SANTA CRUZ BIOTECHNOLOGY, INC.

Rad54 (4E3/1): sc-53433

BACKGROUND

Rad52 family members (Rad50, Rad51B/C/D, Rad52, Rad54, MRE11) mediate DNA double-strand break repair (DSBR) for DNA damage that otherwise could cause cell death, mutation or neoplastic transformation. Rad51 (RECA, BRCC5) interacts with BRCA1 and BRCA2 to influence subcellular localization and cellular response to DNA damage. BRCA2 inactivation may be a key event leading to genomic instability and tumorigenesis from deregulation of Rad51. Rad52 forms a heptameric ring that binds single-stranded DNA ends and catalyzes DNA-DNA interaction necessary for the annealing of complementary strands. Rad52 can interact with Rad51. Rad54A of the DEAD-like helicase superfamily binds to double-strand DNA and induces a DNA topological change, which is thought to facilitate homologous DNA pairing and stimulate DNA recombination. Rad54B of the DEAD-like helicase superfamily binds to double-stranded DNA and displays ATPase activity in the presence of DNA. Rad54B is abundant in testis and spleen, and mutations of this gene occur in primary lymphoma and colon cancer. MRE11 (meiotic recombination 11, ATLD, HNGS1) is a nuclear 3'-5' exonuclease/endonuclease that associates with Rad50 and influences homologous recombination, telomere length maintenance, and DNA double-strand break repair. MRE11 is most abundant in proliferating tissues.

REFERENCES

1. Tsukamoto, Y., et al. 1996. Effects of mutations of Rad50, Rad51, Rad52 and related genes on illegitimate recombination in *Saccharomyces cerevisiae*. Genetics 142: 383-391.
2. Zhong, Q., et al. 2002. Deficient nonhomologous end-joining activity in cell-free extracts from BRCA1-null fibroblasts. Cancer Res. 62: 3966-3970.
3. Lisby, M., et al. 2003. Co-localization of multiple DNA double-strand breaks at a single Rad52 repair centre. Nat. Cell Biol. 5: 572-577.
4. Sugawara, N., et al. 2003. *In vivo* roles of Rad52, Rad54, and Rad55 proteins in Rad51-mediated recombination. Mol. Cell 12: 209-219.
5. Miyazaki, T., et al. 2004. *In vivo* assembly and disassembly of Rad51 and Rad52 complexes during double-strand break repair. EMBO J. 23: 939-949.
6. O'Connor, M.S., et al. 2004. The human Rap1 protein complex and modulation of telomere length. J. Biol. Chem. 279: 28585-28591.
7. Bekker-Jensen, S., et al. 2006. Spatial organization of the mammalian genome surveillance machinery in response to DNA strand breaks. J. Cell Biol. 173: 195-206.

CHROMOSOMAL LOCATION

Genetic locus: RAD54L (human) mapping to 1p34.1.

SOURCE

Rad54 (4E3/1) is a mouse monoclonal antibody raised against full length Rad54 of human origin.

PRODUCT

Each vial contains 200 µg IgG_1 kappa light chain in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

APPLICATIONS

Rad54 (4E3/1) is recommended for detection of Rad54 of 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)] and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

Rad54 (4E3/1) is also recommended for detection of Rad54 in additional species, including canine, ovine, rabbit, Guinea pig and monkey.

Suitable for use as control antibody for Rad54 siRNA (h): sc-36362, Rad54 shRNA Plasmid (h): sc-36362-SH and Rad54 shRNA (h) Lentiviral Particles: sc-36362-V.

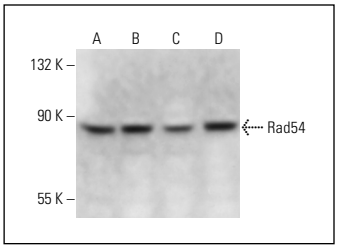
Molecular Weight of Rad54: 85 kDa.

Positive Controls: K-562 nuclear extract: sc-2130, Jurkat nuclear extract: sc-2132 or Ramos nuclear extract: sc-2153.

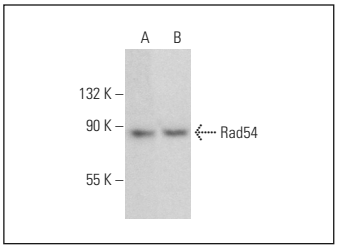
RECOMMENDED SUPPORT REAGENTS

To ensure optimal results, the following support reagents are recommended: 1) Western Blotting: use m-IgGκ BP-HRP: sc-516102 or m-IgGκ BP-HRP (Cruz Marker): sc-516102-CM (dilution range: 1:1000-1:10000), Cruz Marker™ Molecular Weight Standards: sc-2035, UltraCruz® Blocking Reagent: sc-516214 and Western Blotting Luminol Reagent: sc-2048. 2) Immunoprecipitation: use Protein A/G PLUS-Agarose: sc-2003 (0.5 ml agarose/2.0 ml).

DATA



Rad54 (4E3/1): sc-53433. Western blot analysis of Rad54 expression in K-562 (**A**), Jurkat (**B**), HeLa (**C**) and Ramos (**D**) nuclear extracts.



Rad54 (4E3/1): sc-53433. Western blot analysis of Rad54 expression in K-562 whole cell lysate (**A**) and MOLT-4 nuclear extract (**B**).

SELECT PRODUCT CITATIONS

1. Gothe, H.J., et al. 2019. Spatial chromosome folding and active transcription drive DNA fragility and formation of oncogenic MLL translocations. Mol. Cell 75: 267-283.

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.