

Parkin Polyclonal Antibody

Catalog # AP71776

Product Information

Application	WB, IHC-P, IF, ICC, E
Primary Accession	O60260
Reactivity	Human, Mouse, Rat, Chicken
Host	Rabbit
Clonality	Polyclonal
Calculated MW	51641

Additional Information

Gene ID	5071
Other Names	PARK2; PRKN; E3 ubiquitin-protein ligase parkin; Parkinson juvenile disease protein 2; Parkinson disease protein 2
Dilution	WB~~Western Blot: 1/500 - 1/2000. Immunohistochemistry: 1/100 - 1/300. ELISA: 1/10000. Not yet tested in other applications. IHC-P~~N/A IF~~1:50~200 ICC~~N/A E~~N/A
Format	Liquid in PBS containing 50% glycerol, 0.5% BSA and 0.09% (W/V) sodium azide.
Storage Conditions	-20°C

Protein Information

Name	PRKN (HGNC:8607)
Synonyms	PARK2
Function	Functions within a multiprotein E3 ubiquitin ligase complex, catalyzing the covalent attachment of ubiquitin moieties onto substrate proteins (PubMed: 10888878 , PubMed: 10973942 , PubMed: 11431533 , PubMed: 12150907 , PubMed: 12628165 , PubMed: 15105460 , PubMed: 16135753 , PubMed: 21376232 , PubMed: 21532592 , PubMed: 22396657 , PubMed: 23620051 , PubMed: 23754282 , PubMed: 24660806 , PubMed: 24751536 , PubMed: 29311685 , PubMed: 32047033). Substrates include SYT11 and VDAC1 (PubMed: 29311685 , PubMed: 32047033). Other substrates are BCL2, CCNE1, GPR37, RHOT1/MIRO1, MFN1, MFN2, STUB1, SNCAIP, SEPTIN5, TOMM20, USP30, ZNF746, MIRO1 and AIMP2 (PubMed: 10888878 , PubMed: 10973942 , PubMed: 11431533 , PubMed: 12150907 , PubMed: 12628165 , PubMed: 15105460 , PubMed: 16135753 , PubMed: 21376232 , PubMed: 21532592 , PubMed: 22396657 , PubMed: 23620051 ,

