abcam

Product datasheet

# Anti-MSH2 antibody ab70270

4 Abreviews 18 References 5 Images

## Overview

| | |
|---|---|
| **Product name** | Anti-MSH2 antibody |
| **Description** | Rabbit polyclonal to MSH2 |
| **Host species** | Rabbit |
| **Tested applications** | **Suitable for:** WB, IP, ICC/IF, IHC-P |
| **Species reactivity** | **Reacts with:** Mouse, Human<br>**Predicted to work with:** Guinea pig, Cow, Pig, Rhesus monkey, Gorilla, African green monkey, Common marmoset, Orangutan, Elephant |
| **Immunogen** | Synthetic peptide within Human MSH2 aa 850-950 (C terminal). The exact immunogen sequence used to generate this antibody is proprietary information. If additional detail on the immunogen is needed to determine the suitability of the antibody for your needs, please **contact** our Scientific Support team to discuss your requirements.<br>Database link: **P43246** |
| **Positive control** | WB: HeLa, Ramos and NIH/3T3 whole cell lysate. IHC-P: Human metastatic lymph node and mouse squamous cell carcinoma tissue. IP: HeLa whole cell lysate. ICC/IF: HeLa and HepG2 cells. |
| **General notes** | To see more of the key markers and tools you need to study the hallmarks of cancer, including genome instability and mutation, please visit the following **page**.<br><br>The Life Science industry has been in the grips of a reproducibility crisis for a number of years. Abcam is leading the way in addressing this with our range of recombinant monoclonal antibodies and knockout edited cell lines for gold-standard validation. Please check that this product meets your needs before purchasing.<br><br>If you have any questions, special requirements or concerns, please send us an inquiry and/or contact our Support team ahead of purchase. Recommended alternatives for this product can be found below, along with publications, customer reviews and Q&As |

## Properties

| | |
|---|---|
| **Form** | Liquid |
| **Storage instructions** | Shipped at 4°C. Upon delivery aliquot and store at -20°C. Avoid freeze / thaw cycles. |
| **Storage buffer** | pH: 7<br>Preservative: 0.09% Sodium azide |

| | |
|---|---|
| | Constituents: 1.815% Tris, 1.764% Sodium citrate, 0.021% PBS |
| **Purity** | Immunogen affinity purified |
| **Clonality** | Polyclonal |
| **Isotype** | IgG |

## Applications

**The Abpromise guarantee** Our **Abpromise guarantee** covers the use of ab70270 in the following tested applications.

The application notes include recommended starting dilutions; optimal dilutions/concentrations should be determined by the end user.

| Application | Abreviews | Notes |
|---|---|---|
| **WB** | ★★★★☆ (3) | 1/5000 - 1/15000. Detects a band of approximately 116 kDa (predicted molecular weight: 105 kDa). |
| **IP** | | Use at 2-5 µg/mg of lysate. |
| **ICC/IF** | ★★★★★ (1) | Use a concentration of 1 µg/ml. |
| **IHC-P** | | 1/1000 - 1/5000. Perform heat mediated antigen retrieval with citrate buffer pH 6 before commencing with IHC staining protocol. |

## Target

**Function** Component of the post-replicative DNA mismatch repair system (MMR). Forms two different heterodimers: MutS alpha (MSH2-MSH6 heterodimer) and MutS beta (MSH2-MSH3 heterodimer) which binds to DNA mismatches thereby initiating DNA repair. When bound, heterodimers bend the DNA helix and shields approximately 20 base pairs. MutS alpha recognizes single base mismatches and dinucleotide insertion-deletion loops (IDL) in the DNA. MutS beta recognizes larger insertion-deletion loops up to 13 nucleotides long. After mismatch binding, MutS alpha or beta forms a ternary complex with the MutL alpha heterodimer, which is thought to be responsible for directing the downstream MMR events, including strand discrimination, excision, and resynthesis. ATP binding and hydrolysis play a pivotal role in mismatch repair functions. The ATPase activity associated with MutS alpha regulates binding similar to a molecular switch: mismatched DNA provokes ADP-->ATP exchange, resulting in a discernible conformational transition that converts MutS alpha into a sliding clamp capable of hydrolysis-independent diffusion along the DNA backbone. This transition is crucial for mismatch repair. MutS alpha may also play a role in DNA homologous recombination repair. In melanocytes may modulate both UV-B-induced cell cycle regulation and apoptosis.

