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MLH1 Antibody

Purified Mouse Monoclonal Antibody
Catalog # AO1200a

Product Information

Application	WB, IHC, ICC, E
Primary Accession	P40692
Reactivity	Human, Monkey
Host	Mouse
Clonality	Monoclonal
Clone Names	4C9C7
Isotype	IgG1
Calculated MW	84601
Description	DNA-mismatch repair (MMR), a conserved process that involves correcting errors made during DNA synthesis, is crucial to the maintenance of genomic integrity. Lack of a functional DNA-mismatch repair pathway is a commoncharacteristic of several different types of human cancers, either due to anMMR gene mutation or promoter-methylation gene silencing. MLH1 is a human homolog of the E. coli DNA mismatch repair gene mutL, consistent with the characteristic alterations in microsatellite sequences (RER+ phenotype) found in hereditary nonpolyposis colon cancer (HNPCC). MLH1 is an integralpart of the protein complex responsible for mismatch repair expressed inlymphocytes, heart, colon, breast, lung, spleen, testis, prostate, thyroid andgall bladder, and is methylated in several ovarian tumors. Loss of MLH1 protein expression is associated with a mutated phenotype, microsatellite instability and a predisposition to cancer. In hereditary nonpolyposis colorectalcancer (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. Inactivation of the MLH1 gene causes genome instability and predisposition to cancer. MLH1 also plays a role in meiotic recombination.
Immunogen	Purified recombinant fragment of MLH1 (aa381-483) expressed in E. Coli.
Formulation	Ascitic fluid containing 0.03% sodium azide.

Additional Information

Gene ID	4292
Other Names	DNA mismatch repair protein Mlh1, MutL protein homolog 1, MLH1, COCA2
Dilution	WB~~1/500 - 1/2000 IHC~~1/200 - 1/1000 ICC~~N/A E~~N/A
Storage	Maintain refrigerated at 2-8°C for up to 6 months. For long term storage store at -20°C in small aliquots to prevent freeze-thaw cycles.

Precautions	MLH1 Antibody is for research use only and not for use in diagnostic or therapeutic procedures.

Protein Information

Name	MLH1
Synonyms	COCA2
Function	Heterodimerizes with PMS2 to form MutL alpha, a component of the post-replicative DNA mismatch repair system (MMR). DNA repair is initiated by MutS alpha (MSH2-MSH6) or MutS beta (MSH2-MSH3) binding to a dsDNA mismatch, then MutL alpha is recruited to the heteroduplex. Assembly of the MutL-MutS-heteroduplex ternary complex in presence of RFC and PCNA is sufficient to activate endonuclease activity of PMS2. It introduces single-strand breaks near the mismatch and thus generates new entry points for the exonuclease EXO1 to degrade the strand containing the mismatch. DNA methylation would prevent cleavage and therefore assure that only the newly mutated DNA strand is going to be corrected. MutL alpha (MLH1-PMS2) interacts physically with the clamp loader subunits of DNA polymerase III, suggesting that it may play a role to recruit the DNA polymerase III to the site of the MMR. Also implicated in DNA damage signaling, a process which induces cell cycle arrest and can lead to apoptosis in case of major DNA damages. Heterodimerizes with MLH3 to form MutL gamma which plays a role in meiosis.
Cellular Location	Nucleus. Chromosome. Note=Recruited to chromatin in a MCM9- dependent manner.
Tissue Location	Colon, lymphocytes, breast, lung, spleen, testis, prostate, thyroid, gall bladder and heart

References

1. Int J Cancer. 2007 Aug 1;121(3):555-8. 2. Autophagy. 2007 Jul-Aug;3(4):368-70. 3. Fam Cancer. 2008 Jun;7(2):163-172.

Images

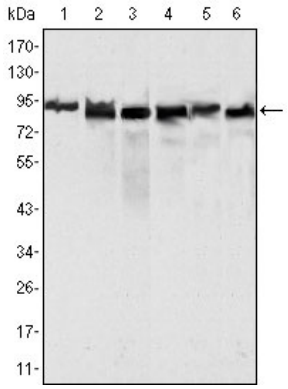
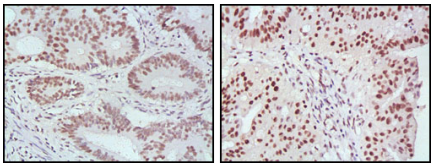


Figure 1: Western blot analysis using MLH1 mouse mAb against Hela (1), MCF-7 (2) and A549 (3), Jurkat (4), 2R75 (5) and COS (6) cell lysate.

Figure 2: Immunohistochemical analysis of paraffin-embedded human rectum cancer (left) and ovarian cancer (right) tissues, showing nuclear



localization with DAB staining using MLH1 mouse mAb.

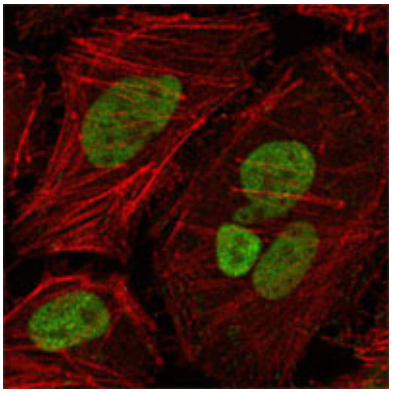


Figure 3: Confocal immunofluorescence analysis of Hela cells using MLH1 mouse mAb (green), showing nuclear localization. Red: Actin filaments have been labeled with Alexa Fluor-555 phalloidin.