abcam

ab133534

Anti-Rad51 antibody [EPR4030(3)]

Anti-Rad51 antibody [EPR4030(3)] (ab133534) is a rabbit monoclonal antibody detecting Rad51 in **Western Blot, Flow Cytometry (Intra), IP, IHC-P, ICC/IF**. Suitable for **Human, Mouse, Rat**.

- Biophysical QC for unrivalled batch-batch consistency
- Over 150 publications

Recombinant | RabMAb | 20ul selling size

Key facts

Isotype	IgG
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	EPR4030(3)
Purification technique	Affinity purification Protein A
Dissociation constant	9.2×10^{-11} M
Concentration	1.792 mg/mL The concentration of this product may be batch-dependent Batch concentration finder →

Reactivity data

IHC-P

Tested

Species	Human
Dilution info	1/100 - 1/500
Notes	Perform heat-mediated antigen retrieval before commencing with IHC staining protocol.

Expected

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

IP

Tested

Species	Human
Dilution info	1/10 - 1/100
Notes	-

Expected

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

WB

Tested

Species	Mouse
Dilution info	1/10000 - 1/20000
Notes	-

Species	Rat
Dilution info	1/10000 - 1/20000

Notes	-

Species	Human
Dilution info	1/10000 - 1/20000
Notes	-

ICC/IF

Tested

Species	Human
Dilution info	1/250
Notes	-

Expected

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

Flow Cyt (Intra)

Tested

Species	Human
Dilution info	1/200 - 1/1000
Notes	ab172730 - Rabbit monoclonal IgG, is suitable for use as an isotype control with this antibody.

Expected

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

Target data

See full target information RAD51

Function	Plays an important role in homologous strand exchange, a key step in DNA repair through homologous recombination (HR) (PubMed:12205100, PubMed:18417535, PubMed:20231364, PubMed:20348101, PubMed:22325354, PubMed:23509288, PubMed:23754376, PubMed:26681308, PubMed:28575658, PubMed:32640219). Binds to single-stranded DNA in an ATP-dependent manner to form nucleoprotein filaments which are essential for the homology search and strand exchange (PubMed:12205100, PubMed:18417535, PubMed:15226506, PubMed:20231364, PubMed:20348101, PubMed:23509288, PubMed:23754376, PubMed:26681308, PubMed:28575658). Catalyzes the recognition of homology and strand exchange between homologous DNA partners to form a joint molecule between a processed DNA break and the repair template (PubMed:12205100, PubMed:18417535, PubMed:20231364, PubMed:20348101, PubMed:23509288, PubMed:23754376, PubMed:26681308, PubMed:28575658, PubMed:38459011). Recruited to resolve stalled replication forks during replication stress (PubMed:27797818, PubMed:31844045). Part of a PALB2-scaffolded HR complex containing BRCA2 and RAD51C and which is thought to play a role in DNA repair by HR (PubMed:12442171, PubMed:24141787). Plays a role in regulating mitochondrial DNA copy number under conditions of oxidative stress in the presence of RAD51C and XRCC3 (PubMed:20413593). Also involved in interstrand cross-link repair (PubMed:26253028).

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	Stable for 12 months at -20°C

Notes

Anti-Rad51 antibody [EPR4030(3)] (ab133534) was developed by Abcam using patented rabbit monoclonal antibody technology and is validated for use in Flow Cyt (Intra), ICC/IF, IHC-P, IP and WB.

Anti-Rad51 antibody [EPR4030(3)] (ab133534) was first used in a scientific publication in 2013 and has been cited over 151 times in peer reviewed journals. It's performance in Western Blot and immunofluorescence in human samples is trusted by the scientific community.

Abcam's high quality manufacturing and validation processes ensure Anti-Rad51 antibody [EPR4030(3)] (ab133534) has high sensitivity and specificity alongside high lot-to-lot consistency and reproducibility.

Anti-Rad51 antibody [EPR4030(3)] (ab133534) has 13 independent reviews from customers.

