abcam

ab212188

Anti-MSH2 antibody [EPR21017-2]

Recombinant | RabMAb | KO Validated

Key facts

Isotype	IgG1
Host species	Rabbit
Storage buffer	pH: 7.2 - 7.4 Preservative: 0.01% Sodium azide Constituents: PBS, 40% Glycerol (glycerin, glycerine), 0.05% BSA
Form	Liquid
Clonality	Monoclonal
Immunogen	The exact immunogen used to generate this antibody is proprietary information.
Clone number	EPR21017-2
Purification technique	Affinity purification Protein A
Concentration	0.573 mg/mL The concentration of this product may be batch-dependent Batch concentration finder →

Reactivity data

WB

Tested

Species	Mouse
Dilution info	1/1000
Notes	-

Species	Rat

Dilution info	1/1000
Notes	-

Species	Human
Dilution info	1/1000
Notes	-

ICC/IF

Tested

Species	Human
Dilution info	1/100
Notes	Human only.

Expected

Species	Mouse, Rat
Dilution info	Use at an assay dependent concentration.
Notes	-

Flow Cyt (Intra)

Tested

Species	Human
Dilution info	1/600 - 1/6000
Notes	Human only.

Expected

Species	Mouse, Rat
Dilution info	Use at an assay dependent concentration.
Notes	-

IHC-P

Tested

Species	Mouse
Dilution info	1/10000
Notes	Perform heat-mediated antigen retrieval with Tris/EDTA buffer pH 9.0 before commencing with IHC staining protocol.

Species	Rat
Dilution info	1/10000
Notes	Perform heat-mediated antigen retrieval with Tris/EDTA buffer pH 9.0 before commencing with IHC staining protocol.

Species	Human
Dilution info	1/10000
Notes	Perform heat-mediated antigen retrieval with Tris/EDTA buffer pH 9.0 before commencing with IHC staining protocol.

Target data

See full target information MSH2

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. Recruits DNA helicase MCM9 to chromatin which unwinds the mismatch containing DNA strand (PubMed:26300262). 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.

Storage

Shipped at conditions	Conditional Ambient
Appropriate short-term storage duration	1-2 weeks
Appropriate short-term storage conditions	+4°C
Appropriate long-term storage conditions	-20°C
Aliquoting information	Upon delivery aliquot
Storage information	Avoid freeze / thaw cycle

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.

Patented technology
Our RabMAb® technology is a patented hybridoma-based technology for making rabbit monoclonal antibodies. For details on our patents, please refer to RabMAb® patents.

What are the advantages of a recombinant monoclonal antibody?
This product is a recombinant monoclonal antibody, which offers several advantages including:

- High batch-to-batch consistency and reproducibility
- Improved sensitivity and specificity
- Long-term security of supply
- Animal-free batch production

For more information, read more on recombinant antibodies.

Supplementary info

This supplementary information is collated from multiple sources and compiled automatically.

Activity summary	MSH2 also known as MutS Homolog 2 is a human protein with a molecular weight of approximately 100 kDa. It is an important component of the DNA mismatch repair system and plays an essential role in maintaining genomic stability by recognizing and repairing mismatched nucleotides during DNA replication. Expression of the MSH2 protein occurs broadly in dividing cells across various tissues with notable presence in tissues with high proliferation rates such as the colon and the endometrium. Additionally detection and quantification of MSH2 are often performed using methodologies such as MSH2 ELISA which aids in the assessment of its expression levels in different biological samples.

Biological function summary	Components are identified in mismatch repair where MSH2 forms a heterodimer with MSH6 known as the MutSα complex or with MSH3 known as the MutSβ complex. This heterodimerization is critical for the initial steps in the recognition and binding of mismatch errors on the DNA strand. MSH2 complex formation enables it to scan the DNA for errors facilitating the recruitment of additional repair proteins. The activity of MSH2 in these complexes is important in preserving the fidelity of genetic information and prevents mutations that could lead to genomic instability.
Pathways	MSH2 operates within the DNA damage response and repair pathways. The protein is a core component of the mismatch repair pathway which corrects DNA replication errors that elude proofreading activity of DNA polymerases. It interacts with other proteins such as MLH1 and PMS2 forming a synergistic function that amplifies the capacity to recognize and initiate repair of mismatches. The pathway involving MSH2 not only repairs mismatched bases but also plays a role in cell cycle control checkpoints and apoptosis evidencing its pivotal role in maintaining cell cycle integrity.
Associated diseases and disorders	Studies show that MSH2 is strongly associated with Lynch syndrome an autosomal dominant inherited condition that increases the risk of colorectal cancer. Mutations in the MSH2 gene impair its mismatch repair function and lead to microsatellite instability a hallmark of cancer cells in this disorder. Furthermore alterations in the MSH2 protein also relate to glioblastomas with correlations observed between MSH2 expression levels and tumor progression. These conditions exemplify the important role of MSH2 and its interaction with other DNA repair proteins in preventing cancerous developments.

