SANTA CRUZ BIOTECHNOLOGY, INC.

karyopherin β1 siRNA (h): sc-35736

BACKGROUND

Protein transport across the nucleus is a selective, multi-step process involving several cytoplasmic factors. Proteins must be recognized as import substrates, dock at the nuclear pore complex and translocate across the nuclear envelope in an ATP-dependent fashion. Two cytosolic factors centrally involved in the recognition and docking process are the karyopherin α1 and karyopherin β1 subunits. Karyopherin α1 functions in the recognition and targeting of substrates destined for nuclear import, while karyopherin β1 serves as an adapter, tethering the karyopherin α1/substrate complex to docking proteins on the nuclear envelope, termed nucleoporins. Karyopherin α2 has been shown to complex with Epstein-Barr virus nuclear antigen 1 (EBNA-1). Certain RNA-binding proteins are imported to the nucleus by karyopherin β2, and karyopherin β3 appears to be involved in the import of some ribosomal proteins.

REFERENCES

1. Moroianu, J., et al. 1995. Previously identified protein of uncertain function is karyopherin α and together with karyopherin β docks import substrate at nuclear pore complexes. Proc. Natl. Acad. Sci. USA 92: 2008-2011.
2. Moroianu, J., et al. 1995. Protein export from the nucleus requires the GTPase Ran and GTP hydrolysis. Proc. Natl. Acad. Sci. USA 92: 4318-4322.

CHROMOSOMAL LOCATION

Genetic locus: KPNB1 (human) mapping to 17q21.32.

PRODUCT

karyopherin β1 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 karyopherin β1 shRNA Plasmid (h): sc-35736-SH and karyopherin β1 shRNA (h) Lentiviral Particles: sc-35736-V as alternate gene silencing products.

For independent verification of karyopherin β1 (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-35736A, sc-35736B and sc-35736C.

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

karyopherin β1 siRNA (h) is recommended for the inhibition of karyopherin β1 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

karyopherin β1 (H-7): sc-137016 is recommended as a control antibody for monitoring of karyopherin β1 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 karyopherin β1 gene expression knockdown using RT-PCR Primer: karyopherin β1 (h)-PR: sc-35736-PR (20 µl, 494 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Nakahara, S., et al. 2006. Importin-mediated nuclear translocation of galectin-3. J. Biol. Chem. 281: 39649-39659.
2. Kojima, Y., et al. 2011. Importin β1 protein-mediated nuclear localization of death receptor 5 (DR5) limits DR5/tumor necrosis factor (TNF)-related apoptosis-inducing ligand (TRAIL)-induced cell death of human tumor cells. J. Biol. Chem. 286: 43383-43393.
3. Badding, M.A., et al. 2013. Proteomic and functional analyses of protein-DNA complexes during gene transfer. Mol. Ther. 21: 775-785.
4. Angus, L., et al. 2014. Inhibition of the nuclear transporter, Kpnβ1, results in prolonged mitotic arrest and activation of the intrinsic apoptotic pathway in cervical cancer cells. Carcinogenesis 35: 1121-1131.
5. van der Watt, P.J., et al. 2016. Targeting the nuclear import receptor Kpnβ1 as an anticancer therapeutic. Mol. Cancer Ther. 15: 560-573.
6. Duan, Z., et al. 2017. Characterization of the nuclear import pathway for BLM protein. Arch. Biochem. Biophys. 634: 57-68.
7. Zhang, M.Q., et al. 2020. A new transcription factor ATG10S activates IFNL2 transcription by binding at an IRF1 site in Hep G2 cells. Autophagy 16: 2167-2179.
8. Chi, R.A., et al. 2021. Inhibition of Kpnβ1 mediated nuclear import enhances cisplatin chemosensitivity in cervical cancer. BMC Cancer 21: 106.

RESEARCH USE

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