

PARP-1 siRNA (h): sc-29437

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.

CHROMOSOMAL LOCATION

Genetic locus: PARP1 (human) mapping to 1q42.12.

PRODUCT

PARP-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 μ M solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see PARP-1 shRNA Plasmid (h): sc-29437-SH and PARP-1 shRNA (h) Lentiviral Particles: sc-29437-V as alternate gene silencing products.

For independent verification of PARP-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-29437A, sc-29437B and sc-29437C.

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 μ l of the RNase-free water provided. Resuspension of the siRNA duplex in 330 μ l of RNase-free water makes a 10 μ M solution in a 10 μ M Tris-HCl, pH 8.0, 20 mM NaCl, 1 mM EDTA buffered solution.

APPLICATIONS

PARP-1 siRNA (h) is recommended for the inhibition of PARP-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 μ M in 66 μ l. 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.

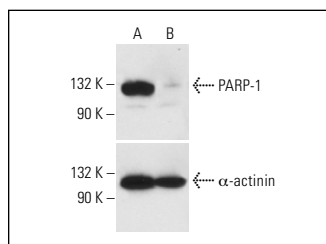
GENE EXPRESSION MONITORING

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).

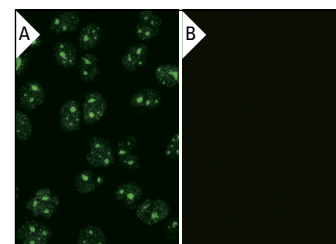
RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor PARP-1 gene expression knockdown using RT-PCR Primer: PARP-1 (h)-PR: sc-29437-PR (20 μ l, 404 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

DATA



PARP-1 siRNA (h): sc-29437. Western blot analysis of PARP-1 expression in non-transfected control (A) and PARP-1 siRNA transfected (B) HeLa cells. Blot probed with PARP-1 (F-2): sc-8007. α -actinin (H-2): sc-17829 used as specificity and loading control.



PARP-1 siRNA (h): sc-29437. Immunofluorescence staining of methanol-fixed, control HeLa (A) and PARP-1 siRNA silenced HeLa (B) cells showing diminished nucleolar staining in the siRNA silenced cells. Cells probed with PARP-1 (F-2): sc-8007.

SELECT PRODUCT CITATIONS

1. Tapodi, A., et al. 2005. Pivotal role of Akt activation in mitochondrial protection and cell survival by poly(ADP-ribose)polymerase-1 inhibition in oxidative stress. *J. Biol. Chem.* 280: 35767-35775.
2. Liu, H., et al. 2018. Nuclear cGAS suppresses DNA repair and promotes tumorigenesis. *Nature* 563: 131-136.
3. Munnur, D., et al. 2019. NR4A nuclear receptors target poly-ADP-ribosylated DNA-PK_{cs} protein to promote DNA repair. *Cell Rep.* 26: 2028-2036.e6.

RESEARCH USE

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