Anti-Rad51 antibody [EPR4030(3)] (ab133534) specifically detects Rad51 (UniProt ID: Q06609; Molecular weight: 37kDa) and is sold in 100 µL and 1 mL selling sizes.

Conjugation-ready, carrier free format available for antibody clone EPR4030(3) - ab221796.

Antibody clone EPR4030(3) is also available pre-conjugated to a variety of labels for your convenience - PE, APC, HRP, Alkaline Phosphatase, Alexa Fluor® 488, Alexa Fluor® 647, Alexa Fluor® 594, Alexa Fluor® 555, Alexa Fluor® 568, Alexa Fluor® 750 (ab303002, ab303003, ab303004, ab308698, ab309674, ab310037, ab310418, ab311945, ab312416, ab321050).

Highly-cited antibody with >250 citations. A highly validated Rad51 antibody, essential for researchers studying DNA repair and homologous recombination. This antibody is crucial in genome stability research, particularly in understanding the DNA damage response. It is widely used in studies of Rad51 foci, cancer therapy and Rad51 inhibitors.

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	RAD51 also known as recombination protein A or Novus RAD51 is a DNA repair protein with a molecular mass of approximately 37 kDa. This protein plays a significant role in homologous recombination and is active in the repair of double-strand breaks in DNA. It is expressed in various tissues with high levels seen in rapidly dividing cells. RAD51 acts by forming nucleoprotein filaments on single-stranded DNA and facilitates the search for homology and strand pairing during the repair process.
Biological function summary	Processes involving RAD51 are essential for genomic stability and cellular response to DNA damage. RAD51 often functions as part of a repair complex along with other proteins such as BRCA2 and RPA. This complex binds and stabilizes single-stranded DNA during search and strand invasion which is vital for successful

	recombination repair. Such repair mechanisms are important for preventing chromosomal aberrations and maintaining genetic integrity.
Pathways	RAD51's activity fits into the broader context of DNA damage repair pathways notably the homologous recombination (HR) pathway. This pathway is important for repairing double-strand breaks utilizing other proteins such as ATM and ATR to signal repair processes. Furthermore RAD51 interacts with various members of the BRCA protein family combining efforts to ensure proper DNA damage response and repair.
Associated diseases and disorders	RAD51 mutations or dysregulation are linked to various types of cancer including breast and ovarian cancers. These cancers may involve mutations in BRCA1 and BRCA2 genes which affect RAD51's ability to effectively perform homologous recombination. Additionally disruptions in RAD51 function are associated with Fanconi anemia a disorder characterized by DNA repair defects. This condition demonstrates the importance of RAD51's interaction with FA pathway proteins in maintaining genomic stability and preventing disease.

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

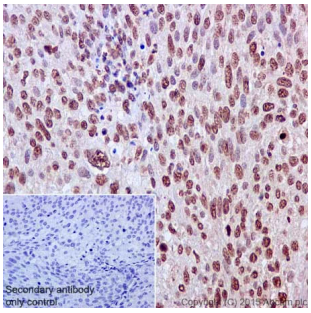
We do not recommend this combination. It is not covered by our product promise.

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.

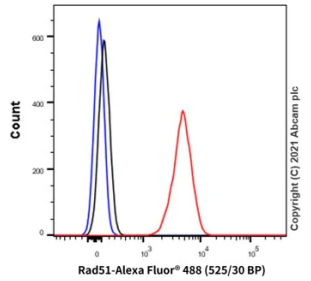
15 product images



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Rad51 antibody [EPR4030(3)] (ab133534)

Rad51 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using rabbit Anti-Rad51 antibody

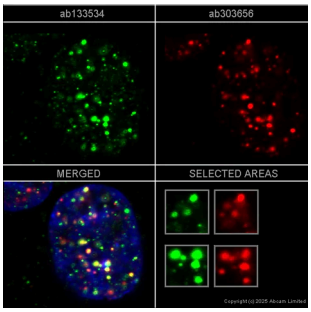
Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) analysis of human cervix carcinoma tissue labelling Rad51 with purified ab133534 at 1/500. Heat mediated antigen retrieval was performed using Tris/EDTA buffer pH 9. ab97051, a HRP-conjugated goat anti-rabbit IgG (H+L) was used as the secondary antibody (1/500). Negative control using PBS instead of primary antibody. Counterstained with hematoxylin.



