abcam

ab52587

Anti-PD-1/CD279 antibody [NAT105]

Anti-PD-1/CD279 antibody [NAT105] (ab52587) is a mouse monoclonal antibody detecting PD-1/CD279 in **Western Blot, Flow Cytometry, IHC-P, IHC-Fr, ICC/IF**. Suitable for **Human**.

- Over 280 publications
- Trusted since 2007

Recombinant

Key facts

Isotype	IgG1
Host species	Mouse
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	NAT105
Purification technique	Affinity purification Protein A
Light chain type	kappa
Concentration	1.068 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
Notes	Perform heat-mediated antigen retrieval before commencing with IHC staining protocol.

Flow Cyt

Tested

Species	Human
Dilution info	1/1000
Notes	-

WB

Tested

Species	Human
Dilution info	1/1000
Notes	-

ICC/IF

Tested

Species	Human
Dilution info	1/100
Notes	We recommend Goat Anti-Mouse IgG H&L (Alexa Fluor® 488) (ab150117) secondary antibody.

IHC-Fr

Tested

Species	Human
Dilution info	1/10000
Notes	Recommend testing higher antibody concentrations (0.5-1.0 µg/mL) to achieve optimal staining in the IHC-Fr-IF application.

Target data

See full target information PD-1/CD279

Function	Inhibitory receptor on antigen activated T-cells that plays a critical role in induction and maintenance of immune tolerance to self (PubMed:21276005, PubMed:31754127, PubMed:32184441, PubMed:37208329). Delivers inhibitory signals upon binding to ligands CD274/PDCD1L1 and CD273/PDCD1LG2 (PubMed:21276005, PubMed:26602187). Following T-cell receptor (TCR) engagement, PDCD1 associates with TCR-CD3 in the immunological synapse and directly inhibits T-cell activation (PubMed:32184441). Suppresses T-cell activation through the recruitment of PTPN11/SHP-2: following ligand-binding, PDCD1 is phosphorylated within the ITSM motif, leading to the recruitment of the protein tyrosine phosphatase PTPN11/SHP-2 that mediates dephosphorylation of key TCR proximal signaling molecules, such as ZAP70, PRKCQ/PKCtheta and CD247/CD3zeta (PubMed:32184441). The PDCD1-mediated inhibitory pathway is exploited by tumors to attenuate anti-tumor immunity and escape destruction by the immune system, thereby facilitating tumor survival (PubMed:28951311). The interaction with CD274/PDCD1L1 inhibits cytotoxic T lymphocytes (CTLs) effector function (PubMed:28951311). The blockage of the PDCD1-mediated pathway results in the reversal of the exhausted T-cell phenotype and the normalization of the anti-tumor response, providing a rationale for cancer immunotherapy (PubMed:22658127, PubMed:25034862, PubMed:25399552).

Storage

Shipped at conditions	Blue Ice
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-PD1 antibody [NAT105] (ab52587) is a mouse recombinant monoclonal antibody and is validated for use in Flow Cyt, ICC/IF, IHC-Fr, IHC-P and WB.

Anti-PD1 antibody [NAT105] (ab52587) was first used in a scientific publication in 2007 and has been cited over 282 times in peer reviewed journals. It's performance in IHC in human samples is trusted by the scientific community.

Abcam's high quality manufacturing and validation processes ensure Anti-PD1 antibody [NAT105] (ab52587) has high sensitivity and specificity alongside high lot-to-lot consistency and reproducibility.

Anti-PD1 antibody [NAT105] (ab52587) has 8 independent reviews from customers.

Anti-PD1 antibody [NAT105] (ab52587) specifically detects PD1 (UniProt ID: Q15116; Molecular weight: 29kDa) and is sold in a convenient trial size to enable initial testing (20 µg) and larger sizes for subsequent scaling up experiments (100 ug and 1 mg).

Conjugation-ready, carrier free format available for antibody clone NAT105 - ab201811.

Antibody clone NAT105 is also available pre-conjugated to a variety of labels for your convenience - Alexa Fluor® 488, Alexa Fluor® 647, PE, Alexa Fluor® 647, Alexa Fluor® 555 (ab220300, ab220301, ab220302, ab279695, ab280864).

