**Overview**

**Product name**: Anti-PMS2 antibody [EPR3947] 

**Description**: Rabbit monoclonal [EPR3947] to PMS2

**Host species**: Rabbit

**Tested applications**: Suitable for: WB, IP, IHC-P, ICC/IF, Flow Cyt

**Species reactivity**: Reacts with: Human

**Immunogen**: Synthetic peptide within Human PMS2 aa 1-100. The exact sequence is proprietary.

**Positive control**: WB: Wild-type HAP1 cell lysate; Jurkat, HeLa, SH-SY5Y and SKBR3 cell lysates. IHC-P: Human colon and colon adenocarcinoma tissue. ICC/IF: HeLa and Raji cells. Flow cyt: HeLa 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.

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 production

For more information see here.

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

**Properties**

**Form**: Liquid

**Storage instructions**: Shipped at 4°C. Store at -20°C. Stable for 12 months at -20°C.

**Dissociation constant ($K_D$)**: $K_D = 1.50 \times 10^{-10}$ M

Learn more about $K_D$
Storage buffer
pH: 7.20
Preservative: 0.01% Sodium azide
Constituents: 9% PBS, 40% Glycerol (glycerin, glycerine), 0.05% BSA, 50% Tissue culture supernatant

Purity
Tissue culture supernatant

Clonality
Monoclonal

Clone number
EPR3947

Isotype
IgG

Applications
Our Abpromise guarantee covers the use of ab110638 in the following tested applications.

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

<table>
<thead>
<tr>
<th>Application</th>
<th>Abreviews</th>
<th>Notes</th>
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<tbody>
<tr>
<td>WB</td>
<td>★★★★☆</td>
<td>1/1000 - 1/10000. Detects a band of approximately 110 kDa (predicted molecular weight: 96 kDa).</td>
</tr>
<tr>
<td>IP</td>
<td></td>
<td>1/10 - 1/100.</td>
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<tr>
<td>IHC-P</td>
<td></td>
<td>1/100 - 1/250. Perform heat mediated antigen retrieval with citrate buffer pH 6 before commencing with IHC staining protocol.</td>
</tr>
<tr>
<td>ICC/IF</td>
<td>★★★★★</td>
<td>1/100 - 1/250.</td>
</tr>
<tr>
<td>Flow Cyt</td>
<td></td>
<td>1/1000. ab172730 - Rabbit monoclonal IgG, is suitable for use as an isotype control with this antibody.</td>
</tr>
</tbody>
</table>

Target

Function
Component of the post-replicative DNA mismatch repair system (MMR). Heterodimerizes with MLH1 to form MutL alpha. DNA repair is initiated by MutS alpha (MSH2-MSH6) or MutS beta (MSH2-MSH6) 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.

Involvement in disease
Defects in PMS2 are the cause of hereditary non-polyposis colorectal cancer type 4 (HNPCC4) [MIM:600259]. 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, and accounts for 15% of all colon cancers. 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.

Defects in PMS2 are a cause of mismatch repair cancer syndrome (MMRCS) [MIM:276300]; also known as Turcot syndrome or brain tumor-polyposis syndrome 1 (BTPS1). MMRCS is an autosomal dominant disorder characterized by malignant tumors of the brain associated with multiple colorectal adenomas. Skin features include sebaceous cysts, hyperpigmented and cafe au lait spots.

Sequence similarities
Belongs to the DNA mismatch repair mutL/hexB family.

Cellular localization
Nucleus.

Images

**All lanes:** Anti-PMS2 antibody [EPR3947] (ab110638) at 1/1000 dilution

**Lane 1:** Wild-type HeLa cell lysate  
**Lane 2:** PMS2 knockout HeLa cell lysate  
**Lane 3:** Wild-type HAP1 cell lysate  
**Lane 4:** PMS2 knockout HAP1 cell lysate

Lysates/proteins at 20 µg per lane.

Performed under reducing conditions.

**Predicted band size:** 96 kDa

**Lanes 1-4:** Merged signal (red and green). Green - ab110638 observed at 120 kDa. Red - loading control ab8245 observed at 37 kDa.

ab110638 Anti-PMS2 antibody [EPR3947] was shown to specifically react with PMS2 in wild-type HeLa cells. Loss of signal was observed when knockout cell line ab261776 (knockout cell...
lysate ab257142) was used. Wild-type and PMS2 knockout samples were subjected to SDS-PAGE. ab110638 and Anti-GAPDH antibody [6C5] - Loading Control (ab8245) were incubated overnight at 4°C at 1 in 1000 dilution and 1 in 20000 dilution respectively. Blots were developed with Goat anti-Rabbit IgG H&L (IRDye® 800CW) preadsorbed (ab216773) and Goat anti-Mouse IgG H&L (IRDye® 680RD) preadsorbed (ab216776) secondary antibodies at 1 in 20000 dilution for 1 hour at room temperature before imaging.