PubMed:[23754282](#), PubMed:[24660806](#), PubMed:[24751536](#)). Mediates monoubiquitination as well as 'Lys-6', 'Lys-11', 'Lys-48'-linked and 'Lys-63'-linked polyubiquitination of substrates depending on the context (PubMed:[19229105](#), PubMed:[20889974](#), PubMed:[25474007](#), PubMed:[25621951](#), PubMed:[32047033](#)). Participates in the removal and/or detoxification of abnormally folded or damaged protein by mediating 'Lys-63'-linked polyubiquitination of misfolded proteins such as PARK7: 'Lys-63'-linked polyubiquitinated misfolded proteins are then recognized by HDAC6, leading to their recruitment to aggresomes, followed by degradation (PubMed:[17846173](#), PubMed:[19229105](#)). Mediates 'Lys-63'-linked polyubiquitination of a 22 kDa O-linked glycosylated isoform of SNCAIP, possibly playing a role in Lewy-body formation (PubMed:[11431533](#), PubMed:[11590439](#), PubMed:[15105460](#), PubMed:[15728840](#), PubMed:[19229105](#)). Mediates monoubiquitination of BCL2, thereby acting as a positive regulator of autophagy (PubMed:[20889974](#)). Protects against mitochondrial dysfunction during cellular stress, by acting downstream of PINK1 to coordinate mitochondrial quality control mechanisms that remove and replace dysfunctional mitochondrial components (PubMed:[11439185](#), PubMed:[18957282](#), PubMed:[19029340](#), PubMed:[19966284](#), PubMed:[21376232](#), PubMed:[22082830](#), PubMed:[22396657](#), PubMed:[23620051](#), PubMed:[23933751](#), PubMed:[24660806](#), PubMed:[24784582](#), PubMed:[24896179](#), PubMed:[25474007](#), PubMed:[25527291](#), PubMed:[32047033](#)). Depending on the severity of mitochondrial damage and/or dysfunction, activity ranges from preventing apoptosis and stimulating mitochondrial biogenesis to regulating mitochondrial dynamics and eliminating severely damaged mitochondria via mitophagy (PubMed:[11439185](#), PubMed:[19029340](#), PubMed:[19801972](#), PubMed:[19966284](#), PubMed:[21376232](#), PubMed:[22082830](#), PubMed:[22396657](#), PubMed:[23620051](#), PubMed:[23685073](#), PubMed:[23933751](#), PubMed:[24896179](#), PubMed:[25527291](#), PubMed:[32047033](#), PubMed:[33499712](#)). Activation and recruitment onto the outer membrane of damaged/dysfunctional mitochondria (OMM) requires PINK1-mediated phosphorylation of both PRKN and ubiquitin (PubMed:[24660806](#), PubMed:[24784582](#), PubMed:[25474007](#), PubMed:[25527291](#)). After mitochondrial damage, functions with PINK1 to mediate the decision between mitophagy or preventing apoptosis by inducing either the poly- or monoubiquitination of VDAC1, respectively; polyubiquitination of VDAC1 promotes mitophagy, while monoubiquitination of VDAC1 decreases mitochondrial calcium influx which ultimately inhibits apoptosis (PubMed:[27534820](#), PubMed:[32047033](#)). When cellular stress results in irreversible mitochondrial damage, promotes the autophagic degradation of dysfunctional depolarized mitochondria (mitophagy) by promoting the ubiquitination of mitochondrial proteins such as TOMM20, RHOT1/MIRO1, MFN1 and USP30 (PubMed:[19029340](#), PubMed:[19966284](#), PubMed:[21753002](#), PubMed:[22396657](#), PubMed:[23620051](#), PubMed:[23685073](#), PubMed:[23933751](#), PubMed:[24896179](#), PubMed:[25527291](#)). Preferentially assembles 'Lys-6', 'Lys-11'- and 'Lys-63'-linked polyubiquitin chains, leading to mitophagy (PubMed:[25621951](#), PubMed:[32047033](#)). The PINK1-PRKN pathway also promotes fission of damaged mitochondria by PINK1-mediated phosphorylation which promotes the PRKN-dependent degradation of mitochondrial proteins involved in fission such as MFN2 (PubMed:[23620051](#)). This prevents the refusion of unhealthy mitochondria with the mitochondrial network or initiates mitochondrial fragmentation facilitating their later engulfment by autophagosomes (PubMed:[23620051](#)). Regulates motility of damaged mitochondria via 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](#)). Involved in mitochondrial biogenesis via the 'Lys-48'-linked polyubiquitination

of transcriptional repressor ZNF746/PARIS which leads to its subsequent proteasomal degradation and allows activation of the transcription factor PPARGC1A (PubMed:[21376232](#)). Limits the production of reactive oxygen species (ROS) (PubMed:[18541373](#)). Regulates cyclin-E during neuronal apoptosis (PubMed:[12628165](#)). In collaboration with CHPF isoform 2, may enhance cell viability and protect cells from oxidative stress (PubMed:[22082830](#)). Independently of its ubiquitin ligase activity, protects from apoptosis by the transcriptional repression of p53/TP53 (PubMed:[19801972](#)). May protect neurons against alpha synuclein toxicity, proteasomal dysfunction, GPR37 accumulation, and kainate-induced excitotoxicity (PubMed:[11439185](#)). May play a role in controlling neurotransmitter trafficking at the presynaptic terminal and in calcium-dependent exocytosis. May represent a tumor suppressor gene (PubMed:[12719539](#)).

Cellular Location

Cytoplasm, cytosol. Nucleus. Endoplasmic reticulum. Mitochondrion. Mitochondrion outer membrane {ECO:0000250|UniProtKB:Q9WVS6}. Cell projection, neuron projection. Postsynaptic density {ECO:0000250|UniProtKB:Q9WVS6}. Presynapse {ECO:0000250|UniProtKB:Q9WVS6}. Note=Mainly localizes in the cytosol (PubMed:19029340, PubMed:19229105). Co-localizes with SYT11 in neurites (PubMed:12925569). Co-localizes with SNCAIP in brainstem Lewy bodies (PubMed:10319893, PubMed:11431533). Translocates to dysfunctional mitochondria that have lost the mitochondrial membrane potential; recruitment to mitochondria is PINK1-dependent (PubMed:18957282, PubMed:19966284, PubMed:23620051, PubMed:24898855) Mitochondrial localization also gradually increases with cellular growth (PubMed:22082830).