Product promise

Tested

We have tested this species and application combination and it works. It is covered by our product promise.

Expected

We have not tested this specific species and application combination in-house, but expect it will work. It is covered by our product promise.

Predicted

This species and application combination has not been tested, but we predict it will work based on strong homology. However, this combination is not covered by our product promise.

Not recommended

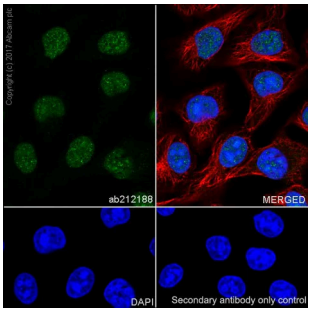
We do not recommend this combination. It is not covered by our product promise.

We are dedicated to supporting your work with high quality reagents and we are here for you every step of the way should you need us.

In the unlikely event of one of our products not working as expected, you are covered by our product promise.

Full details and terms and conditions can be found here:
Terms & Conditions.

8 product images

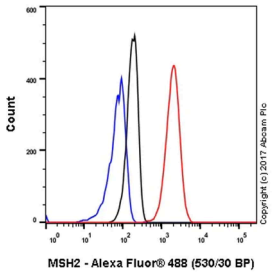


Immunocytochemistry/ Immunofluorescence - Anti-MSH2 antibody [EPR21017-2] (ab212188)

MSH2 Immunocytochemistry/ Immunofluorescence staining using rabbit Anti-MSH2 antibody

Immunofluorescent analysis of 100% methanol-fixed A-375 (human malignant melanoma cell line) cells labeling MSH2 with ab212188 at 1/100 dilution, followed by Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) (ab150077) secondary antibody at 1/1000 dilution (green). Nuclear staining in A-375 cell line is shown.
The nuclear counter stain is DAPI (blue). Tubulin is detected with Anti-alpha Tubulin antibody [DM1A] - Microtubule Marker (Alexa Fluor® 594) (ab195889) (red) at 1/200 dilution.

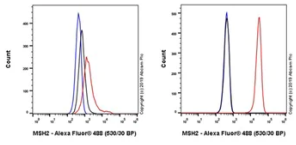
Secondary antibody only control: Used PBS instead of primary antibody, secondary antibody is Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) (ab150077) secondary antibody at 1/1000 dilution.



Flow Cytometry (Intracellular) - Anti-MSH2 antibody [EPR21017-2] (ab212188)

MSH2 Flow Cytometry (Intracellular) staining using rabbit Anti-MSH2 antibody

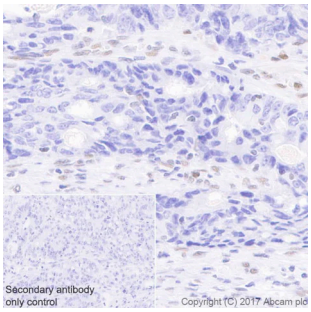
Intracellular flow cytometric analysis of 4% paraformaldehyde-fixed, 90% methanol-permeabilized A-375 (humanmalignant melanoma cell line) cell line labeling MSH2 with ab212188 at 1/600 dilution (red) compared with a Rabbit IgG, monoclonal [EPR25A] - Isotype Control (ab172730) (black) and an unlabeled control (cells without incubation with primary antibody and secondary antibody) (blue). Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) (ab150077) at 1/2000 dilution was used as the secondary antibody.



Flow Cytometry (Intracellular) - Anti-MSH2 antibody [EPR21017-2] (ab212188)

MSH2 Flow Cytometry (Intracellular) staining using rabbit Anti-MSH2 antibody

MSH2 KO HAP1 (MSH2 knockout Human chronic myelogenous leukemia near-haploid cell line, Left) / WT HAP1 (Right) cells were fixed with4% paraformaldehyde and permeabilised with 90% methanol. **The cells were incubated with the primary antibody, ab212188 at a 1/6000 dilution (0.01µg) (red line). The secondary antibody used wasGoat anti rabbit IgG (Alexa Fluor® 488, ab150077) at a 1/2000 dilution. The isotype control (black line) antibody wasRabbit monoclonal IgG (ab172730). An unlabelled control without incubation with primary antibody and secondary antibody was also performed (blue line).**
90% methanol permeabilisation is recommended. Avoid using TritonX-100 as it may cause non-specific staining.

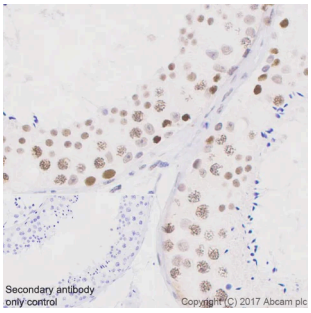


Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-MSH2 antibody [EPR21017-2] (ab212188)

MSH2 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using rabbit Anti-MSH2 antibody

Immunohistochemical analysis of paraffin-embedded human colon cancer tissue labeling MSH2 with ab212188 at 1/10000 dilution, followed by a ready to use Goat Anti-Rabbit IgG H&L (HRP). Nuclear staining only in the stromal cells of human colon cancer; no staining observed in the tumor cells (PMID: 24710284). Counter stained with Hematoxylin.
Secondary antibody only control: Used PBS instead of primary antibody, secondary antibody is a ready to use Goat Anti-Rabbit IgG H&L (HRP).

