

# SMC1 $\alpha$ siRNA (h): sc-38385

## BACKGROUND

The SMC (structural maintenance of chromosomes) family of proteins form heterodimeric complexes that modulate sister chromatid cohesion and chromosome condensation for mitosis. SMC1 $\alpha$  (structural maintenance of chromosomes protein 1A), also known as SMC1, SMCB, CDLS2, SB1.8, SMC1L1 or DXS423E, is a 1,233 amino acid nuclear protein that is involved in chromosome cohesion during the cell cycle. SMC1 $\alpha$  interacts with BRCA1 and is phosphorylated by ATM, indicating a potential role in DNA repair. SMC1 $\alpha$  is a component of the cohesion complex, which is required for the cohesion of sister chromatids after DNA replication. Mutations in the gene encoding SMC1 $\alpha$  may be the cause of Cornelia de Lange syndrome (CdLS), which is a clinically heterogeneous developmental disorder characterized by facial dysmorphism, upper limb malformations, growth and cognitive retardation.

## REFERENCES

1. Strunnikov, A.V., et al. 1993. SMC1: an essential yeast gene encoding a putative head-rod-tail protein is required for nuclear division and defines a new ubiquitous protein family. *J. Cell Biol.* 123: 1635-1648.
2. Schmiesing, J.A., et al. 1998. Identification of two distinct human SMC protein complexes involved in mitotic chromosome dynamics. *Proc. Natl. Acad. Sci. USA* 95: 12906-12911.
3. Strunnikov, A.V., et al. 1999. Structural maintenance of chromosomes (SMC) proteins: conserved molecular properties for multiple biological functions. *Eur. J. Biochem.* 263: 6-13.
4. Nishiwaki, T., et al. 1999. Isolation and characterization of a human cDNA homologous to the *Xenopus laevis* XCAP-C gene belonging to the structural maintenance of chromosomes (SMC) family. *J. Hum. Genet.* 4: 197-202.
5. Deardorff, M.A., et al. 2007. Mutations in cohesin complex members SMC3 and SMC1A cause a mild variant of cornelia de Lange syndrome with predominant mental retardation. *Am. J. Hum. Genet.* 80: 485-494.
6. Liu, J. and Krantz, I.D. 2009. Cornelia de Lange syndrome, cohesin, and beyond. *Clin. Genet.* 76: 303-314.
7. Revenkova, E., et al. 2009. Cornelia de Lange syndrome mutations in SMC1A or SMC3 affect binding to DNA. *Hum. Mol. Genet.* 18: 418-427.

## CHROMOSOMAL LOCATION

Genetic locus: SMC1A (human) mapping to Xp11.22.

## PRODUCT

SMC1 $\alpha$  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  $\mu$ M solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see SMC1 $\alpha$  shRNA Plasmid (h): sc-38385-SH and SMC1 $\alpha$  shRNA (h) Lentiviral Particles: sc-38385-V as alternate gene silencing products.

For independent verification of SMC1 $\alpha$  (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-38385A, sc-38385B and sc-38385C.

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

## APPLICATIONS

SMC1 $\alpha$  siRNA (h) is recommended for the inhibition of SMC1 $\alpha$  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  $\mu$ M in 66  $\mu$ 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

SMC1 $\alpha$  (H-6): sc-393171 is recommended as a control antibody for monitoring of SMC1 $\alpha$  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-IgG $\kappa$  BP-HRP: sc-516102 or m-IgG $\kappa$  BP-HRP (Cruz Marker): sc-516102-CM (dilution range: 1:1000-1:10000), Cruz Marker<sup>™</sup> Molecular Weight Standards: sc-2035, UltraCruz<sup>®</sup> Blocking Reagent: sc-516214 and Western Blotting Luminol Reagent: sc-2048. 2) Immunofluorescence: use m-IgG $\kappa$  BP-FITC: sc-516140 or m-IgG $\kappa$  BP-PE: sc-516141 (dilution range: 1:50-1:200) with UltraCruz<sup>®</sup> Mounting Medium: sc-24941 or UltraCruz<sup>®</sup> Hard-set Mounting Medium: sc-359850.

## RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor SMC1 $\alpha$  gene expression knockdown using RT-PCR Primer: SMC1 $\alpha$  (h)-PR: sc-38385-PR (20  $\mu$ l, 545 bp). 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](http://www.scbt.com) for detailed protocols and support products.