abcam

ab188224

Anti-p21 antibody [EPR18021]

Anti-p21 antibody [EPR18021] (ab188224) is a rabbit monoclonal antibody detecting p21 in **Western Blot, Flow Cytometry (Intra), IP, IHC-P, ICC/IF**. Suitable for **Mouse**.

- Biophysical QC for unrivalled batch-batch consistency
- Over 160 publications

Lab Essentials | 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	EPR18021
Purification technique	Affinity purification Protein A
Specificity	Expression levels of the target protein vary between different tissue/cell lines and in some cases induction may be required before a signal is observed. This antibody is not recommended for use in WB with tissue samples.
Concentration	0.487 mg/mL The concentration of this product may be batch-dependent Batch concentration finder →

Reactivity data

IP

Tested

Species	Mouse
Dilution info	1/30
Notes	-

WB

Tested

Species	Mouse
Dilution info	1/1000
Notes	-

ICC/IF

Tested

Species	Mouse
Dilution info	1/500
Notes	-

Flow Cyt (Intra)

Tested

Species	Mouse
Dilution info	1/50
Notes	ab172730 - Rabbit monoclonal IgG, is suitable for use as an isotype control with this antibody.

IHC-P

Tested

Species	Mouse
Dilution info	1/1000
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 Cdkn1a

Function	May be involved in p53/TP53 mediated inhibition of cellular proliferation in response to DNA damage. Binds to and inhibits cyclin-dependent kinase activity, preventing phosphorylation of critical cyclin-dependent kinase substrates and blocking cell cycle progression. Functions in the nuclear localization and assembly of cyclin D-CDK4 complex and promotes its kinase activity towards RB1. At higher stoichiometric ratios, inhibits the kinase activity of the cyclin D-CDK4 complex (PubMed:25329316). Inhibits DNA synthesis by DNA polymerase delta by competing with POLD3 for PCNA binding (By similarity). Plays an important role in controlling cell cycle progression and DNA damage-induced G2 arrest (By similarity). Plays an important role in controlling cell cycle progression and DNA damage-induced G2 arrest (PubMed:37178686). Involved in p53/TP53 mediated inhibition of cellular proliferation in response to DNA damage. Also involved in p53-independent DNA damage-induced G2 arrest mediated by CREB3L1 in astrocytes and osteoblasts (PubMed:37178686). Binds to and inhibits cyclin-dependent kinase activity, preventing phosphorylation of critical cyclin-dependent kinase substrates and blocking cell cycle progression. Functions in the nuclear localization and assembly of cyclin D-CDK4 complex and promotes its kinase activity towards RB1. At higher stoichiometric ratios, inhibits the kinase activity of the cyclin D-CDK4 complex (PubMed:25329316). Inhibits DNA synthesis by DNA polymerase delta by competing with POLD3 for PCNA binding (By similarity). Negatively regulates the CDK4- and CDK6-driven phosphorylation of RB1 in keratinocytes, thereby resulting in the release of E2F1 and subsequent transcription of E2F1-driven G1/S phase promoting genes (PubMed:36689330).

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

Anti-p21 antibody [EPR18021] (ab188224) 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-p21 antibody [EPR18021] (ab188224) was first used in a scientific publication in 2017 and has been cited over 163 times in peer reviewed journals. It's performance in Western Blot in mouse samples is trusted by the scientific community.

Abcam's high quality manufacturing and validation processes ensure Anti-p21 antibody [EPR18021] (ab188224) has high sensitivity and specificity alongside high lot-to-lot consistency and reproducibility.

Anti-p21 antibody [EPR18021] (ab188224) has 11 independent reviews from customers.

Anti-p21 antibody [EPR18021] (ab188224) specifically detects p21 (UniProt ID: P39689; Molecular weight: 18kDa) and is sold in a convenient trial size to enable initial testing (20 µL) and larger sizes for subsequent scaling up experiments (100 µL and 1 mL).

Conjugation-ready, carrier free format available for antibody clone EPR18021 - ab232512.

Antibody clone EPR18021 is also available pre-conjugated to a variety of labels for your convenience - Alexa Fluor® 488, Alexa Fluor® 647, APC, PE (ab237264, ab237265, ab313956, ab314287).

p21 is a cyclin-dependent kinase inhibitor that regulates cell cycle progression, promoting cell cycle arrest in response to DNA damage. It plays a dual role in oncology by both suppressing tumor growth through cell cycle inhibition and contributing to cancer progression when localized in the cytoplasm.

