abcam

ab278604

Anti-Cleaved PARP1 antibody [PARP-H8]

Lab Essentials | Recombinant | 20ul selling size

Key facts

Isotype	IgG
Host species	Rabbit
Storage buffer	Preservative: 0.02% Sodium azide Constituents: PBS, 50% Glycerol (glycerin, glycerine), 0.1% BSA
Form	Liquid
Clonality	Monoclonal
Immunogen	Synthetic Peptide within Human PARP1. The exact immunogen used to generate this antibody is proprietary information. Database link P09874
Clone number	PARP-H8
Purification technique	Affinity purification Protein A/G
Light chain type	kappa
Concentration	0.5 mg/mL The concentration of this product may be batch-dependent Batch concentration finder →

Reactivity data

Flow Cyt

Tested

Species	Human
Dilution info	0.001-1 µg/mL

Notes	-

WB

Tested

Species	Human
Dilution info	0.001-1 µg/mL
Notes	-

Target data

See full target information PARP1

Function

Poly-ADP-ribosyltransferase that mediates poly-ADP-ribosylation of proteins and plays a key role in DNA repair (PubMed:17177976, PubMed:18055453, PubMed:18172500, PubMed:19344625, PubMed:19661379, PubMed:20388712, PubMed:21680843, PubMed:22582261, PubMed:23230272, PubMed:25043379, PubMed:26344098, PubMed:26626479, PubMed:26626480, PubMed:30104678, PubMed:31796734, PubMed:32028527, PubMed:32241924, PubMed:32358582, PubMed:33186521, PubMed:34465625, PubMed:34737271). Mediates glutamate, aspartate, serine, histidine or tyrosine ADP-ribosylation of proteins: the ADP-D-ribosyl group of NAD(+) is transferred to the acceptor carboxyl group of target residues and further ADP-ribosyl groups are transferred to the 2'-position of the terminal adenosine moiety, building up a polymer with an average chain length of 20-30 units (PubMed:19764761, PubMed:25043379, PubMed:28190768, PubMed:29954836, PubMed:35393539, PubMed:7852410, PubMed:9315851). Serine ADP-ribosylation of proteins constitutes the primary form of ADP-ribosylation of proteins in response to DNA damage (PubMed:33186521, PubMed:34874266). Specificity for the different amino acids is conferred by interacting factors, such as HPF1 and NMNAT1 (PubMed:28190768, PubMed:29954836, PubMed:32028527, PubMed:33186521, PubMed:33589610, PubMed:34625544, PubMed:34874266). Following interaction with HPF1, catalyzes serine ADP-ribosylation of target proteins; HPF1 confers serine specificity by completing the PARP1 active site (PubMed:28190768, PubMed:29954836, PubMed:32028527, PubMed:33186521, PubMed:33589610, PubMed:34625544, PubMed:34874266). Also catalyzes tyrosine ADP-ribosylation of target proteins following interaction with HPF1 (PubMed:29954836, PubMed:30257210). Following interaction with NMNAT1, catalyzes glutamate and aspartate ADP-ribosylation of target proteins; NMNAT1 confers glutamate and aspartate specificity (By similarity). PARP1 initiates the repair of DNA breaks: recognizes and binds DNA breaks within chromatin and recruits HPF1, licensing serine ADP-ribosylation of target proteins, such as histones (H2BS6ADPr and H3S10ADPr), thereby promoting decompaction of chromatin and the recruitment of repair factors leading to the reparation of DNA strand breaks (PubMed:17177976, PubMed:18172500, PubMed:19344625, PubMed:19661379, PubMed:23230272, PubMed:27067600, PubMed:34465625, PubMed:34874266). HPF1 initiates serine ADP-ribosylation but restricts the polymerase activity of PARP1 in order to limit the length of poly-ADP-

