SANTA CRUZ BIOTECHNOLOGY, INC.

XRCC1 siRNA (h): sc-36859

BACKGROUND

The X-ray repair cross-complementing (XRCC) proteins are responsible for efficiently repairing and maintaining genetic stability following DNA base damage. These genes share sequence similarity with the yeast DNA repair protein Rad5. XRCC1 facilitates the DNA base excision repair pathway by interacting with DNA ligase III and DNA polymerase to repair DNA single-strand breaks. XRCC2 and XRCC3 are both involved in maintaining chromosome stability during cell division. XRCC2 is required for efficient repair of DNA double-strand breaks by homologous recombination between sister chromatids, and XRCC3 interacts directly with Rad51 to cooperate with Rad51 during recombinational repair. XRCC4 is an accessory factor of DNA ligase IV that preferentially binds DNA with nicks or broken ends. XRCC4 binds to DNA ligase IV and enhances its joining activity, and it is also involved in V(D)J recombination. Any defect in one of the known components of the DNA repair/V(D)J recombination machinery (Ku-70, Ku-80, DNA-PK_{CS}, XRCC4 and DNA ligase IV) leads to abortion of the V(D)J rearrangement process and early block in both T and B cell maturation.

CHROMOSOMAL LOCATION

Genetic locus: XRCC1 (human) mapping to 19q13.31.

PRODUCT

XRCC1 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 XRCC1 shRNA Plasmid (h): sc-36859-SH and XRCC1 shRNA (h) Lentiviral Particles: sc-36859-V as alternate gene silencing products.

For independent verification of XRCC1 (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-36859A, sc-36859B and sc-36859C.

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

XRCC1 siRNA (h) is recommended for the inhibition of XRCC1 expression in human cells.

PROTOCOLS

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

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

XRCC1 (AP-39): sc-517377 is recommended as a control antibody for monitoring of XRCC1 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 XRCC1 gene expression knockdown using RT-PCR Primer: XRCC1 (h)-PR: sc-36859-PR (20 µl, 437 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Petermann, E., et al. 2006. Roles of DNA ligase III and XRCC1 in regulating the switch between short patch and long patch BER. DNA Repair 5: 544-555.
2. Wang, S., et al. 2009. JWA regulates XRCC1 and functions as a novel base excision repair protein in oxidative-stress-induced DNA single-strand breaks. Nucleic Acids Res. 37: 1936-1950.
3. Tung, C.L., et al. 2015. Down-regulation of ERK1/2 and Akt-mediated X-ray repair cross-complement group 1 protein (XRCC1) expression by Hsp90 inhibition enhances the gefitinib-induced cytotoxicity in human lung cancer cells. Exp. Cell Res. 334: 126-135.
4. Tung, C.L., et al. 2016. Curcumin downregulates p38 MAPK-dependent X-ray repair cross-complement group 1 (XRCC1) expression to enhance cisplatin-induced cytotoxicity in human lung cancer cells. Naunyn Schmiedebergs Arch. Pharmacol. 389: 657-666.
5. Zhang, P., et al. 2017. Inhibition of B7-H3 reverses oxaliplatin resistance in human colorectal cancer cells. Biochem. Biophys. Res. Commun. 490: 1132-1138.
6. Im, J. and Nho, R.S. 2019. Fibroblasts from patients with idiopathic pulmonary fibrosis are resistant to cisplatin-induced cell death via enhanced CK2-dependent XRCC1 activity. Apoptosis 24: 499-510.

RESEARCH USE

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