PD-1 is an immune checkpoint receptor that, when engaged by its ligands PD-L1 or PD-L2, inhibits T-cell activity, allowing tumors to evade immune detection. Blocking the PD-1 pathway with immune checkpoint inhibitors reactivates T-cells, enhancing the immune system's ability to target and destroy cancer cells.

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	Programmed cell death protein 1 commonly known as PD-1 or PDCD1 is an immune checkpoint receptor with a molecular mass of approximately 55 kDa. This protein is primarily expressed on the surface of activated T cells B cells and myeloid cells within the immune system. PD-1 plays a mechanical role in modulating immune responses by binding to its ligands PD-L1 and PD-L2 which are expressed on other immune cells and in various other tissues. The engagement of PD-1 with its ligands transmits an inhibitory signal that reduces the proliferation and activity of T cells.
Biological function summary	PD-1 serves as a critical immune checkpoint that helps maintain self-tolerance and prevent autoimmunity. PD-1 does not function as part of a multi-protein complex but independently regulates the immune response. By delivering inhibitory signals upon ligand binding PD-1 limits the overactivation of the immune system reducing the likelihood of tissue damage during inflammatory responses. The modulation of T cell activity by PD-1 contributes to a balanced immune system ensuring that the body targets pathogens effectively without harming itself.
Pathways	

	PD-1 interacts with key immune-regulatory pathways including the PI3K-Akt and Ras-MAPK pathways. These pathways are important for cell survival growth and metabolism. The interaction of PD-1 with the PI3K-Akt pathway involves proteins such as SHP-2 which dephosphorylates signaling intermediates leading to reduced T cell receptor signaling. PD-1's role in these pathways demonstrates its influence on immune cell function particularly in regulating the intensity and duration of immune responses.
Associated diseases and disorders	The PD-1 pathway plays an important role in cancer and autoimmune diseases. Tumors often exploit the PD-1 pathway to evade immune surveillance leading to cancer progression. In such cases blocking PD-1 with inhibitors like anti-PD-1 antibodies (e.g. EH12.2H7 and chimeric antibodies) can re-activate T cells against cancer cells. Conversely in autoimmune diseases heightened PD-1 expression or activity could help in moderating aberrant immune responses where the immune system attacks the body's own tissues. The PD-1 pathway interacting with proteins such as CTLA-4 in cancer and autoimmune contexts represents a target for therapeutics aiming to modulate the immune system to improve disease outcomes.

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

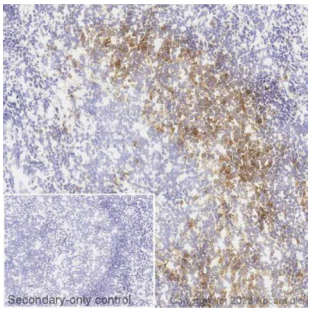
We do not recommend this combination. It is not covered by our product promise.

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.

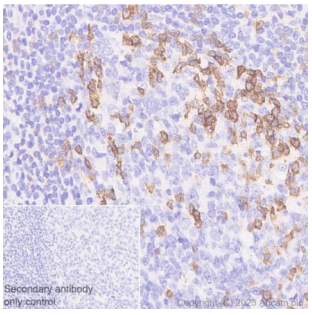
9 product images



Immunohistochemistry (Frozen sections) - Anti-PD-1/CD279 antibody [NAT105] (ab52587)

PD-1/CD279 Immunohistochemistry (Frozen sections) staining of Human tonsil tissue using mouse Anti-PD-1/CD279 antibody

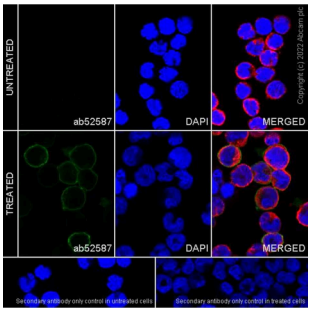
Immunohistochemical analysis of permeabilized frozen Human tonsil tissue labeling PD1 with ab52587 at 1/10000 dilution, followed by LeicaDS9800 (Bond™ PolymerRefine Detection). Counterstained with hematoxylin. The immunostaining was performed on a Leica Biosystems BOND® RX instrument.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-PD-1/CD279 antibody [NAT105] (ab52587)

PD-1/CD279 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining of Human tonsil tissue using mouse Anti-PD-1/CD279 antibody