**Tissue specificity** Ubiquitously expressed.

**Involvement in disease** Defects in MSH2 are the cause of hereditary non-polyposis colorectal cancer type 1 (HNPCC1) [MIM:120435]. Mutations in more than one gene locus can be involved alone or in combination in the production of the HNPCC phenotype (also called Lynch syndrome). Most families with clinically recognized HNPCC have mutations in either MLH1 or MSH2 genes. HNPCC is an autosomal, dominantly inherited disease associated with marked increase in cancer susceptibility. It is characterized by a familial predisposition to early onset colorectal carcinoma (CRC) and extra-colonic cancers of the gastrointestinal, urological and female reproductive tracts. HNPCC is reported to be the most common form of inherited colorectal cancer in the Western

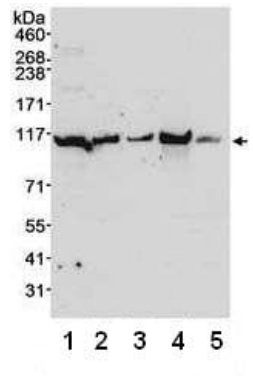
world. Cancers in HNPCC originate within benign neoplastic polyps termed adenomas. Clinically, HNPCC is often divided into two subgroups. Type I: hereditary predisposition to colorectal cancer, a young age of onset, and carcinoma observed in the proximal colon. Type II: patients have an increased risk for cancers in certain tissues such as the uterus, ovary, breast, stomach, small intestine, skin, and larynx in addition to the colon. Diagnosis of classical HNPCC is based on the Amsterdam criteria: 3 or more relatives affected by colorectal cancer, one a first degree relative of the other two; 2 or more generation affected; 1 or more colorectal cancers presenting before 50 years of age; exclusion of hereditary polyposis syndromes. The term "suspected HNPCC" or "incomplete HNPCC" can be used to describe families who do not or only partially fulfill the Amsterdam criteria, but in whom a genetic basis for colon cancer is strongly suspected. MSH2 mutations may predispose to hematological malignancies and multiple cafe-au-lait spots. Defects in MSH2 are a cause of Muir-Torre syndrome (MuToS) [MIM:158320]; also abbreviated MTS. MuToS is a rare autosomal dominant disorder characterized by sebaceous neoplasms and visceral malignancy.
Defects in MSH2 are a cause of susceptibility to endometrial cancer (ENDMC) [MIM:608089].
Defects in MSH2 are a cause of hereditary non-polyposis colorectal cancer type 8 (HNPCC8) [MIM:613244]. HNPCC is a disease associated with marked increase in cancer susceptibility. It is characterized by a familial predisposition to early-onset colorectal carcinoma (CRC) and extra-colonic tumors of the gastrointestinal, urological and female reproductive tracts. HNPCC is reported to be the most common form of inherited colorectal cancer in the Western world. Clinically, HNPCC is often divided into two subgroups. Type I is characterized by hereditary predisposition to colorectal cancer, a young age of onset, and carcinoma observed in the proximal colon. Type II is characterized by increased risk for cancers in certain tissues such as the uterus, ovary, breast, stomach, small intestine, skin, and larynx in addition to the colon. Diagnosis of classical HNPCC is based on the Amsterdam criteria: 3 or more relatives affected by colorectal cancer, one a first degree relative of the other two; 2 or more generation affected; 1 or more colorectal cancers presenting before 50 years of age; exclusion of hereditary polyposis syndromes. The term 'suspected HNPCC' or 'incomplete HNPCC' can be used to describe families who do not or only partially fulfill the Amsterdam criteria, but in whom a genetic basis for colon cancer is strongly suspected. Note=HNPCC8 results from heterozygous deletion of 3-prime exons of EPCAM and intergenic regions directly upstream of MSH2, resulting in transcriptional read-through and epigenetic silencing of MSH2 in tissues expressing EPCAM.

**Sequence similarities** Belongs to the DNA mismatch repair mutS family.

**Post-translational modifications** Phosphorylated by PRKCZ, which may prevent MutS alpha degradation by the ubiquitin-proteasome pathway.
Phosphorylated upon DNA damage, probably by ATM or ATR.

**Cellular localization** Nucleus.

## Images




Western blot - Anti-MSH2 antibody (ab70270)

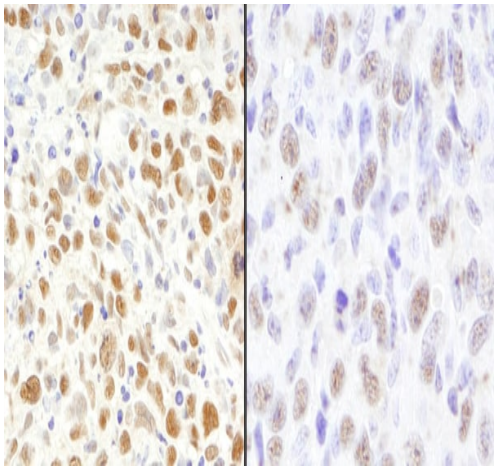
**All lanes :** Anti-MSH2 antibody (ab70270) at 0.1 µg/ml

**Lane 1 :** HeLa whole cell lysate at 50 µg
**Lane 2 :** HeLa whole cell lysate at 15 µg
**Lane 3 :** HeLa whole cell lysate at 5 µg
**Lane 4 :** Ramos whole cell lysate at 50 µg
**Lane 5 :** NIH3T3 whole cell lysate at 50 µg

Developed using the ECL technique.

