SANTA CRUZ BIOTECHNOLOGY, INC.

KIF4A siRNA (h): sc-60888

BACKGROUND

The kinesin superfamily proteins (KIFs) are microtubule-dependent molecular motors that transport membranous organelles and protein complexes in a microtubule- and ATP-dependent manner. Cells use KIFs to tightly control the direction, destination and speed of transportation of a variety of important functional molecules, including mRNA. KIF4A functions as an essential chromosome-associated molecular motor involved in faithful chromosome segregation. It is found in the nucleoplasm during interphase and on condensed chromosome arms during mitosis. KIF4A accumulates in the mid-zone duing late anaphase and on the cytokinetic RING during cytokinesis. KIF4 binds to and translocates PRC1, a spindle mid-zone-associated cyclin-dependent kinase that plays a role in cytokinesis. KIF4A may also interact with the condensin I and II complexes. Loss of KIF4A leads to chromosome hypercondensation, suggesting that it is necessary for retaining normal chromosome architecture.

REFERENCES

1. Nakagawa, T., et al. 1997. Identification and classification of 16 new kinesin superfamily (KIF) proteins in mouse genome. Proc. Natl. Acad. Sci. USA 94: 9654-9659.
2. Miki, H., et al. 2001. All kinesin superfamily protein, KIF, genes in mouse and human. Proc. Natl. Acad. Sci. USA 98: 7004-7011.
3. Online Mendelian Inheritance in Man, OMIM™. 2002. Johns Hopkins University, Baltimore, MD. MIM Number: 300521. World Wide Web URL: http://www.ncbi.nlm.nih.gov/omim/
4. Mazumdar, M., et al. 2004. Human chromokinesin KIF4A functions in chromosome condensation and segregation. J. Cell Biol. 166: 613-620.

CHROMOSOMAL LOCATION

Genetic locus: KIF4A (human) mapping to Xq13.1.

PRODUCT

KIF4A 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 KIF4A shRNA Plasmid (h): sc-60888-SH and KIF4A shRNA (h) Lentiviral Particles: sc-60888-V as alternate gene silencing products.

For independent verification of KIF4A (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-60888A, sc-60888B and sc-60888C.

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

KIF4A siRNA (h) is recommended for the inhibition of KIF4A 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.

RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor KIF4A gene expression knockdown using RT-PCR Primer: KIF4A (h)-PR: sc-60888-PR (20 µl, 525 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Matsumoto, Y., et al. 2018. Enhanced expression of KIF4A in colorectal cancer is associated with lymph node metastasis. Oncol. Lett. 15: 2188-2194.
2. Jagric, M., et al. 2021. Optogenetic control of PRC1 reveals its role in chromosome alignment on the spindle by overlap length-dependent forces. Elife 10: e61170.
3. Vukušic, K., et al. 2021. Microtubule-sliding modules based on kinesins EG5 and PRC1-dependent KIF4A drive human spindle elongation. Dev. Cell 56: 1253-1267.e10.
4. Risteski, P., et al. 2022. Length-dependent poleward flux of sister kinetochore fibers promotes chromosome alignment. Cell Rep. 40: 111169.
5. Neahring, L., et al. 2023. Torques within and outside the human spindle balance twist at anaphase. bioRxiv. E-published.
6. Risteski, P., et al. 2024. Microtubule poleward flux as a target for modifying chromosome segregation errors. Proc. Natl. Acad. Sci. USA 121: e2405015121.

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.