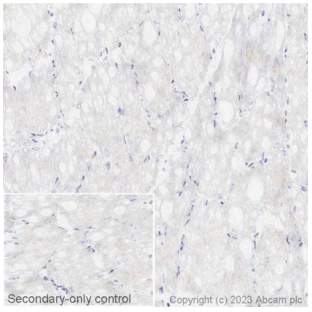
Immunohistochemical analysis of paraffin-embedded Human tonsil tissue labeling PD1 with ab52587 at 1/100 dilution, followed by a ready to use LeicaDS9800 (Bond™ Polymer Refine Detection). The immunostaining was performed on a Leica Biosystems BOND® RX instrument. Counterstained with Hematoxylin. Heat mediated antigen retrieval was performed with Citrate buffer (pH 6.0, Epitope Retrieval Solution 1) for 20 mins.



Immunocytochemistry/ Immunofluorescence - Anti-PD-1/CD279 antibody [NAT105] (ab52587)

PD-1/CD279 Immunocytochemistry/ Immunofluorescence staining of MOLT-4 treated with 10ng/ml PMA and 500ng/ml Ionomycin using mouse Anti-PD-1/CD279 antibody

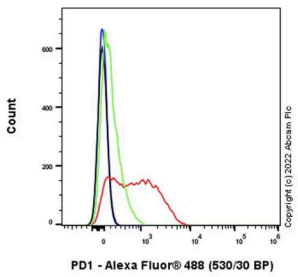
Immunofluorescent analysis of 4% Paraformaldehyde-fixed, 0.1% TritonX-100 permeabilized MOLT-4 cells labelling PD1 with ab52587 at 1/100 dilution, followed by Goat Anti-Mouse IgG H&L (Alexa Fluor® 488) preadsorbed (ab150117) at 1/1000 dilution at RT for 45 min. Recombinant Alexa Fluor® 594 Anti-beta Tubulin antibody [EPR16774] (ab206369) was used as a counterstain at 1/50 dilution and was co-incubated with ab52587 overnight at 4° C. Nucleus were visualized using DAPI. Confocal image showing membranous staining in MOLT-4 cells treated with 500 ng/ml Ionomycin and 10 ng/ml Phorbol-12-myristate-13-acetate (PMA) for 24 hours, and no staining in MOLT-4 cells.



Immunohistochemistry (Frozen sections) - Anti-PD-1/CD279 antibody [NAT105] (ab52587)

PD-1/CD279 Immunohistochemistry (Frozen sections) staining of Human cardiac muscle tissue using mouse Anti-PD-1/CD279 antibody

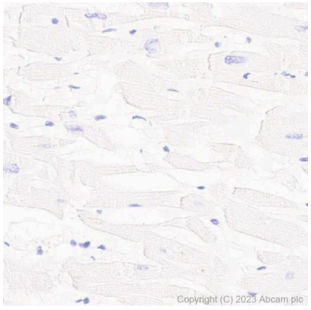
Immunohistochemical analysis of permeabilized frozen Human cardiac muslce tissue labeling PD1 with ab52587 at 1/10000 dilution, followed by LeicaDS9800 (Bond™ PolymerRefine Detection). No staining on human cardiac muscle. Counterstained with hematoxylin. The immunostaining was performed on a Leica Biosystems BOND® RX instrument.



Flow Cytometry - Anti-PD-1/CD279 antibody [NAT105] (ab52587)

PD-1/CD279 Flow Cytometry staining of MOLT-4 treated with 10ng/ml PMA and 500ng/ml Ionomycin using mouse Anti-PD-1/CD279 antibody

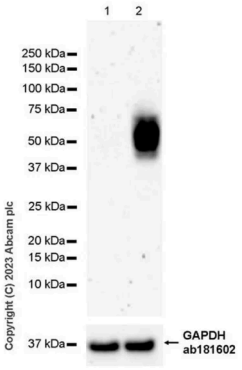
Cells were fixed with 100µl 4% PFA for 10 min at RT, then permeabilized with 100µl 90% methanol for 30 min (-20° C) followed by blocking with 10% goat serum for 1h at room temperature. Incubate ab52587 for 30 min at room temperature (RT) and then incubate Goat anti-Mouse IgG (Alexa Fluor® 488, ab150113) for 30 min at room temperature. Positive staining on MOLT-4 treated with 10ng/ml PMA and 500ng/ml Ionomycin for 24h, but weak staining on untreated MOLT-4.



Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-PD-1/CD279 antibody [NAT105] (ab52587)

PD-1/CD279 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining of Human cardiac muscle tissue using mouse Anti-PD-1/CD279 antibody

Immunohistochemical analysis of paraffin-embedded Human cardiac muscle tissue labeling PD1 with ab52587 at 1/100 dilution, followed by a ready to use LeicaDS9800 (Bond™ Polymer Refine Detection). No staining on human cardiac muscle. The immunostaining was performed on a Leica Biosystems BOND® RX instrument. Counterstained with Hematoxylin. Heat mediated antigen retrieval was performed with Citrate buffer (pH 6.0, Epitope Retrieval Solution 1) for 20 mins.



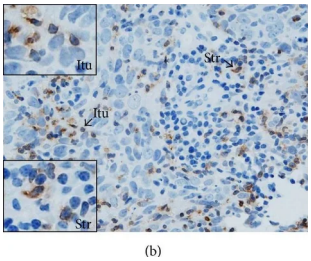
Western blot - Anti-PD-1/CD279 antibody [NAT105] (ab52587)

PD-1/CD279 Western blot staining using mouse Anti-PD-1/CD279 antibody

Blocking and diluting buffer and concentration: 5% NFDM/TBST.
All lanes:
Western blot - Anti-PD-1/CD279 antibody [NAT105] (ab52587) at 1/1000 dilution

Lane 1:
Untreated MOLT-4 (human lymphoblastic leukemia T lymphoblast) whole cell lysate at 20 µg

Lane 2:
MOLT-4 treated with 500ng/ml Ionomycin and 10ng/ml Phorbol-12-myristate-13-acetate (PMA) for 24 hours, whole cell lysate at 20 µg



(b)

Image collected and cropped by CiteAb under a CC-BY license from the publication

Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) - Anti-PD-1/CD279 antibody [NAT105] (ab52587)

PD-1/CD279 Immunohistochemistry (Formalin/PFA-fixed paraffin-embedded sections) staining using mouse Anti-PD-1/CD279 antibody

PD1 Immunohistochemistry using Anti-PD1 antibody [NAT105] ab52587. Publication image and figure legend from Kaewkangsadan, V., Verma, C., et al. 2016, J Immunol Res, PubMed 27777963.

PD-1+ T cells in the sections of LLABCs, using IHC staining, at 400x magnification. Briefly, heat-mediated antigen retrieval was performed using citrate buffer, pH 6 (20 mins). The sections were then incubated with MAbs to PD-1 (Abcam, ab52587) at a 1 : 100 dilution for 30 mins at RT. Polymeric HRP-linker antibody conjugate was used as secondary antibody. DAB chromogen was used to visualize the staining. The sections were counterstained with haematoxylin. (a) Low level of PD-1+ T cell infiltration; (b) high level of PD-1+ T cell infiltration. The average number of brown

membrane-stained cells, regardless of intensity, in contact with tumour cells or within tumour cell nests (Itu: intratumoural) and in the interstitial stroma (Str: stromal) per HPF was counted.

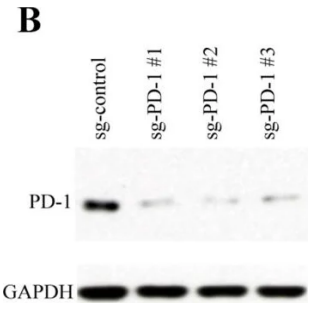


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Western blot - Anti-PD-1/CD279 antibody [NAT105] (ab52587)

PD-1/CD279 Western blot staining using mouse Anti-PD-1/CD279 antibody

PD1 western blot using Anti-PD1 antibody [NAT105] ab52587. Publication image and figure legend from Zhao, Z., Shi, L., et al., 2018, Oncotarget, PubMed 29435173.

CTLs isolation and PD-1 knockout(A) The percentage of CD3+/CD8+ cells (CTLs) reached 95% after negative selection. (B) The CTLs were transduced with lentivirus co-expressing Cas9 and each of the indicated guide RNA. The expression of PD-1 guide RNA reduced the PD-1 expression in the transduced cells.

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