Tissue Location

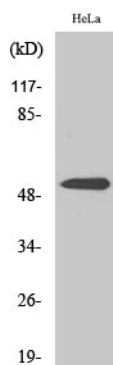
Highly expressed in the brain including the substantia nigra (PubMed:19501131, PubMed:9560156). Expressed in heart, testis and skeletal muscle (PubMed:9560156). Expression is down-regulated or absent in tumor biopsies, and absent in the brain of PARK2 patients (PubMed:12719539, PubMed:14614460). Overexpression protects dopamine neurons from kainate-mediated apoptosis (PubMed:12628165) Found in serum (at protein level) (PubMed:19501131)

Background

Functions within a multiprotein E3 ubiquitin ligase complex, catalyzing the covalent attachment of ubiquitin moieties onto substrate proteins, such as BCL2, SYT11, CCNE1, GPR37, RHOT1/MIRO1, MFN1, MFN2, STUB1, SNCAIP, SEPT5, TOMM20, USP30, ZNF746 and AIMP2 (PubMed:[10973942](#), PubMed:[10888878](#), PubMed:[11431533](#), PubMed:[12150907](#), PubMed:[12628165](#), PubMed:[16135753](#), PubMed:[21376232](#), PubMed:[23754282](#), PubMed:[23620051](#), PubMed:[24660806](#), PubMed:[24751536](#)). Mediates monoubiquitination as well as 'Lys-6', 'Lys-11', 'Lys-48'-linked and 'Lys-63'-linked polyubiquitination of substrates depending on the context (PubMed:[19229105](#), PubMed:[20889974](#), PubMed:[25621951](#)). Participates in the removal and/or detoxification of abnormally folded or damaged protein by mediating 'Lys-63'-linked polyubiquitination of misfolded proteins such as PARK7: 'Lys-63'-linked polyubiquitinated misfolded proteins are then recognized by HDAC6, leading to their recruitment to aggresomes, followed by degradation (PubMed:[17846173](#), PubMed:[19229105](#)). Mediates 'Lys-63'-linked polyubiquitination of a 22 kDa O-linked glycosylated isoform of SNCAIP, possibly playing a role in Lewy-body formation (PubMed:[11590439](#), PubMed:[11431533](#), PubMed:[19229105](#), PubMed:[11590439](#), PubMed:[15728840](#)). Mediates monoubiquitination of BCL2, thereby acting as a positive regulator of autophagy (PubMed:[20889974](#)). Promotes the autophagic degradation of dysfunctional depolarized mitochondria (mitophagy) by promoting the ubiquitination of mitochondrial proteins such as TOMM20, RHOT1/MIRO1 and USP30 (PubMed:[19029340](#), PubMed:[19966284](#), PubMed:[23620051](#), PubMed:[24896179](#), PubMed:[25527291](#)). Preferentially assembles 'Lys-6', 'Lys-11'- and 'Lys-63'-linked polyubiquitin chains following mitochondrial damage, leading to mitophagy (PubMed:[25621951](#)). Mediates 'Lys-48'-linked polyubiquitination of ZNF746, followed by degradation of ZNF746 by the proteasome; possibly playing a role in the regulation of neuron

death (PubMed:[21376232](#)). Limits the production of reactive oxygen species (ROS). Regulates cyclin-E during neuronal apoptosis. In collaboration with CHPF isoform 2, may enhance cell viability and protect cells from oxidative stress (PubMed:[22082830](#)). Independently of its ubiquitin ligase activity, protects from apoptosis by the transcriptional repression of p53/TP53 (PubMed:[19801972](#)). May protect neurons against alpha synuclein toxicity, proteasomal dysfunction, GPR37 accumulation, and kainate-induced excitotoxicity (PubMed:[11439185](#)). May play a role in controlling neurotransmitter trafficking at the presynaptic terminal and in calcium-dependent exocytosis. May represent a tumor suppressor gene.

Images



Western Blot analysis of various cells using Parkin Polyclonal Antibody

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