

Recombinant Human LRRK2 Protein

For Research Use Only

1. Basic Product Information

Catalog No.: REP50638

Size: 10ug, 100ug

Protein Name: Leucine-rich repeat serine/threonine-protein kinase 2 (EC 2.7.11.1) (EC 3.6.5.-) (Dardarin)

Synonym: LRRK2, PARK8

UniProt ID: Q5S007

UniProt Link: www.uniprot.org/uniprotkb/Q5S007/entry

Species Source: Human

Expression System: HEK293T eukaryotic cell expression system Sequence

Length: 2527 AA

Molecular Weight: 286 KD

Protein Tag: C-terminal His6

2. Amino Acid Sequence

MASGSCQGCEEDEETLKKLIVRLNNVQEGKQIETLVQILEDLLVFTYSERASKLFQGKNIHVPLLVLD
SYMRVASVQQVGWSLLCKLIEVCPGTMQSLMGPQDVGNDEVLGVHQLILKMLTVHNASVNLVIG
LKTLDLLLTSGKITLLILDEESDIFMLIFDAMHSFPANDEVQKLGCKALHVLFERVSEEQLTEFVENKDY
MILLSALTNFKDEEEIVLHVLHCLHSLAIPCNNVEVLMSGNVRCYNIVVEAMKAFPMSERIQEVSCCLL
HRLTLGNFFNILVLNEVHEFVVKAVQQYPENAALQISALSCLALLTETIFLNQDLEEKNNENQENDDEG
EEDKLFWLEACYKALTWHRKNKHVQEAACWALNNLLMYQNSLHEKIGDEDGHFPAHREVMLSMLM
HSSSKEVFQASANALSTLLEQNVNFRKILLSKGIHLNVLELMQKHIHSPEVAESGCKMLNHLFEGSNT
SLDIMAADVVPKILTVMKRHETSLPVQLEALRAILHFIVPGMPEESREDTEFHKLNMVKKQCFKNDIHK
LVLAALNRFIGNPGIQKCGLVKVISSIVHFPDALEMLSLEGAMDSVLHTLQMPYDDEIQCGLSLIGYLI
TKKNVFIGTGHELLAKILVSSLYRFKDVAEIQTKGFQTLAILKLSASFSLVHHSFDLVIFHQMSNIME
QKDQQFLNLCKCFKAVAMDDYLKNVMLERACDQNNSIMVECLLLLADANQAKEGSSLICQVCEK
ESSPKLVELLLNSGSREQDVRKALTISIGKGSQIISLLRLALDVANNICLGGFCIGKVEPSWLGPL
FPDKTSNLRKQTNIASTLARMVIRYQMKSAVEEGTAGSDGNFSEDVLSKFDEWTFIPDSSMDSVFA
QSDDLDESEGSEGSFLVKKKSNSISVGEFYRDAVLQRCSPNLQRHSNSLGPFDHEDLLKRKRKILSS
DDSLRSSKLQSHMRHSDSISSLASEREYITSLDLSANELRDIDALSQKCCISVHLEHLEKLELHQNAL
TFPQQQLCETLTKSLTHLDLHNSKFTSFPSYLLKMSCIANLDVSRNDIGPSVLDPTVKCPTLKQFNLSY
NQLSFVPENLTDVVEKLEQLILEGNKISGICSPRLKELKILNLSKNHISSENLEACPKEVESFSARM
NFLAAMPFLPPSMTILKLSQNKFCISPEAILNLPHLRSLDMSSNDIQYLPGAHWKSLNRLRELLFSHNQ