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	The p21 protein also known as CDKN1A is an important regulator of cell cycle progression. It acts as a cyclin-dependent kinase inhibitor where it binds to and inhibits the activity of cyclin-CDK2 or -CDK4 complexes. The molecular weight of p21 is approximately 21 kDa. Cellular expression of p21 is diverse; it occurs in various tissues reflecting its broad role in maintaining cell cycle control. This

	protein's expression level is often assessed using techniques such as p21 western blotting p21 ELISA and p21 IHC staining.
Biological function summary	P21 plays a critical role in cell cycle regulation and DNA damage response. It associates with the p53 tumor suppressor protein forming an essential part of the p53 signaling pathway under stress conditions. p21 arrests cells in G1 phase allowing DNA repair or leading to cellular senescence. Through these mechanisms p21 integrates signals from stress and damage emphasizing its importance as a mediator in cellular checkpoint control.
Pathways	P21 is closely involved in the p53 and the Transforming Growth Factor-beta (TGF-β) signaling pathways. This integration helps in transmitting growth-inhibitory signals. p21 interacts with proteins such as p53 and cyclins ensuring precise regulation of the cell cycle and growth arrest when necessary. Triggered by p53 activation p21 contributes to preventing undisturbed cell proliferation acting as a safeguard against tumor formation.
Associated diseases and disorders	P21's deregulation associates with cancer and age-related diseases. Its impairment is a common feature in many cancers often linked with defects in the p53 pathway. Reduced p21 expression can contribute to unchecked cell division and tumor progression. Moreover in age-related diseases p21's role in promoting cellular senescence connects it with degenerative conditions. The intricate relationship between p21 and proteins such as p53 and cyclins highlights its potential as a therapeutic target for these disorders.

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

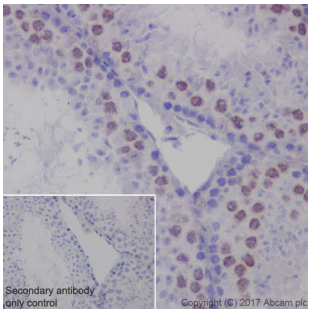
We do not recommend this combination. It is not covered by our product promise.

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:

10 product images



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-p21 antibody [EPR18021] (ab188224)

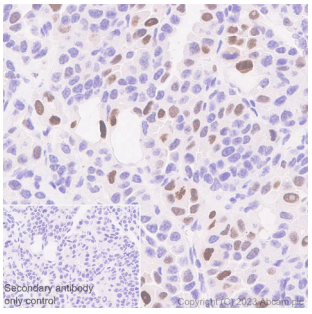
P21 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using rabbit Anti-p21 antibody

Immunohistochemical analysis of paraffin-embedded mouse testis tissue labeling p21 with ab188224 at 1/1000 dilution, followed by Goat Anti-Rabbit IgG H&L (HRP) (ab97051) at 1/500 dilution.
Nuclear staining on mouse testis is observed (PMID: 9170103).

Counter stained with Hematoxylin.

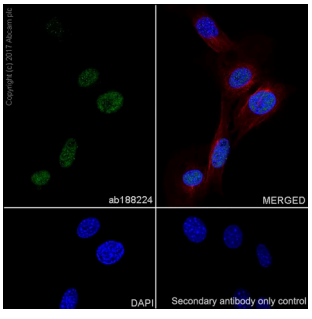
Secondary antibody only control: Used PBS instead of primary antibody, secondary antibody is Goat Anti-Rabbit IgG H&L (HRP) (ab97051) at 1/500 dilution.

Perform heat mediated antigen retrieval with Tris/EDTA buffer pH 9.0 before commencing with IHC staining protocol.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-p21 antibody [EPR18021] (ab188224)

Immunohistochemical analysis of paraffin-embedded Mouse lung cancer tissue labeling p21 with ab188224 at 1/1000 dilution (0.517 µg/ml) followed by a ready to use LeicaDS9800 (Bond™ Polymer Refine Detection). Positive staining on mouse lung cancer. The section was incubated with ab188224 for 30 mins at room temperature. The section was counterstained with Hematoxylin. The immunostaining was performed on a Leica Biosystems BOND® RX instrument. Secondary antibody only control: Secondary antibody is a ready to use LeicaDS9800 (Bond™ Polymer Refine Detection). Heat mediated antigen retrieval was performed with Tris-EDTA buffer (pH 9.0, Epitope Retrieval Solution2) for 20 mins.



