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PINK1 Antibody

Catalog # ASC11814

Product Information

Application	WB, E
Primary Accession	Q9BXM7
Other Accession	NP_115785, 14165272
Reactivity	Human, Mouse, Rat
Host	Rabbit
Clonality	Polyclonal
Isotype	IgG
Calculated MW	62769
Concentration (mg/ml)	1 mg/mL
Conjugate	Unconjugated
Application Notes	PINK1 antibody can be used for detection of PINK1 by Western blot at 1 - 2 g/ml.

Additional Information

Gene ID	65018
Other Names	Serine/threonine-protein kinase PINK1, mitochondrial, 2.7.11.1, BRPK, PTEN-induced putative kinase protein 1, PINK1
Target/Specificity	PINK1; PINK1 antibody is human, mouse and rat reactive. At least two isoforms are known to exist; this antibody will only detect the longer isoform. PINK1 antibody will detect the cleaved and uncleaved form of PINK1.
Reconstitution & Storage	PINK1 antibody can be stored at 4℃ for three months and -20℃, stable for up to one year.
Precautions	PINK1 Antibody is for research use only and not for use in diagnostic or therapeutic procedures.

Protein Information

Name	PINK1
Function	Serine/threonine-protein kinase which acts as a sensor of mitochondrial damage and protects against mitochondrial dysfunction during cellular stress. It phosphorylates mitochondrial proteins to coordinate mitochondrial quality control mechanisms that remove and replace dysfunctional mitochondrial components (PubMed:14607334, PubMed:15087508, PubMed:18443288, PubMed:18957282, PubMed:19229105, PubMed:19966284, PubMed:20404107, PubMed:20547144, PubMed:20798600, PubMed:22396657, PubMed:23620051, PubMed:23754282, PubMed:23933751, PubMed:24660806, PubMed:24751536, PubMed:24784582, PubMed:24896179, PubMed:24898855,

	PubMed:25527291, PubMed:32484300). Depending on the severity of mitochondrial damage, activity ranges from preventing apoptosis and stimulating mitochondrial biogenesis to eliminating severely damaged mitochondria via PINK1-PRKN-dependent mitophagy (PubMed:14607334, PubMed:15087508, PubMed:18443288, PubMed:19966284, PubMed:20404107, PubMed:20798600, PubMed:22396657, PubMed:23620051, PubMed:23933751, PubMed:24898855, PubMed:32047033, PubMed:32484300). When cellular stress results in irreversible mitochondrial damage, PINK1 accumulates at the outer mitochondrial membrane (OMM) where it phosphorylates pre-existing polyubiquitin chains at 'Ser-65', recruits PRKN from the cytosol to the OMM and activates PRKN by phosphorylation at 'Ser-65'; activated PRKN then ubiquinates VDAC1 and other OMM proteins to initiate mitophagy (PubMed:14607334, PubMed:15087508, PubMed:19966284, PubMed:20404107, PubMed:20798600, PubMed:23754282, PubMed:23933751, PubMed:24660806, PubMed:24751536, PubMed:24784582, PubMed:25474007, PubMed:25527291, PubMed:32047033). The PINK1-PRKN pathway also promotes fission of damaged mitochondria through phosphorylation and PRKN-dependent degradation of mitochondrial proteins involved in fission such as MFN2 (PubMed:18443288, PubMed:23620051, PubMed:24898855). This prevents the refusion of unhealthy mitochondria with the mitochondrial network or initiates mitochondrial fragmentation facilitating their later engulfment by autophagosomes (PubMed:18443288, PubMed:23620051). Also promotes mitochondrial fission independently of PRKN and ATG7-mediated mitophagy, via the phosphorylation and activation of DNM1L (PubMed:18443288, PubMed:32484300). Regulates motility of damaged mitochondria by promoting the ubiquitination and subsequent degradation of MIRO1 and MIRO2; in motor neurons, this likely inhibits mitochondrial intracellular anterograde transport along the axons which probably increases the chance of the mitochondria undergoing mitophagy in the soma (PubMed:22396657). Required for ubiquinone reduction by mitochondrial complex I by mediating phosphorylation of complex I subunit NDUFA10 (By similarity). Phosphorylates LETM1, positively regulating its mitochondrial calcium transport activity (PubMed:29123128).
Cellular Location	Mitochondrion outer membrane; Single-pass membrane protein. Mitochondrion inner membrane {ECO:0000250|UniProtKB:Q99MQ3}; Single-pass membrane protein. Cytoplasm, cytosol. Note=Localizes mostly in mitochondrion and the two smaller proteolytic processed fragments localize mainly in cytosol (PubMed:19229105). Upon mitochondrial membrane depolarization following damage, PINK1 import into the mitochondria is arrested, which induces its accumulation in the outer mitochondrial membrane, where it acquires kinase activity (PubMed:18957282)
Tissue Location	Highly expressed in heart, skeletal muscle and testis, and at lower levels in brain, placenta, liver, kidney, pancreas, prostate, ovary and small intestine. Present in the embryonic testis from an early stage of development

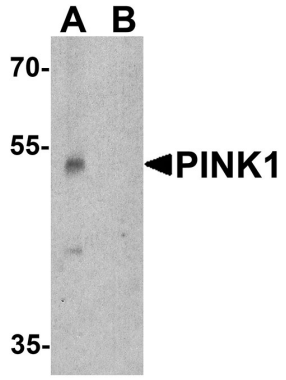
Background

The PTEN-induced putative kinase 1 (PINK1) is a serine/threonine protein kinase that localizes to mitochondria and is thought to protect cells from stress-induced mitochondrial dysfunction (reviewed in 1). PINK1 recruits the E3 ubiquitin ligase Parkin to mitochondria to initiate mitophagy, an autophagic process that clears damaged mitochondria within a cell (2). PINK1 is cleaved by the mitochondrial protease PARL (3). Mutations in this gene cause one form of autosomal recessive early-onset Parkinson disease (4).

References

Matsuda S, Kitagishi Y, and Kobayashi M. Function and characteristics of PINK1 in mitochondria. Oxid. Med. Cell. Longev. 2013;601587.
Corti O, Lesage S, and Brice A. What genetics tells us about the causes and mechanism of Parkinson's disease. Physiol. Rev. 2011; 91:1161-218.
Deas E, Plun-Favreau H, and Gandhi S, et al. PINK1 cleavage at position A103 by the mitochondrial protease PARL. Hum. Mol. Genet. 2011; 20:867-79.
Valente EM, Abou-Sleiman PM, Caputo V, et al. Hereditary early-onset Parkinson's disease caused by mutations in PINK1. Science 2004; 304:1158-60.

Images



Western blot analysis of PINK1 in A431 cell lysate with PINK1 antibody at 1 µg/ml in (A) the absence and (B) the presence of blocking peptide.