ISILDLSEKAYLWSRVEKLHLSHNKLKEIPPEIGCLENLTSLDVSYNLELRSFPNEMGKLSKIWDLPLDE
LHLNFDKFKHIGCKAKDIIRFLQQRLKKAVPYNRMKLMIVGNTGSGKTTLLQQLMKTKKSDLGMQSATV
GIDVKDWPIQIRDKRKRDLVLNVWDFAGREEFYSTHPHFMTRALYLAVYDLKSGQAEVDAMKPWL
FNIKARASSSPVILVGTHLDVSDEKQRKACMSKITKELLNKRGFPAIRDYHFVNATEESDALAKLRKTII
NESLNFKIRDQLVVGQLIPDCYVELEKIILSERKNVPIEFVIDRKRLLQLVRENQLQLDENELPHAVHF
LNEGVLHFDQDPALQLSDLYFVEPKWLCKIMAQILTVKVEGCPKHPKGIISRRDVEKFLSKKRKFPK
NYMSQYFKLLEKFQIALPIGEEYLLVPSSLSLSDHRPVIELPHCENSEIIIRLYEMPYFPMGFWSRLINRLL
EISPYMLSGRERARLPNRMWRQGIYLNWSPEAYCLVGSEVLDNHPESFLKITVPSCRKGCILLGQV
VDHIDSLMEEWFPGLLEIDICGEGETLLKKWALYSFNDGEEHQKILLDDLMKKAEEGDLLVNPDPQRL
TIPISQIAPDLILADLPNIMLNDELEFEQAPEFLLGDGSGFSVYRAAYEGEEVAVKIFNKHTSLRLLR
QELVVLCHLHHPSLISLLAAGIRPRMLVMELASKGSLDRLLQQDKASLTRLQHRIALHVADGLRYLH
SAMIIYRDLKPHNVLLFTLYPNAAIIAKIADYGIAQYCCRMGIKTSEGTGPFRAPEVARGNVIYNQQAD
VYSFGLLLYDILTGGGRIVEGLKFPNEFDELEIQGKLDPVKEYGCAPWPMVEKLIKQCLKENPQERP
TSAQVFDILNSAELVCLTRILLPKNVIVECMVATHHNSRNASIWLGCGHTRGQLSFLDLNTEGYTS
EEVADSRILCLALVHLPVEKESWIVSGTQSGTLLVINTEDGKKRHTLEKMTDSVTCLYCNSFSKQSKQ
KNFLLVGTADGKLAIFEDKTVKLKGAAPLKILNIGNVSTPLMCLSESTNSTERNVMWGGCGTKIFSFS
NDFTIQKLIETRTSQLFSYAAFSDSNITVVVDALYIAKQNSPVVEVWDKTEKLCGLIDCVHFLREVM
VKENKESKHKMSYSGRVKTLCLQKNTALWIGTGGGHILLDLSTRRLIRVIYNFCNSVRVMMTAQLG
SLKNVMLVLGYNRKNTEGTQKQKEIQSCLTVWDINLPHEVQNLEKHIEVRKELAEKMRRTSVE

3. Buffer Composition

Liquid format: PBS-based buffer containing 50% glycerol. Glycerol concentration can be customized upon customer request; please state special requirements when placing your order.

Lyophilized format: Buffer before lyophilization is PBS supplemented with 6% trehalose.

4. Storage Conditions

Upon receipt, store the product at -20 °C or -80 °C. Aliquot the product for on-demand use to preserve protein activity and prevent denaturation and inactivation caused by repeated freeze-thaw cycles.

5. Product Description

This product is recombinant Leucine-rich repeat serine/threonine-protein kinase 2 (EC 2.7.11.1) (EC 3.6.5.-) (Dardarin) produced using the HEK293T eukaryotic cell expression system. It is suitable for in-vitro functional assays, protein-protein interaction studies, antibody preparation and other biomedical research applications.

Protein Function: Serine/threonine-protein kinase which phosphorylates a broad range of proteins involved in multiple processes such as neuronal plasticity, innate immunity, autophagy, and vesicle trafficking (PubMed:17114044, PubMed:20949042, PubMed:21850687, PubMed:22012985, PubMed:23395371, PubMed:24687852, PubMed:25201882, PubMed:26014385, PubMed:26824392, PubMed:27830463, PubMed:28720718, PubMed:29125462, PubMed:29127255, PubMed:29212815, PubMed:30398148, PubMed:30635421). Is a key regulator of RAB GTPases by regulating the GTP/GDP exchange and interaction partners of RABs through phosphorylation (PubMed:26824392, PubMed:28720718, PubMed:29125462, PubMed:29127255, PubMed:29212815, PubMed:30398148, PubMed:30635421). Phosphorylates RAB3A, RAB3B, RAB3C, RAB3D, RAB5A, RAB5B, RAB5C, RAB8A, RAB8B, RAB10, RAB12, RAB29, RAB35, and RAB43 (PubMed:23395371, PubMed:26824392, PubMed:28720718, PubMed:29125462, PubMed:29127255, PubMed:29212815, PubMed:30398148, PubMed:30635421, PubMed:38127736). Regulates the RAB3IP-catalyzed GDP/GTP exchange for RAB8A through the phosphorylation of 'Thr-72' on RAB8A

