SANTA CRUZ BIOTECHNOLOGY, INC.

XRCC1 (33-2-5): sc-56254

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 is a protein that 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; Xrcc1 (mouse) mapping to 7 A3.

SOURCE

XRCC1 (33-2-5) is a mouse monoclonal antibody raised against full length XRCC1 of human origin.

PRODUCT

Each vial contains 50 µg IgG_{2b} in 0.5 ml of PBS with < 0.1% sodium azide, 0.1% gelatin and < 0.1% stabilizer protein.

APPLICATIONS

XRCC1 (33-2-5) is recommended for detection of XRCC1 of mouse, rat and human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000), immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500), immunohistochemistry (including paraffin-embedded sections) (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

Suitable for use as control antibody for XRCC1 siRNA (h): sc-36859, XRCC1 siRNA (m): sc-36860, XRCC1 shRNA Plasmid (h): sc-36859-SH, XRCC1 shRNA Plasmid (m): sc-36860-SH, XRCC1 shRNA (h) Lentiviral Particles: sc-36859-V and XRCC1 shRNA (m) Lentiviral Particles: sc-36860-V.

Molecular Weight (predicted) of XRCC1: 69 kDa.

Molecular Weight (observed) of XRCC1: 71-92 kDa.

Positive Controls: Jurkat whole cell lysate: sc-2204, K-562 whole cell lysate: sc-2203 or NIH/3T3 whole cell lysate: sc-2210.

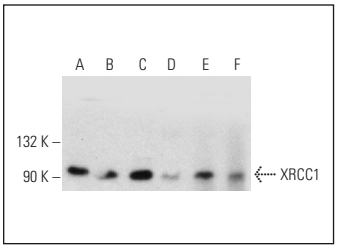
STORAGE

Store at 4° C, **DO NOT FREEZE**. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.

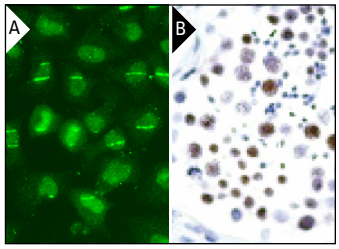
RESEARCH USE

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

DATA



XRCC1 (33-2-5): sc-56254. Western blot analysis of XRCC1 expression in MOLT-4 (**A**), K-562 (**B**), Jurkat (**C**) and NIH/3T3 (**D**) whole cell lysates and rat testis (**E**) and rat lung (**F**) tissue extracts.



XRCC1 (33-2-5): sc-56254. Immunofluorescence staining of formalin-fixed, UVA laser-microirradiated HeLa cells showing nuclear staining of cells with DNA damage. Kindly provided by Yang Xiang, Ph.D., Division of Newborn Medicine, Boston Childrens Hospital, Cell Biology Department, Harvard Medical School (**A**). Immunoperoxidase staining of formalin-fixed, paraffin-embedded human testis tissue showing nuclear localization (**B**).

SELECT PRODUCT CITATIONS

1. Pyndiah, S., et al. 2011. C-Myc suppresses BIN1 to release poly(ADP-ribose) polymerase 1: a mechanism by which cancer cells acquire cisplatin resistance. Sci. Signal. 4: ra19.
2. Grau, L., et al. 2013. A quantitative proteomic analysis uncovers the relevance of CUL3 in bladder cancer aggressiveness. PLoS ONE 8: e53328.
3. Yu, Z.C., et al. 2016. Requirement for human Mps1/TTK in oxidative DNA damage repair and cell survival through MDM2 phosphorylation. Nucleic Acids Res. 44: 1133-1150.
4. Singh, V., et al. 2019. XRCC1 deficiency correlates with increased DNA damage and male infertility. Mutat. Res. 839: 1-8.
5. Kliza, K.W., et al. 2021. Reading ADP-ribosylation signaling using chemical biology and interaction proteomics. Mol. Cell 81: 4552-4567.e8.
6. Zhang, Y., et al. 2021. Clinical impact of X-ray repair cross-complementary 1 (XRCC1) and the immune environment in colorectal adenoma-carcinoma pathway progression. J. Inflamm. Res. 14: 5403-5417.
7. Bradbury, A., et al. 2022. The role of ATR inhibitors in ovarian cancer: investigating predictive biomarkers of response. Cells 11: 2361.
8. Legartová, S., et al. 2022. Early recruitment of PARP-dependent m^6A RNA methylation at DNA lesions is subsequently accompanied by active DNA demethylation. RNA Biol. 19: 1153-1171.
9. Gonnella, R., et al. 2023. HSPs/STAT3 interplay sustains DDR and promotes cytokine release by primary effusion lymphoma cells. Int. J. Mol. Sci. 24: 3933.

PROTOCOLS

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