Flow Cytometry (Intracellular) - Anti-Rad51 antibody [EPR4030(3)] (ab133534)

Rad51 Flow Cytometry (Intracellular) staining of A431 (human epidermoid carcinoma epithelial cell) cells using rabbit Anti-Rad51 antibody

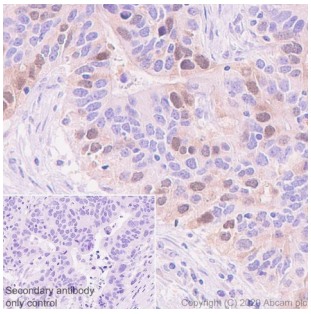
Intracellular Flow Cytometry analysis of A431 (human epidermoid carcinoma epithelial cell) labelling Rad51 with purified ab133534 at 1/200 (red). Cells were fixed with 4% paraformaldehyde. A Goat anti rabbit IgG (Alexa Fluor® 488 ab150077 (1/2000) was used as the secondary antibody. Black - Isotype control, (ab172730) rabbit monoclonal IgG. Blue - Unlabelled control, cells without incubation with primary and secondary antibodies.



Immunocytochemistry/ Immunofluorescence - Anti-Rad51 antibody [EPR4030(3)] (ab133534)

Rad51 Immunocytochemistry/ Immunofluorescence staining of UV-treated HCT116 cells using rabbit Anti-Rad51 antibody

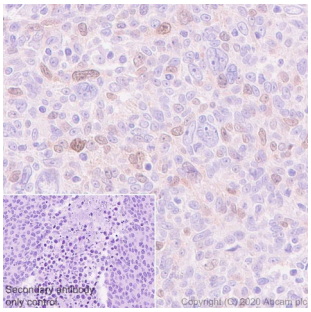
Immunofluorescent analysis of HCT116 cells treated with 20 J/m² UV energy 24 hours after seeding, followed by a further 24-hour incubation prior to fixation. Cells were fixed with 4% PFA and permeabilized with 0.1% Triton X-100. Rad51 was labelled with ab133534 at 0.2 µg/ml (shown in green). ab303656 Anti-gamma H2A.X (phospho S139) antibody [N1-431] was used as a DNA damage counterstain at 0.2 µg/ml (shown in red). The secondary antibodies used were ab150081 Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) preadsorbed and ab150120 Goat Anti-Mouse IgG H&L (Alexa Fluor® 594) preadsorbed, both used at a 1/1000 dilution (2 µg/ml). The image shows selected areas of overlapping foci. The nuclear counterstain was DAPI.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Rad51 antibody [EPR4030(3)] (ab133534)

Rad51 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining of human colonic carcinoma tissue using rabbit Anti-Rad51 antibody

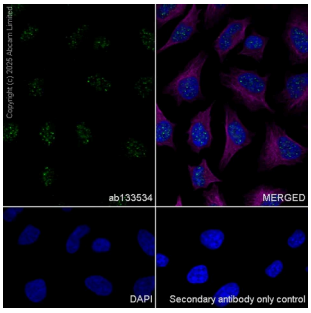
This data was produced using the same antibody clone but in a different formulation (ab221796). Immunohistochemistry (PFA-fixed paraffin-embedded sections) analysis of human colonic carcinoma tissue labelling with ab221796 at 0.54µg/mL. Heat mediated antigen retrieval was performed using ab93684 (Tris/EDTA buffer pH 9). A HRP-conjugated goat anti-rabbit IgG (H+L) was used as the secondary antibody. Counterstained with hematoxylin.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Rad51 antibody [EPR4030(3)] (ab133534)

Rad51 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining of human lung carcinoma tissue using rabbit Anti-Rad51 antibody

This data was produced using the same antibody clone but in a different formulation (ab221796). Immunohistochemistry (PFA-fixed paraffin-embedded sections) analysis of human lung carcinoma tissue labelling with ab221796 at 0.54µg/mL. Heat mediated antigen retrieval was performed using ab92684 (Tris/EDTA buffer pH 9). A HRP-conjugated goat anti-rabbit IgG (H+L) was used as the secondary antibody. Counterstained with hematoxylin.