(PubMed:26824392). Inhibits the interaction between RAB8A and GDI1 and/or GDI2 by phosphorylating 'Thr-72' on RAB8A (PubMed:26824392). Regulates primary ciliogenesis through phosphorylation of RAB8A and RAB10, which promotes SHH signaling in the brain (PubMed:29125462, PubMed:30398148). Together with RAB29, plays a role in the retrograde trafficking pathway for recycling proteins, such as mannose-6-phosphate receptor (M6PR), between lysosomes and the Golgi apparatus in a retromer-dependent manner (PubMed:23395371). Regulates neuronal process morphology in the intact central nervous system (CNS) (PubMed:17114044). Plays a role in synaptic vesicle trafficking (PubMed:24687852). Plays an important role in recruiting SEC16A to endoplasmic reticulum exit sites (ERES) and in regulating ER to Golgi vesicle-mediated transport and ERES organization (PubMed:25201882). Positively regulates autophagy through a calcium-dependent activation of the CaMKK/AMPK signaling pathway (PubMed:22012985). The process involves activation of nicotinic acid adenine dinucleotide phosphate (NAADP) receptors, increase in lysosomal pH, and calcium release from lysosomes (PubMed:22012985). Phosphorylates PRDX3 (PubMed:21850687). By phosphorylating APP on 'Thr-743', which promotes the production and the nuclear translocation of the APP intracellular domain (AICD), regulates dopaminergic neuron apoptosis (PubMed:28720718). Acts as a positive regulator of innate immunity by mediating phosphorylation of RIPK2 downstream of NOD1 and NOD2, thereby enhancing RIPK2 activation (PubMed:27830463). Independent of its kinase activity, inhibits the proteasomal degradation of MAPT, thus promoting MAPT oligomerization and secretion (PubMed:26014385). In addition, has GTPase activity via its Roc domain which regulates LRRK2 kinase activity (PubMed:18230735, PubMed:26824392, PubMed:28720718, PubMed:29125462, PubMed:29212815). Recruited by RAB29/RAB7L1 to overloaded lysosomes where it phosphorylates and stabilizes RAB8A and RAB10 which promote lysosomal content release and suppress lysosomal enlargement through the EHBP1 and EHBP1L1 effector proteins (PubMed:30209220, PubMed:38227290).

Subcellular Localization: Cytoplasmic vesicle . Perikaryon . Golgi apparatus membrane ; Peripheral membrane protein . Cell projection, axon . Cell projection, dendrite . Endoplasmic reticulum membrane ; Peripheral membrane protein . Cytoplasmic vesicle, secretory vesicle, synaptic vesicle membrane . Endosome . Lysosome . Mitochondrion outer membrane ; Peripheral membrane protein . Cytoplasm, cytoskeleton . Cytoplasmic vesicle, phagosome . Note=Colocalized with RAB29 along tubular structures emerging from Golgi apparatus (PubMed:23395371, PubMed:38127736). Localizes to endoplasmic reticulum exit sites (ERES), also known as transitional endoplasmic reticulum (tER) (PubMed:25201882). Detected on phagosomes and stressed lysosomes but not detected on autophagosomes induced by starvation (By similarity). Recruitment to stressed lysosomes is dependent on the ATG8 conjugation system composed of ATG5, ATG12 and ATG16L1 and leads to lysosomal stress-induced activation of LRRK2 (By similarity).

6. Notes

- Avoid repeated freeze-thaw cycles to maintain protein stability and biological activity.
- Please specify special buffer-composition requirements at the time of order placement.
- For research use only. Not intended for clinical diagnosis, therapeutic use or commercial manufacturing.