Immunocytochemistry/ Immunofluorescence - Anti-p21 antibody [EPR18021] (ab188224)

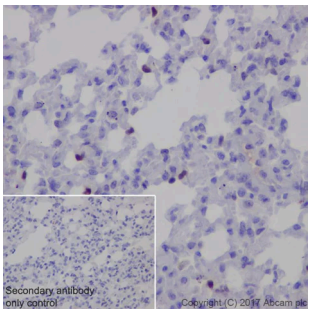
P21 Immunocytochemistry/ Immunofluorescence staining using rabbit Anti-p21 antibody

Immunofluorescent analysis of 4% paraformaldehyde-fixed, 0.1% Triton X-100 permeabilized NIH/3T3 (Mouse embryonic fibroblast cell line) cells labeling p21 with ab188224 at 1/500 dilution, followed by Goat anti-rabbit IgG (Alexa Fluor® 488) (ab150077) secondary antibody at 1/1000 dilution (green).
Confocal image showing nuclear staining on NIH/3T3 cells.

The nuclear counterstain is DAPI (blue).

Tubulin is detected with ab195889 (Anti-alpha Tubulin antibody [DM1A] - Microtubule Marker (Alexa Fluor® 594)) at 1/200 dilution (red).

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



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-p21 antibody [EPR18021] (ab188224)

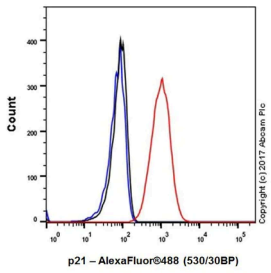
P21 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using rabbit Anti-p21 antibody

Immunohistochemical analysis of paraffin-embedded mouse lung tissue labeling p21 with ab188224 at 1/1000 dilution, followed by Goat Anti-Rabbit IgG H&L (HRP) (ab97051) at 1/500 dilution.
Sporadic nuclear staining on mouse lung is observed (PMID: 25333671).

Counter stained with Hematoxylin.

Secondary antibody only control: Used PBS instead of primary antibody, secondary antibody is Goat Anti-Rabbit IgG H&L (HRP) (ab97051) at 1/500 dilution.

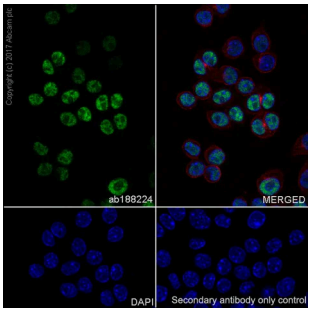
Perform heat mediated antigen retrieval with Tris/EDTA buffer pH 9.0 before commencing with IHC staining protocol.



Flow Cytometry (Intracellular) - Anti-p21 antibody [EPR18021] (ab188224)

P21 Flow Cytometry (Intracellular) staining using rabbit Anti-p21 antibody

Intracellular flow cytometric analysis of 4% paraformaldehyde-fixed RAW 264.7 (Mouse macrophage cell line transformed with Abelson murine leukemia virus) cells labeling p21with ab188224 at 1/50 dilution (red) compared with a rabbit monoclonal IgG isotype control (ab172730; black) and an unlabeled control (cells without incubation with primary antibody and secondary antibody; blue). Goat anti rabbit IgG (Alexa Fluor® 488) (ab150077) at 1/2000 dilution was used as the secondary antibody.



Immunocytochemistry/ Immunofluorescence - Anti-p21 antibody [EPR18021] (ab188224)

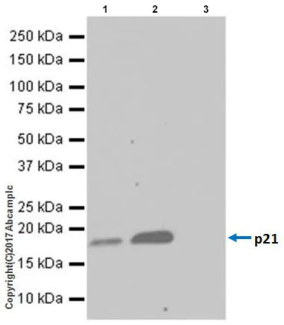
P21 Immunocytochemistry/ Immunofluorescence staining using rabbit Anti-p21 antibody

Immunofluorescent analysis of 4% paraformaldehyde-fixed, 0.1% Triton X-100 permeabilized RAW 264.7 (Mouse macrophage cell line transformed with Abelson murine leukemia virus) cells labeling p21 with ab188224 at 1/500 dilution, followed by Goat anti-rabbit IgG (Alexa Fluor® 488) (ab150077) secondary antibody at 1/1000 dilution (green).
Confocal image showing nuclear staining on RAW264.7 cells.