Immunocytochemistry/ Immunofluorescence - Anti-Rad51 antibody [EPR4030(3)] (ab133534)

Rad51 Immunocytochemistry/ Immunofluorescence staining of HeLa cell line using rabbit Anti-Rad51 antibody

Immunofluorescent analysis of 100% Methanol-fixed, 0.1% TritonX-100 permeabilized HeLa (human cervical adenocarcinoma epithelial cell) cells labelling RAD51 with ab133534 at 1/250 dilution, followed by Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) preadsorbed (ab150081) antibody at 1/1000 dilution (Green).

Confocal image showing nuclear staining in HeLa cell line (shown in green).

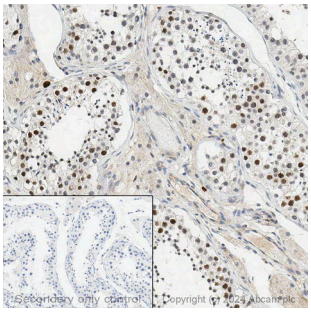
The counterstain was observed in magenta.

Nuclear DNA was labelled with DAPI (shown in blue).

Image was taken with a confocal microscope (Leica-Microsystems, TCS SP8).

Anti-alpha Tubulin antibody [DM1A] - Microtubule Marker (Alexa Fluor® 594) (ab195889) was used to counterstain tubulin at 1/200 dilution (Magenta).

Secondary antibody only control: Secondary antibody is Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) preadsorbed (ab150081) at 1/1000 dilution.

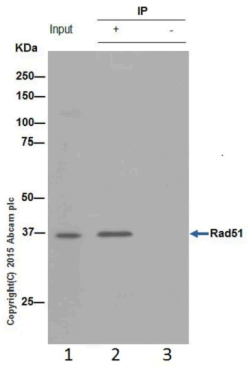


Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-Rad51 antibody [EPR4030(3)] (ab133534)

Immunohistochemical analysis of formalin fixed paraffin embedded human testis labelling Rad51 with ab133534 at a concentration of 1 µg/ml. The immunostaining was performed on a Ventana DISCOVERY ULTRA (Roche Tissue Diagnostics) instrument with a OptiView DAB IHC Detection Kit. Heat mediated antigen retrieval was performed with DISCOVERY cell conditioning solution (CC1) 100°C, pH8.5 for 32mins.

ab133534 Anti-Rad51 antibody [EPR4030(3)] was incubated for 16mins at 37°C. Sections were counterstained with Hematoxylin II. Image inset shows absence of staining in secondary antibody only control.

Customers are encouraged to optimise antigen retrieval conditions, antibody concentration, incubation times and temperature for best results in their own IHC assay workflow (automated and manual)



Immunoprecipitation - Anti-Rad51 antibody [EPR4030(3)] (ab133534)

ab133534 (purified) at 1/100 immunoprecipitating Rad51 in HEK-293 (human epithelial cell line from embryonic kidney) whole cell lysate.
Lane 1 (input): HEK-293 whole cell lysate (10µg)

Lane 2 (+): ab133534 + HEK-293 whole cell lysate.

Lane 3 (-): Rabbit monoclonal IgG (ab172730) instead of ab133534 in HEK-293 whole cell lysate.

For western blotting, a HRP-conjugated anti-rabbit IgG, specific to the non-reduced form of IgG was used as the secondary antibody (1/1500).

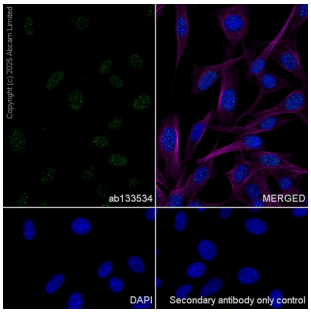
Blocking buffer and concentration: 5% NFDM/TBST.