Perform heat mediated antigen retrieval using ab93684 (Tris/EDTA buffer, pH 9.0).

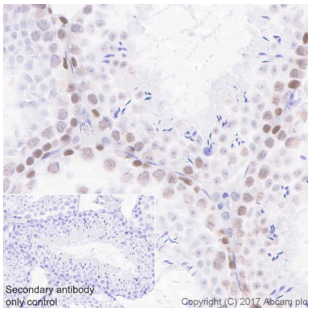


Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-MSH2 antibody [EPR21017-2] (ab212188)

MSH2 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using rabbit Anti-MSH2 antibody

Immunohistochemical analysis of paraffin-embedded human testis tissue labeling MSH2 with ab212188 at 1/10000 dilution, followed by a ready to use Goat Anti-Rabbit IgG H&L (HRP). Nuclear staining in human testis was observed (PMID: 10029069). Counter stained with Hematoxylin.
Secondary antibody only control: Used PBS instead of primary antibody, secondary antibody is a ready to use Goat Anti-Rabbit IgG H&L (HRP).

Perform heat mediated antigen retrieval using ab93684 (Tris/EDTA buffer, pH 9.0).

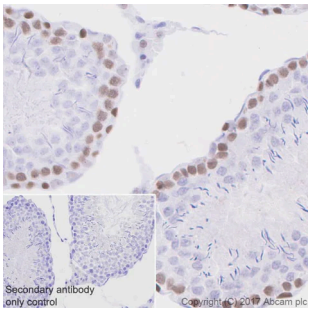


Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-MSH2 antibody [EPR21017-2] (ab212188)

MSH2 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using rabbit Anti-MSH2 antibody

Immunohistochemical analysis of paraffin-embedded mouse testis tissue labeling MSH2 with ab212188 at 1/10000 dilution, followed by a ready to use Goat Anti-Rabbit IgG H&L (HRP). Nuclear staining in mouse testis was observed (PMID: 10029069). Counter stained with Hematoxylin.
Secondary antibody only control: Used PBS instead of primary antibody, secondary antibody is a ready to use Goat Anti-Rabbit IgG H&L (HRP).

Perform heat mediated antigen retrieval using ab93684 (Tris/EDTA buffer, pH 9.0).



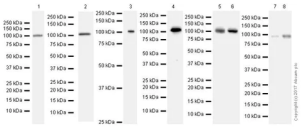
Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-MSH2 antibody [EPR21017-2] (ab212188)

MSH2 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using rabbit Anti-MSH2 antibody

Immunohistochemical analysis of paraffin-embedded rat testis tissue labeling MSH2 with ab212188 at 1/10000 dilution, followed by a ready to use Goat Anti-Rabbit IgG H&L (HRP). Nuclear

staining was mainly observed in the spermatogonia in rat testis (PMID: 10029069). Counter stained with Hematoxylin.
Secondary antibody only control: Used PBS instead of primary antibody, secondary antibody is a ready to use Goat Anti-Rabbit IgG H&L (HRP).

Perform heat mediated antigen retrieval using ab93684 (Tris/EDTA buffer, pH 9.0).



Western blot - Anti-MSH2 antibody [EPR21017-2] (ab212188)

Blocking/Dilution buffer: 5% NFDM/TBST.
The blot was developed on a BIO-RAD® ChemiDoc™ MP instrument.

All lanes:
Western blot - Anti-MSH2 antibody [EPR21017-2] (ab212188) at 1/1000 dilution

Lane 1:
Rat testis lysate at 20 µg

Lane 2:
HeLa (human epithelial cell line from cervix adenocarcinoma) whole cell lysate at 10 µg

Lane 3:
Human tonsil lysate at 10 µg

Lane 4:
A-375 (human malignant melanoma cell line) whole cell lysate at 10 µg

Lane 5:
C6 (rat glial tumor cell line) whole cell lysate at 10 µg

Lane 6:
RAW 264.7 (mouse macrophage cell line transformed with Abelson murine leukemia virus) whole cell lysate at 10 µg

Lane 7:
Human fetal heart lysate at 10 µg

Lane 8:
Human fetal kidney lysate at 10 µg

Secondary

All lanes:
Western blot - Goat Anti-Rabbit IgG H&L (HRP) (ab97051) at 1/100000 dilution

Developed using the ECL technique.

Predicted band size: 105 kDa

Observed band size: 104 kDa

Exposure time: 3min

Please note: All products are 'FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC OR THERAPEUTIC PROCEDURES'.