ribose chains (PubMed:33683197, PubMed:34732825, PubMed:34795260). In addition to base excision repair (BER) pathway, also involved in double-strand breaks (DSBs) repair: together with TIMELESS, accumulates at DNA damage sites and promotes homologous recombination repair by mediating poly-ADP-ribosylation (PubMed:26344098, PubMed:30356214). Mediates the poly-ADP-ribosylation of a number of proteins, including itself, APLF, CHFR, RPA1 and NFAT5 (PubMed:17396150, PubMed:19764761, PubMed:24906880, PubMed:34049076). In addition to proteins, also able to ADP-ribosylate DNA: catalyzes ADP-ribosylation of DNA strand break termini containing terminal phosphates and a 2'-OH group in single- and double-stranded DNA, respectively (PubMed:27471034). Required for PARP9 and DTX3L recruitment to DNA damage sites (PubMed:23230272). PARP1-dependent PARP9-DTX3L-mediated ubiquitination promotes the rapid and specific recruitment of 53BP1/TP53BP1, UIMC1/RAP80, and BRCA1 to DNA damage sites (PubMed:23230272). PARP1-mediated DNA repair in neurons plays a role in sleep: senses DNA damage in neurons and promotes sleep, facilitating efficient DNA repair (By similarity). In addition to DNA repair, also involved in other processes, such as transcription regulation, programmed cell death, membrane repair, adipogenesis and innate immunity (PubMed:15607977, PubMed:17177976, PubMed:19344625, PubMed:27256882, PubMed:32315358, PubMed:32844745, PubMed:35124853, PubMed:35393539, PubMed:35460603). Acts as a repressor of transcription: binds to nucleosomes and modulates chromatin structure in a manner similar to histone H1, thereby altering RNA polymerase II (PubMed:15607977, PubMed:22464733). Acts both as a positive and negative regulator of transcription elongation, depending on the context (PubMed:27256882, PubMed:35393539). Acts as a positive regulator of transcription elongation by mediating poly-ADP-ribosylation of NELFE, preventing RNA-binding activity of NELFE and relieving transcription pausing (PubMed:27256882). Acts as a negative regulator of transcription elongation in response to DNA damage by catalyzing poly-ADP-ribosylation of CCNT1, disrupting the phase separation activity of CCNT1 and subsequent activation of CDK9 (PubMed:35393539). Involved in replication fork progression following interaction with CARM1: mediates poly-ADP-ribosylation at replication forks, slowing fork progression (PubMed:33412112). Poly-ADP-ribose chains generated by PARP1 also play a role in poly-ADP-ribose-dependent cell death, a process named parthanatos (By similarity). Also acts as a negative regulator of the cGAS-STING pathway (PubMed:32315358, PubMed:32844745, PubMed:35460603). Acts by mediating poly-ADP-ribosylation of CGAS: PARP1 translocates into the cytosol following phosphorylation by PRKDC and catalyzes poly-ADP-ribosylation and inactivation of CGAS (PubMed:35460603). Acts as a negative regulator of adipogenesis: catalyzes poly-ADP-ribosylation of histone H2B on 'Glu-35' (H2BE35ADPr) following interaction with NMNAT1, inhibiting phosphorylation of H2B at 'Ser-36' (H2BS36ph), thereby blocking expression of pro-adipogenetic genes (By similarity). Involved in the synthesis of ATP in the nucleus, together with NMNAT1, PARG and NUDT5 (PubMed:27257257). Nuclear ATP generation is required for extensive chromatin remodeling events that are energy-consuming (PubMed:27257257). Poly [ADP-ribose] polymerase 1, processed C-terminus. Promotes AIFM1-mediated apoptosis (PubMed:33168626). This form, which translocates into the cytoplasm following cleavage by caspase-3 (CASP3) and caspase-7 (CASP7) in response to apoptosis, is auto-poly-ADP-ribosylated and serves as a poly-ADP-ribose carrier to induce AIFM1-mediated apoptosis (PubMed:33168626). Poly [ADP-ribose] polymerase 1, processed N-terminus. This cleavage form irreversibly binds to DNA breaks and interferes with DNA repair, promoting DNA damage-induced apoptosis.

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

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	Cleaved PARP1 also known as cPARP is a fragment of the PARP1 protein an important DNA repair enzyme. The full PARP1 protein has a molecular weight of approximately 116 kDa but after cleavage during apoptosis the cleaved PARP1 fragments typically have a molecular weight of around 89 kDa and 24 kDa. PARP1 is expressed abundantly in the cell nucleus where it plays important roles in maintaining genomic integrity. The cleavage of PARP1 is a common marker for cell apoptosis pointing towards its breakdown in response to cellular stress.
Biological function summary	The enzymatic function of PARP1 involves the transfer of ADP-ribose units from NAD+ to target proteins a process known as ADP-ribosylation. PARP1 operates as a part of the base excision repair complex essential in DNA repair processes. The cleaved form of PARP1 no longer facilitates DNA repair marking a shift towards apoptosis. When PARP1 is cleaved it indicates caspase activity implying cells are undergoing programmed cell death.