The nuclear counterstain is DAPI (blue).

Tubulin is detected with ab195889 (Anti-alpha Tubulin antibody [DM1A] - Microtubule Marker (Alexa Fluor® 594)) at 1/200 dilution (red).

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



Immunoprecipitation - Anti-p21 antibody [EPR18021] (ab188224)

p21 was immunoprecipitated from 0.35 mg of NIH/3T3 (Mouse embryonic fibroblast cell line) whole cell lysate with ab188224 at 1/30 dilution.
Western blot was performed from the immunoprecipitate using ab188224 at 1/500 dilution.

VeriBlot for IP Detection Reagent (HRP) (ab131366), was used for detection at 1/1000 dilution.

Lane 1: NIH/3T3 whole cell lysate 10 µg (Input).

Lane 2: ab188224 IP in NIH/3T3 whole cell lysate.

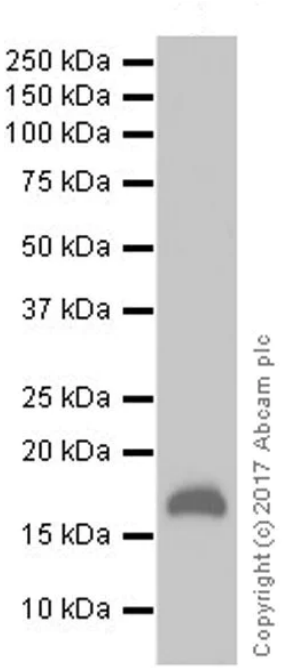
Lane 3: Rabbit monoclonal IgG (ab172730) instead of ab188224 in NIH/3T3 whole cell lysate.

Blocking and dilution buffer and concentration: 5% NFDM/TBST.

Exposure time: 10 seconds.

All lanes:
Immunoprecipitation - Anti-p21 antibody [EPR18021] (ab188224)

Predicted band size: 18 kDa



Western blot - Anti-p21 antibody [EPR18021] (ab188224)

P21 Western blot staining of RAW264.7 (Mouse macrophage cell line transformed with Abelson murine leukemia virus) whole cell lysate using rabbit Anti-p21 antibody

Blocking/Dilution buffer: 5% NFDM/TBST.
All lanes:
Western blot - Anti-p21 antibody [EPR18021] (ab188224) at 1/1000 dilution

All lanes:
RAW264.7 (Mouse macrophage cell line transformed with Abelson murine leukemia virus) whole cell lysate at 10 µg

Secondary

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

Predicted band size: 18 kDa

Observed band size: 18 kDa

Exposure time: 8s

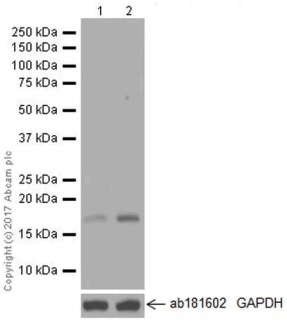


Western blot - Anti-p21 antibody [EPR18021] (ab188224)

P21 Western blot staining using rabbit Anti-p21 antibody

Different batches of ab188224 were tested on RAW 264.7 (Mouse Abelson murine leukemia virus-induced tumor macrophage) lysate at 0.1 µg/ml. 15 µg of lysate was loaded in each lane. Bands observed at 18 kDa.
All lanes:
Western blot - Anti-p21 antibody [EPR18021] (ab188224)

Predicted band size: 18 kDa



Western blot - Anti-p21 antibody [EPR18021] (ab188224)

P21 Western blot staining using rabbit Anti-p21 antibody

Blocking/Dilution buffer: 5% NFDM/TBST.
The expression level of p21 protein can be induced using staurosporine (protein kinase C inhibitor) (PMID:7677742).

All lanes:
Western blot - Anti-p21 antibody [EPR18021] (ab188224) at 1/1000 dilution

Lane 1:
Untreated NIH/3T3 (Mouse embryonic fibroblast cell line) whole cell lysate at 20 µg

Lane 2:
NIH/3T3 (Mouse embryonic fibroblast cell line) treated with 1µM staurosporine for 2hrs, whole cell lysate at 20 µg

Secondary

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

Predicted band size: 18 kDa

Observed band size: 18 kDa

Exposure time: 3min

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