SANTA CRUZ BIOTECHNOLOGY, INC.

PLK4 siRNA (h): sc-61491

BACKGROUND

The Plk (polo-like kinase) family consists of serine/threonine kinases that are closely related to polo and CDC5 proteins, which are required for passage through mitosis in *Drosophila* and *Saccharomyces,* respectively. Polo-like kinases, which include Plk, Snk (serum-inducible kinase, also designated Plk2), Fnk (FGF-inducible kinase, also designated Plk3 or PRK) and PLK4 (also designated Sak), all play a role in cell proliferation. PLK4 differs from other polo-like kinases because it has only a single polo box, which forms a dimer fold that resides in the nucleolus, centrosomes, and the cleavage furrow. PLK4 expression slowly increases during S through M phase, and PLK4 mediates late mitotic progression, cell survival, and postgastrulation embryonic development. APC/C destroys Sak by proteolysis. Reduced PLK4 expression causes increased incidence of apoptosis and anaphase arrest, while haploinsufficiency of the PLK4 gene causes spontaneous tumors to develop, primarily in the liver.

REFERENCES

1. Fode, C., et al. 1994. Sak, a murine protein-serine/threonine kinase that is related to the *Drosophila* polo kinase and involved in cell proliferation. Proc. Natl. Acad. Sci. USA 91: 6388-6392.
2. Hudson, J.W., et al. 2001. Late mitotic failure in mice lacking Sak, a polo-like kinase. Curr. Biol. 11: 441-446.
3. Warnke, S., et al. 2004. Polo-like kinase-2 is required for centriole duplication in mammalian cells. Curr. Biol. 14: 1200-1207.
4. Habedanck, R., et al. 2005. The polo kinase Plk4 functions in centriole duplication. Nat. Cell Biol. 7: 1140-1146.
5. Ko, M.A., et al. 2005. Plk4 haploinsufficiency causes mitotic infidelity and carcinogenesis. Nat. Genet. 37: 883-888.
6. Li, J., et al. 2005. Sak, a new polo-like kinase, is transcriptionally repressed by p53 and induces apoptosis upon RNAi silencing. Neoplasia 7: 312-323.
7. Winkles, J.A. and Alberts, G.F. 2005. Differential regulation of polo-like kinase 1, 2, 3 and 4 gene expression in mammalian cells and tissues. Oncogene 24: 260-266.
8. Myer, D.L., et al. 2005. The Plk3-Cdc25 circuit. Oncogene 24: 299-305.

CHROMOSOMAL LOCATION

Genetic locus: PLK4 (human) mapping to 4q28.2.

PRODUCT

PLK4 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 PLK4 shRNA Plasmid (h): sc-61491-SH and PLK4 shRNA (h) Lentiviral Particles: sc-61491-V as alternate gene silencing products.

For independent verification of PLK4 (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-61491A, sc-61491B and sc-61491C.

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

PLK4 siRNA (h) is recommended for the inhibition of PLK4 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

PLK4 (D-6): sc-518222 is recommended as a control antibody for monitoring of PLK4 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).

To ensure optimal results, the following support reagents are recommended: 1) Western Blotting: use m-IgGκ BP-HRP: sc-516102 or m-IgGκ BP-HRP (Cruz Marker): sc-516102-CM (dilution range: 1:1000-1:10000), Cruz Marker™ Molecular Weight Standards: sc-2035, UltraCruz® Blocking Reagent: sc-516214 and Western Blotting Luminol Reagent: sc-2048. 2) Immunofluorescence: use m-IgGκ BP-FITC: sc-516140 or m-IgGκ BP-PE: sc-516141 (dilution range: 1:50-1:200) with UltraCruz® Mounting Medium: sc-24941 or UltraCruz® Hard-set Mounting Medium: sc-359850.

RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor PLK4 gene expression knockdown using RT-PCR Primer: PLK4 (h)-PR: sc-61491-PR (20 µl). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

RESEARCH USE

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

PROTOCOLS

See our web site at www.scbt.com for detailed protocols and support products.