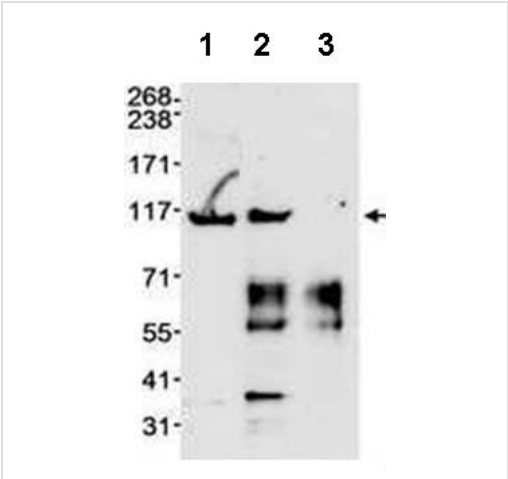
**Predicted band size:** 105 kDa
**Observed band size:** 116 kDa

**Exposure time:** 3 minutes



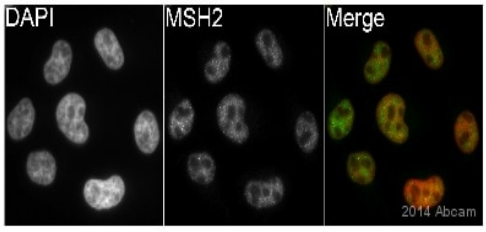
Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-MSH2 antibody (ab70270)

Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) analysis of human metastatic lymph node (left) and mouse squamous cell carcinoma (right) tissues labelling MSH2 with ab70270 at 1/1000 (1µg/ml) and 1/5000 (0.2µg/ml). Detection: DAB.




Immunoprecipitation - Anti-MSH2 antibody (ab70270)

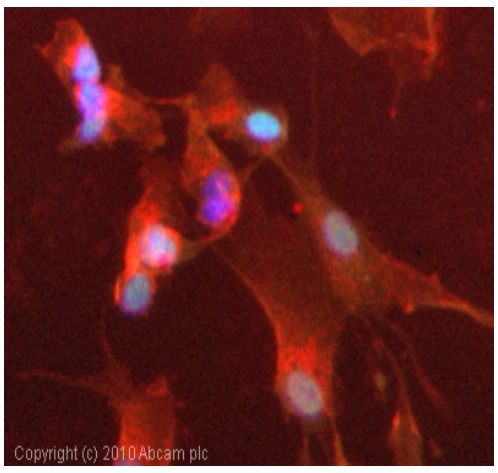
Immunoprecipitation of HeLa whole cell lysate. Lane 1: 50µg of input lysate. Lane 2: HeLa whole cell lysate (1mg) immunoprecipitated with ab70270 at 3µg/mg. Lane 3: HeLa whole cell lysate immunoprecipitated with control IgG. Samples were subjected to Western blot, analysed with ab70270 at 0.1µg/ml and detected by chemiluminescence with an exposure time of 3 minutes.




Immunocytochemistry/ Immunofluorescence - Anti-MSH2 antibody (ab70270)

This image is courtesy of an Abreview submitted by Kirk McManus

ab70270 staining MSH2 in HeLa cells by ICC/IF (Immunocytochemistry/immunofluorescence). Cells were fixed with paraformaldehyde and permeabilized with 0.5% Triton X-100 in PBS. Samples were incubated with primary antibody (1/500 in PBS) for 1 hour at 22°C. **ab150081**, an Alexa Fluor® 488-conjugated goat anti-rabbit IgG polyclonal (1/200) was used as the secondary antibody. Counterstained with DAPI.




Immunocytochemistry/ Immunofluorescence - Anti-MSH2 antibody (ab70270)

ICC/IF image of ab70270 stained HepG2 cells. The cells were 4% PFA fixed (10 min) and then incubated in 1%BSA / 10% normal goat serum / 0.3M glycine in 0.1% PBS-Tween for 1h to permeabilise the cells and block non-specific protein-protein interactions. The cells were then incubated with the antibody (ab70270, 1µg/ml) overnight at +4°C. The secondary antibody (green) was Alexa Fluor® 488 goat anti-rabbit IgG (H+L) used at a 1/1000 dilution for 1h. Alexa Fluor® 594 WGA was used to label plasma membranes (red) at a 1/200 dilution for 1h. DAPI was used to stain the cell nuclei (blue) at a concentration of 1.43µM.

**Please note:** All products are "FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC PROCEDURES"

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