dysregulation of SIRT-1 in aging mice increases skeletal muscle fatigue by a PARP-1-dependent mechanism. Aging 6: 820-834.
4. Wang, C., et al. 2018. PARP1 promote autophagy in cardiomyocytes via modulating FoxO3a transcription. Cell Death Dis. 9: 1047.
5. Qi, H., et al. 2018. JWA deficiency induces malignant transformation of murine embryonic fibroblast cells. Exp. Ther. Med. 15: 3509-3515.
6. Tuntevski, K., et al. 2020. Muscle-specific sirtuin1 gain-of-function ameliorates skeletal muscle atrophy in a pre-clinical mouse model of cerebral ischemic stroke. FASEB Bioadv. 2: 387-397.
7. Luan, Y.Y., et al. 2022. STING modulates necrotic cell death in CD4 T cells via activation of PARP-1/PAR following acute systemic inflammation. Int. Immunopharmacol. 109: 108809.

RESEARCH USE

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