Immunohistochemical analysis of paraffin-embedded Human colon tissue labeling PMS2 with ab110638, followed by a ready to use Goat Anti-Rabbit IgG H&L (HRP). Positive staining on human colon. The section was incubated with ab229902 for 30 mins at room temperature. The immunostaining was performed on a Leica Biosystems BOND® RX instrument. Counterstained with Hematoxylin. Heat mediated antigen retrieval using ab93684 (Tris/EDTA buffer, pH 9.0).

Secondary antibody only control: Used PBS instead of primary antibody, secondary antibody is a ready to use Goat Anti-Rabbit IgG H&L (HRP).

All lanes:

Lane 1: Wild-type HAP1 whole cell lysate
Lane 2: PMS2 knockout HAP1 whole cell lysate

Lysates/proteins at 30 µg per lane.

Predicted band size: 96 kDa

Lanes 1-2: Merged signal (red and green). Green - ab110638 observed at 120 kDa. Red - loading control, ab8245, observed at 37 kDa.

ab110638 was shown to specifically react with PMS2 in wild-type
HAP1 cells. No band was observed when PMS2 knockout samples were used. Wild-type and PMS2 knockout samples were subjected to SDS-PAGE. Ab110638 and ab8245 (Mouse anti GAPDH loading control) were incubated overnight at 4°C at 1/1000 dilution and 1/20000 dilution respectively. Blots were developed with Goat anti-Rabbit IgG H&L (IRDye® 800CW) preabsorbed ab216773 and Goat anti-Mouse IgG H&L (IRDye® 680RD) preabsorbed ab216776 secondary antibodies at 1/20000 dilution for 1 hour at room temperature before imaging.

Immunofluorescent analysis of 0.1% TritonX-100-fixed, DAPI permeabilized Raji (human burkitt’s lymphoma b lymphocyte) cells labelling PMS2 with ab110638 at 1/500 dilution, followed by ab150077 AlexaFluor®488 Goat anti-Rabbit secondary antibody at 1/1000 dilution (Green). Confocal image showing nuclear staining in Raji cells. 4% Paraformaldehyde was used to counterstain tubulin at dilution (Red). The Nuclear counterstain was DAPI (Blue).

Secondary antibody only control: Used PBS instead of primary antibody, secondary antibody is ab150077 AlexaFluor®488 Goat anti-Rabbit secondary at 1/1000 dilution.

Overlay histogram showing HeLa cells stained with ab110638 (red line). The cells were fixed with 80% methanol (5 min) and then permeabilized with 0.1% PBS-Tween for 20 min. The cells were then incubated in 1x PBS / 10% normal goat serum / 0.3M glycine to block non-specific protein-protein interactions followed by the antibody (ab110638, 1/1000 dilution) for 30 min at 22°C. The secondary antibody used was Alexa Fluor® 488 goat anti-rabbit IgG (H+L) (ab150077) at 1/2000 dilution for 30 min at 22°C. Isotype control antibody (black line) was rabbit IgG (monoclonal) (0.1μg/1x10⁶ cells) used under the same conditions. Unlabelled sample (blue line) was also used as a control. Acquisition of >5,000 events were collected using a 20mW Argon ion laser (488nm) and 525/30 bandpass filter.
Other - Anti-PMS2 antibody [EPR3947] (ab110638)

Equilibrium disassociation constant (K_D)
Learn more about K_D

Click here to learn more about K_D

ab110638 at 1/100 dilution staining PMS2 in Human colonic adenocarcinoma by Immunohistochemistry, Paraffin-embedded tissue.

Perform heat mediated antigen retrieval with citrate buffer pH 6 before commencing with IHC staining protocol.

Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-PMS2 antibody [EPR3947] (ab110638)

Anti-PMS2 antibody [EPR3947] (ab110638) at 1/1500 dilution + HeLa (Human cervix adenocarcinoma epithelial cell) Whole cell lysates at 15 µg

Secondary
Goat Anti-Rabbit IgG H&L (HRP) (ab97051) at 1/20000 dilution

Predicted band size: 96 kDa
Observed band size: 110 kDa

why is the actual band size different from the predicted?

Blocking/diluting buffer and concentration: 5% NFDM/TBST.
Exposure time: 50 seconds
Western blot - Anti-PMS2 antibody [EPR3947] (ab110638)

All lanes : Anti-PMS2 antibody [EPR3947] (ab110638) at 1/1000 dilution

Lane 1 : Jurkat cell lysate
Lane 2 : HeLa cell lysate
Lane 3 : SH SY5Y cell lysate
Lane 4 : SKBR3 cell lysate

Lysates/proteins at 10 µg per lane.

Predicted band size: 96 kDa
Observed band size: 110 kDa why is the actual band size different from the predicted?

Immunocytochemistry/ Immunofluorescence analysis of HeLa cell labeling PMS2 with ab110638 at 1/400 dilution. Goat anti-Rabbit Alexa fluor®488 at 1/200 was used as the secondary antibody. Cells were fixed with Paraformaldehyde and permeabilised with 0.5% Triton-X100 in PBS.

ab110638 at 1/100 dilution staining PMS2 in HeLa cells by Immunofluorescence.

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