Diluting buffer and concentration: 5% NFDM /TBST.

All lanes:
Immunoprecipitation - Anti-Rad51 antibody [EPR4030(3)] (ab133534)

Predicted band size: 36 kDa

Observed band size: 37 kDa



Immunocytochemistry/ Immunofluorescence - Anti-Rad51 antibody [EPR4030(3)] (ab133534)

Rad51 Immunocytochemistry/ Immunofluorescence staining of NIH/3T3 cell line using rabbit Anti-Rad51 antibody

Immunofluorescent analysis of 100% Methanol-fixed, 0.1% TritonX-100 permeabilized NIH/3T3 (mouse embryonic fibroblast) cells labelling RAD51 with ab133534 at 1/250 dilution, followed by Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) preadsorbed (ab150081) antibody at 1/1000 dilution (Green).

Confocal image showing nuclear staining in NIH/3T3 cell line (shown in green).

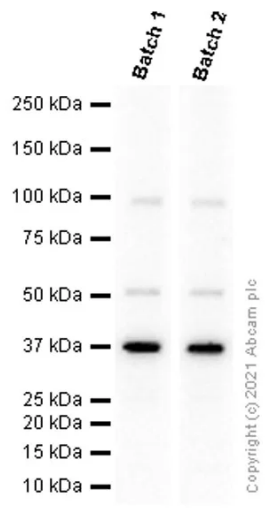
The counterstain was observed in magenta.

Nuclear DNA was labelled with DAPI (shown in blue).

Image was taken with a confocal microscope (Leica-Microsystems, TCS SP8).

Anti-alpha Tubulin antibody [DM1A] - Microtubule Marker (Alexa Fluor® 594) (ab195889) was used to counterstain tubulin at 1/200 dilution (Magenta).

Secondary antibody only control: Secondary antibody is Goat Anti-Rabbit IgG H&L (Alexa Fluor® 488) preadsorbed (ab150081) at 1/1000 dilution.

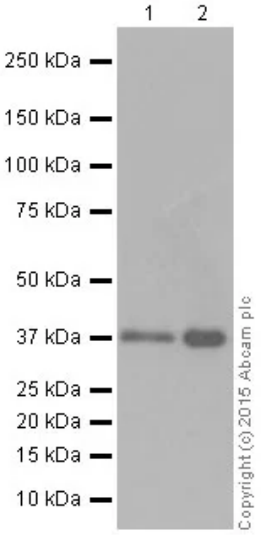


Western blot - Anti-Rad51 antibody [EPR4030(3)] (ab133534)

Rad51 Western blot staining using rabbit Anti-Rad51 antibody

Different batches of ab133534 were tested on HEK-293 (Human embryonic kidney epithelial cell) lysate at 2.1 µg/ml. 15 µg of lysate was loaded in each lane. Bands observed at 37 kDa.
All lanes:
Western blot - Anti-Rad51 antibody [EPR4030(3)] (ab133534)

Predicted band size: 36 kDa



Western blot - Anti-Rad51 antibody [EPR4030(3)] (ab133534)

Rad51 Western blot staining using rabbit Anti-Rad51 antibody

Blocking and dilution buffer: 5% NFDM/TBST.
All lanes:
Western blot - Anti-Rad51 antibody [EPR4030(3)] (ab133534) at 1/20000 dilution

Lane 1:
HEK-293 (human epithelial cell line from embryonic kidney) whole cell lysate at 20 µg

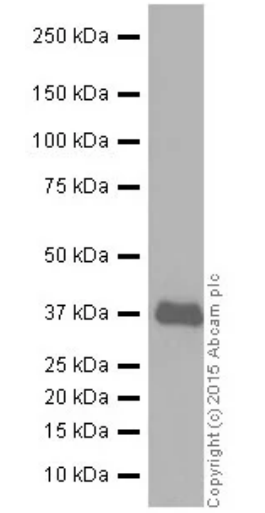
Lane 2:
Jurkat (human T cell leukemia cell line from peripheral blood) whole cell lysate at 20 µg

