

MLH1 (B-12): sc-271978

BACKGROUND

DNA-mismatch repair (MMR) is an essential process in maintaining genetic stability. Lack of a functional DNA-mismatch repair pathway is a common characteristic of several different types of human cancers, either due to an MMR gene mutation or promoter methylation gene silencing. MLH1 is an integral part of the protein complex responsible for mismatch repair that is expressed in lymphocytes, heart, colon, breast, lung, spleen, testis, prostate, thyroid and gall bladder and is methylated in several ovarian tumors. Loss of MLH1 protein expression is associated with a mutated phenotype, micro-satellite instability and a predisposition to cancer. In hereditary nonpolyposis colorectal cancer (HNPCC), an autosomal dominant inherited cancer syndrome that signifies a high risk of colorectal and various other types of cancer, the MLH1 gene exhibits a pathogenic mutation. Certain cancer cell lines, including leukemia CCRF-CEM, colon HCT 116 and KM12, and ovarian cancers SK-OV-3 and IGROV-1, show complete deficiency of MLH1, while MLH1 is expressed in 60% of melanomas, 70% of noninvasive squamous cell carcinomas and 30% of invasive squamous cell carcinomas.

REFERENCES

1. Jarvinen, H.J., et al. 2000. Surveillance on mutation carriers of DNA mismatch repair genes. *Ann. Chir. Gynaecol.* 89: 207-210.
2. Korabiowska, M., et al. 2000. Analysis of the DNA mismatch repair proteins expression in malignant melanomas. *Anticancer Res.* 20: 4499-4505.

CHROMOSOMAL LOCATION

Genetic locus: MLH1 (human) mapping to 3p22.2; Mlh1 (mouse) mapping to 9 F3.

SOURCE

MLH1 (B-12) is a mouse monoclonal antibody specific for an epitope mapping between amino acids 706-756 at the C-terminus of MLH1 of human origin.

PRODUCT

Each vial contains 200 µg IgG₁ kappa light chain in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

MLH1 (B-12) is available conjugated to agarose (sc-271978 AC), 500 µg/0.25 ml agarose in 1 ml, for IP; to HRP (sc-271978 HRP), 200 µg/ml, for WB, IHC(P) and ELISA; to either phycoerythrin (sc-271978 PE), fluorescein (sc-271978 FITC), Alexa Fluor® 488 (sc-271978 AF488), Alexa Fluor® 546 (sc-271978 AF546), Alexa Fluor® 594 (sc-271978 AF594) or Alexa Fluor® 647 (sc-271978 AF647), 200 µg/ml, for WB (RGB), IF, IHC(P) and FCM; and to either Alexa Fluor® 680 (sc-271978 AF680) or Alexa Fluor® 790 (sc-271978 AF790), 200 µg/ml, for Near-Infrared (NIR) WB, IF and FCM.

Blocking peptide available for competition studies, sc-271978 P, (100 µg peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% stabilizer protein).

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RESEARCH USE

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

APPLICATIONS

MLH1 (B-12) is recommended for detection of MLH1 of mouse, rat and 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).

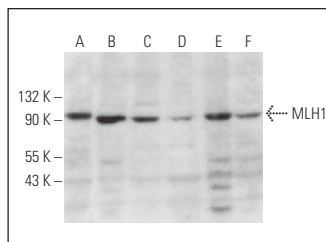
MLH1 (B-12) is also recommended for detection of MLH1 in additional species, including canine, bovine, porcine and avian.

Suitable for use as control antibody for MLH1 siRNA (h): sc-35943, MLH1 siRNA (m): sc-35944, MLH1 shRNA Plasmid (h): sc-35943-SH, MLH1 shRNA Plasmid (m): sc-35944-SH, MLH1 shRNA (h) Lentiviral Particles: sc-35943-V and MLH1 shRNA (m) Lentiviral Particles: sc-35944-V.

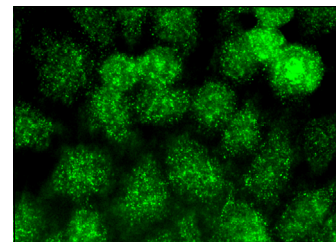
Molecular Weight of MLH1: 85 kDa.

Positive Controls: KNRK nuclear extract: sc-2141, SW480 cell lysate: sc-2219 or NTERA-2 cl.D1 whole cell lysate: sc-364181.

DATA



MLH1 (B-12): sc-271978. Western blot analysis of MLH1 expression in KNRK nuclear extract (A) and SW480 (B), MDA-MB-231 (C), WI-38 (D), NTERA-2 cl.D1 (E) and TT (F) whole cell lysates.



MLH1 (B-12): sc-271978. Immunofluorescence staining of methanol-fixed HeLa cells showing nuclear localization.

SELECT PRODUCT CITATIONS

1. Zhang, M., et al. 2019. HDAC6 regulates DNA damage response via deacetylating MLH1. *J. Biol. Chem.* 294: 5813-5826.
2. Liu, Q., et al. 2020. Yeast mismatch repair components are required for stable inheritance of gene silencing. *PLoS Genet.* 16: e1008798.
3. Wu, M.T., et al. 2021. MTHFR knockdown assists cell defense against folate depletion induced chromosome segregation and uracil misincorporation in DNA. *Int. J. Mol. Sci.* 22: 9392.
4. Kadyrova, L.Y., et al. 2022. The nuclease activity of DNA2 promotes exonuclease 1-independent mismatch repair. *J. Biol. Chem.* 298: 101831.
5. Zhu, J., et al. 2022. Sirt3 deficiency accelerates ovarian senescence without affecting spermatogenesis in aging mice. *Free Radic. Biol. Med.* 193: 511-525.

STORAGE

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