SANTA CRUZ BIOTECHNOLOGY, INC.

MRE11 (J8-12): sc-101233

BACKGROUND

DNA double-strand breaks are generated by ionizing radiation and endogenously produced radicals, and they often are repaired through the Rad52 homologous recombination pathway. The Rad52 family includes Rad51, Rad52, Rad54, Rad54B and MRE11 genes. Rad51 and Rad52 proteins perform the key steps in homologous recombination (HR), including the search for DNA homology and strand exchange, through similar mechanisms. MRE11 functions in both non-homologous end joining and meiotic HR, and it is essential in mitosis for chromosome maintenance. Rad54 belongs to the SWI2/Snf2 subfamily of ATPases, which includes the DNA helicases involved in replication, recombination and repair, as it contains seven amino acid sequence motifs that are largely conserved. Rad54 ATPase activity is dependent on double-stranded (ds) DNA, and the ATPase activity of Rad54 is not absolutely required for its DNA repair function, suggesting that these activities occur at distinct regions of the molecule. Rad54B is significantly homologous to the Rad54 recombination gene. Expression of Rad54B is highest in testis and spleen, which are active in both meiotic and mitotic recombination.

REFERENCES

1. Park, M.S. 1995. Expression of human Rad52 confers resistance to ionizing radiation in mammalian cells. J. Biol. Chem. 270: 15467-15470.
2. Shen, Z., et al. 1996. Specific interactions between the human Rad51 and Rad52 proteins. J. Biol. Chem. 271: 148-152.
3. Benson, F.E., et al. 1998. Synergistic actions of Rad51 and Rad52 in recombination and DNA repair. Nature 391: 401-404.
4. Swagemakers, S.M., et al. 1998. The human Rad54 recombinational DNA repair protein is a double-stranded DNA-dependent ATPase. J. Biol. Chem. 273: 28292-28297.
5. Goedecke, W., et al. 1999. MRE11 and Ku70 interact in somatic cells, but are differentially expressed in early meiosis. Nat. Genet. 23: 194-198.
6. Yamaguchi-Iwai, Y., et al. 1999. MRE11 is essential for the maintenance of chromosomal DNA in vertebrate cells. EMBO J. 18: 6619-6629.
7. Hiramoto, T., et al. 1999. Mutations of a novel human Rad54 homologue, Rad54B, in primary cancer. Oncogene 18: 3422-3426.
8. Matsuda, M., et al. 1999. Mutations in the Rad54 recombination gene in primary cancers. Oncogene 18: 3427-3430.

CHROMOSOMAL LOCATION

Genetic locus: MRE11A (human) mapping to 11q21.

STORAGE

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

PROTOCOLS

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

SOURCE

MRE11 (J8-12) is a mouse monoclonal antibody raised against recombinant MRE11 of human origin.

PRODUCT

Each vial contains 100 µg IgG_{2a} in 1.0 ml PBS with < 0.1% sodium azide and 0.1% gelatin.

APPLICATIONS

MRE11 (J8-12) is recommended for detection of MRE11 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).

Suitable for use as control antibody for MRE11 siRNA (h): sc-37395, MRE11 shRNA Plasmid (h): sc-37395-SH and MRE11 shRNA (h) Lentiviral Particles: sc-37395-V.

Molecular Weight of MRE11: 80 kDa.

Positive Controls: K-562 whole cell lysate: sc-2203, HeLa whole cell lysate: sc-2200 or Jurkat whole cell lysate: sc-2204.

RECOMMENDED SECONDARY REAGENTS

To ensure optimal results, the following support (secondary) reagents are recommended: 1) Western Blotting: use goat anti-mouse IgG-HRP: sc-2005 (dilution range: 1:2000-1:32,000) or Cruz Marker™ compatible goat anti-mouse IgG-HRP: sc-2031 (dilution range: 1:2000-1:5000), Cruz Marker™ Molecular Weight Standards: sc-2035, TBS Blotto A Blocking Reagent: sc-2333 and Western Blotting Luminol Reagent: sc-2048. 2) Immunoprecipitation: use Protein A/G PLUS-Agarose: sc-2003 (0.5 ml agarose/2.0 ml).

SELECT PRODUCT CITATIONS

1. Cook, P.J., et al. 2009. Tyrosine dephosphorylation of H2AX modulates apoptosis and survival decisions. Nature 458: 591-596.

RESEARCH USE

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