

Rif1 (B-3): sc-515573

BACKGROUND

Rif1 (Rap1-interacting factor 1) is the 2,472 amino acid homolog of the yeast Rap1 protein and is highly expressed in testis, with increased expression in late G₂/S phase of the cell cycle. Localized to midzone microtubules during anaphase and to condensed chromosomes during telophase, Rif1 is required for DNA-damage-induced, checkpoint-mediated cell cycle arrest during S phase. The yeast homolog of Rif1 functions by localizing to DNA-damaged foci and binding to uncapped telomeres, thereby inhibiting telomere elongation and slowing cell cycle progression. Human Rif1, unlike its yeast counterpart, does not participate in telomere maintenance or capping, but rather is thought to function at the microtubule midzone in a more global DNA damage response pathway. Rif1 may act by controlling transcription of telomere-related genes or by controlling resolution of twisted chromosomes by topoisomerase II (Topo II). Two isoforms of Rif1 exist due to alternative splicing events.

REFERENCES

1. Li, B. and de Lange, T. 2003. Rap1 affects the length and heterogeneity of human telomeres. *Mol. Biol. Cell* 14: 5060-5068.
2. Silverman, J., et al. 2004. Human Rif1, ortholog of a yeast telomeric protein, is regulated by Atm and 53BP1 and functions in the S-phase checkpoint. *Genes Dev.* 18: 2108-2119.
3. Banerjee, S. and Myung, K. 2004. Increased genome instability and telomere length in the Elg1-deficient *Saccharomyces cerevisiae* mutant are regulated by S-phase checkpoints. *Eukaryot. Cell* 3: 1557-1566.

CHROMOSOMAL LOCATION

Genetic locus: RIF1 (human) mapping to 2q23.3.

SOURCE

Rif1 (B-3) is a mouse monoclonal antibody specific for an epitope mapping between amino acids 24-45 at the N-terminus of Rif1 of human origin.

PRODUCT

Each vial contains 200 µg IgM kappa light chain in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

Blocking peptide available for competition studies, sc-515573 P, (100 µg peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% stabilizer protein).

APPLICATIONS

Rif1 (B-3) is recommended for detection of Rif1 of human origin by Western Blotting (starting dilution 1:100, 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) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

Suitable for use as control antibody for Rif1 siRNA (h): sc-62944, Rif1 shRNA Plasmid (h): sc-62944-SH and Rif1 shRNA (h) Lentiviral Particles: sc-62944-V.

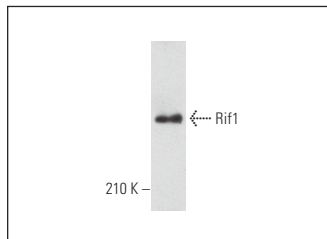
Molecular Weight of Rif1: 274 kDa.

Positive Controls: HeLa whole cell lysate: sc-2200.

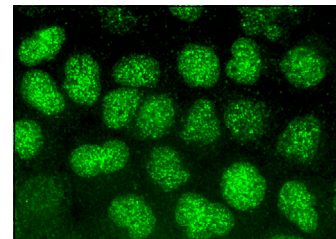
STORAGE

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

DATA



Rif1 (B-3): sc-515573. Western blot analysis of Rif1 expression in HeLa whole cell lysate.



Rif1 (B-3): sc-515573. Immunofluorescence staining of formalin-fixed A-431 cells showing nuclear localization.

SELECT PRODUCT CITATIONS

1. Li, L., et al. 2017. Role for Rif1-interacting partner DDX1 in BLM recruitment to DNA double-strand breaks. *DNA Rep.* 55: 47-63.
2. Liu, Y.B., et al. 2018. Downregulation of Rif1 enhances sensitivity to platinum-based chemotherapy in epithelial ovarian cancer (EOC) by regulating nucleotide excision repair (NER) pathway. *Cell. Physiol. Biochem.* 46: 1971-1984.
3. Francica, P., et al. 2020. Functional radiogenetic profiling implicates ERCC6L2 in non-homologous end joining. *Cell Rep.* 32: 108068.
4. Shorrock, A.K., et al. 2021. The Bloom syndrome complex senses RPA-coated single-stranded DNA to restart stalled replication forks. *Nat. Commun.* 12: 585.
5. Klomp, J.E., et al. 2021. CHK1 protects oncogenic KRAS-expressing cells from DNA damage and is a target for pancreatic cancer treatment. *Cell Rep.* 37: 110060.
6. Yu, E.Y., et al. 2021. Reciprocal impacts of telomerase activity and ADRN/MES differentiation state in neuroblastoma tumor biology. *Commun. Biol.* 4: 1315.
7. Yu, T., et al. 2022. SRSF1 governs progenitor-specific alternative splicing to maintain adult epithelial tissue homeostasis and renewal. *Dev. Cell* 57: 624-637.e4.
8. Setiawati, D., et al. 2022. Rif1 acts in DNA repair through phosphopeptide recognition of 53BP1. *Mol. Cell* 82: 1359-1371.e9.
9. Bleiler, M., et al. 2023. Incorporation of 53BP1 into phase-separated bodies in cancer cells during aberrant mitosis. *J. Cell Sci.* 136: jcs260027.
10. Kelliher, J.L., et al. 2024. Evolved histone tail regulates 53BP1 recruitment at damaged chromatin. *Nat. Commun.* 15: 4634.

RESEARCH USE

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