Pathways	Cleaved PARP1 is deeply involved in the apoptosis and DNA damage response pathways. In the apoptosis pathway PARP1 interacts with key proteins like caspase-3 which cleaves PARP during apoptosis. In the DNA damage response PARP1 collaborates with proteins such as XRCC1 facilitating the base excision repair pathway important for fixing single-strand DNA breaks. These pathways highlight the dual role of PARP1 in promoting cell survival through repair and cell death via apoptosis.
Associated diseases and disorders	Cleaved PARP1 serves as an important marker in cancer and neurodegenerative diseases. In cancer research elevated levels of cleaved PARP1 suggest increased rates of apoptosis in response to anti-cancer therapies linking it to tumor suppression efforts. In neurodegenerative diseases excessive activation and cleavage of PARP1 can result in cell death exacerbating conditions like Alzheimer's disease. Through these contexts cleaved PARP1 connects to other therapeutic targets such as caspase proteins in cancer and to potential PARP inhibitors in neurodegenerative 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

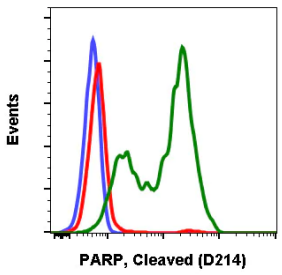
We do not recommend this combination. It is not covered by our product promise.

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:
Terms & Conditions.

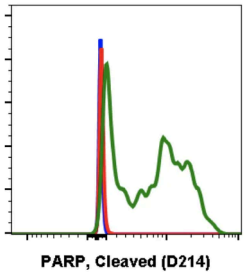
4 product images



Flow Cytometry - Anti-Cleaved PARP1 antibody [PARP-H8] (ab278604)

Cleaved PARP1 Flow Cytometry staining using rabbit Anti-Cleaved PARP1 antibody

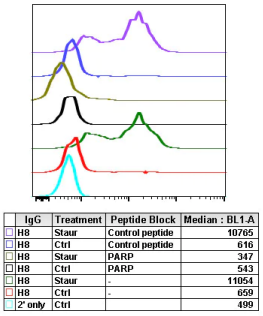
Flow cytometric analysis of SK.N.MC cells unstained untreated cells as negative control (blue) or stained untreated (red) or treated with staurosporine (green) using ab278604 at 0.1 µg/mL.



Flow Cytometry - Anti-Cleaved PARP1 antibody [PARP-H8] (ab278604)

Cleaved PARP1 Flow Cytometry staining using rabbit Anti-Cleaved PARP1 antibody

Flow cytometric analysis of SK.N.MC cells secondary antibody only negative control (blue) or untreated (red) or treated with staurosporine (green) using ab278604 at 0.1 µg/mL.

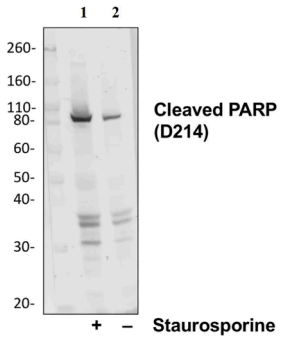


IgG	Treatment	Peptide Block	Median : BL1-A
H8	Staur	Control peptide	10765
H8	Ctrl	Control peptide	616
H8	Staur	PARP	347
H8	Ctrl	PARP	543
H8	Staur	-	11054
H8	Ctrl	-	659
2° only	Ctrl		499

Flow Cytometry - Anti-Cleaved PARP1 antibody [PARP-H8] (ab278604)

Cleaved PARP1 Flow Cytometry staining using rabbit Anti-Cleaved PARP1 antibody

Peptide blocking flow cytometric analysis of SK.N.MC cells secondary antibody only negative control (light blue) or untreated (red) or treated with staurosporine (green) or untreated and blocked with immunogen peptide (black) or treated and blocked with immunogen peptide (gold) or untreated and blocked with irrelevant peptide (dark blue) or treated and blocked with irrelevant peptide (purple) using ab278604 at 0.1 µg/mL.



Western blot - Anti-Cleaved PARP1 antibody [PARP-H8] (ab278604)

All lanes:
Western blot - Anti-Cleaved PARP1 antibody [PARP-H8] (ab278604) at 0.001 µg/mL

Lane 1:
HeLa cell extract treated with staurosporine

Lane 2:
HeLa cell extract untreated

Predicted band size: 113 kDa

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