Secondary

All lanes:
Western blot - Goat Anti-Rabbit IgG H&L (HRP) (ab97051) at 1/50000 dilution

Predicted band size: 36 kDa

Observed band size: 37 kDa



Western blot - Anti-Rad51 antibody [EPR4030(3)] (ab133534)

Rad51 Western blot staining of K562 (human chronic myelogenous leukemia cell line from bone marrow) whole cell lysate using rabbit Anti-Rad51 antibody

Blocking and dilution buffer: 5% NFDM/TBST.
All lanes:
Western blot - Anti-Rad51 antibody [EPR4030(3)] (ab133534) at 1/10000 dilution

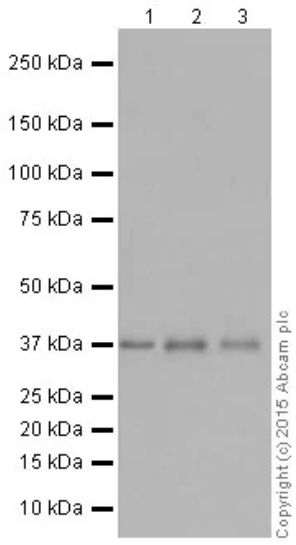
All lanes:
K562 (human chronic myelogenous leukemia cell line from bone marrow) whole cell lysate at 20 µg

Secondary

All lanes:
Western blot - Goat Anti-Rabbit IgG H&L (HRP) (ab97051) at 1/50000 dilution

Predicted band size: 36 kDa

Observed band size: 37 kDa



Western blot - Anti-Rad51 antibody [EPR4030(3)] (ab133534)

Rad51 Western blot staining using rabbit Anti-Rad51 antibody

Blocking and dilution buffer: 5% NFDM/TBST.
All lanes:
Western blot - Anti-Rad51 antibody [EPR4030(3)] (ab133534) at 1/10000 dilution

Lane 1:
C6 (rat glial tumor cell line) whole cell lysate at 20 µg

Lane 2:
Mouse spleen tissue lysate at 20 µg

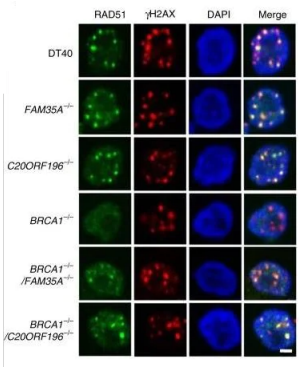
Lane 3:
NIH/3T3 (mouse embryo fibroblast cell line) whole cell lysate at 20 µg

Secondary

All lanes:
Western blot - Goat Anti-Rabbit IgG H&L (HRP) (ab97051) at 1/50000 dilution

Predicted band size: 36 kDa

Observed band size: 37 kDa



Gao et al Nat Commun. 2018; 9: 3925. Published online 2018 Sep 25. doi: 10.1038/s41467-018-06407-7

Immunocytochemistry/ Immunofluorescence - Anti-Rad51 antibody [EPR4030(3)] (ab133534)

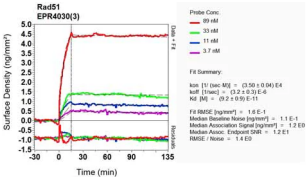
Rad51 Immunocytochemistry/ Immunofluorescence staining using rabbit Anti-Rad51 antibody

Immunocytochemical analysis of DT40 cells (WT and the indicated KOs) labeling Rad51 using ab133534 at 1/200 dilution.

From Figure 5d of gao et al.

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OI-RD Scanning - Anti-Rad51 antibody [EPR4030(3)] (ab133534)

We have systematically measured KD (the equilibrium dissociation constant between the antibody and its antigen), of more than 840 recombinant antibodies to assess not only their individual KD values but also to see the average affinity of antibody. Based on the comparison with published literature values for mouse monoclonal antibodies, Recombinant antibodies appear to be on average 1-2 order of magnitude higher affinity.

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