

Recombinant Human NLRP3 Protein

For Research Use Only

1. Basic Product Information

Catalog No.: REP50724

Size: 10ug, 100ug

Protein Name: NACHT, LRR and PYD domains-containing protein 3 (EC 3.6.4.-)
(Angiotensin/vasopressin receptor AII/AVP-like) (Caterpillar protein 1.1) (CLR1.1) (Cold-induced autoinflammatory syndrome 1 protein) (Cryopyrin) (PYRIN-containing APAF1-like protein 1)

Synonym: NLRP3, C1orf7, CIAS1, NALP3, PYPAF1

UniProt ID: Q96P20

UniProt Link: www.uniprot.org/uniprotkb/Q96P20/entry

Species Source: Human

Expression System: HEK293T eukaryotic cell expression system Sequence

Length: 1036 AA

Molecular Weight: 118 KD

Protein Tag: C-terminal His6

2. Amino Acid Sequence

MKMASTRCKLARYLEDLEDVDLKKFKMHLEDYPPQKGCIPLPRGQTEKADHVDLATLMIDFNGECKA
WAMAVWIFAAINRRDLYEAKRDEPKWGS DNARVSNPTVICQEDSIEEEWMGLLEYLSRISICKMKK
DYRK KYRKYVRSRFQCIEDRNARLGESVSLNKRYTRLRLIKEHRSQQEREQELLAIGKTKTCESPVS
PIKMELLFDPDDEHSEPVHTTVVFQGAAGIGKTLARKMMLDWASGTLYQDRFDYLFYIHCREVSLVT
QRS LGDLIMSCCPDPNPPIHKIVRKPSRILFLMDGFDELQGA FDEHIGPLCTDWQKAERGDILLSSLIR
KKLLPEASLLITTRPVALEKLQHLLDHPRHVEILGFSEAKRKEYFFKYFSDEAQAARAAFSLIQENEVLFT
MCFIPLVCWIVCTGLKQQMESGKSLAQTSKTTTAVYVFFLSLLQPRGGSQEHLCAHLWGLCSLA
ADGIWNQKILFEESDLRNHGLQKADVSAFLRMNLFQKEVDCEKFYSFIHMTFQEFFAAMYYLLEEEK
EGRTNVP GSRLKLPSRDVTVLLENYGKFEKGYLIFVVRFLFGLVNQERTSYLEKKLSCKISQQIRLELL
KWIEVKAKAKKLQIQPSQLELFYCLYEMQEEDFVQRAMDYFPKIEINLSTRMDH MVSSFCIENCHRVE
SLSLGFLHNMPKEEEEEKEGRHLD MVQCVPSSSHAACSHGLVNSHLTSSFCRGLFSVLSTSQSL
TELDLSDNSLGDPGMRVLCETLQHPGCNIRRLWLGRGCLSHECCFDISLVSSNQKLVELDLSDNAL
GDFGIRLLCVGLKHLLCNLKKLWLVSCLTSACQDLASVLSTSHSLTRLYVGENALGDSGVAILCEK
AKNPQC NLQKLGLVNSGLTSVCCSALSSVLSTNQNLTHLYLRGNTLGDKGIKLLCEGLLHPDCKLQV
LELDNCNL TSHCCWDLSTLLTSSQSLRKLSLGNNDLGDLGVMMFCEVLKQQSCLLQNLGLSEMYFN
YETKSALETLQEEKPELTVVFEP SW



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 NACHT, LRR and PYD domains-containing protein 3 (EC 3.6.4.-) (Angiotensin/vasopressin receptor AII/AVP-like) (Caterpillar protein 1.1) (CLR1.1) (Cold-induced autoinflammatory syndrome 1 protein) (Cryopyrin) (PYRIN-containing APAF1-like protein 1) 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: Sensor component of the NLRP3 inflammasome, which mediates inflammasome activation in response to defects in membrane integrity, leading to secretion of inflammatory cytokines IL1B and IL18 and pyroptosis (PubMed:16407889, PubMed:18403674, PubMed:18604214, PubMed:23582325, PubMed:25686105, PubMed:27929086, PubMed:28656979, PubMed:28847925, PubMed:30487600, PubMed:30612879, PubMed:31086327, PubMed:31086329, PubMed:31189953, PubMed:33231615, PubMed:34133077, PubMed:34341353, PubMed:34512673, PubMed:36442502, PubMed:40250624, PubMed:40450990). In response to pathogens and other damage-associated signals that affect the integrity of membranes, initiates the formation of the inflammasome polymeric complex composed of NLRP3, CASP1 and PYCARD/ASC (PubMed:16407889, PubMed:18403674, PubMed:27432880, PubMed:28847925, PubMed:31189953, PubMed:33231615, PubMed:34133077, PubMed:34341353, PubMed:36142182, PubMed:36442502). Recruitment of pro-caspase-1 (proCASP1) to the NLRP3 inflammasome promotes caspase-1 (CASP1) activation, which subsequently cleaves and activates inflammatory cytokines IL1B and IL18 and gasdermin-D (GSDMD), promoting cytokine secretion and pyroptosis (PubMed:23582325, PubMed:28847925, PubMed:31189953, PubMed:33231615, PubMed:34133077, PubMed:34341353). Activation of NLRP3 inflammasome is also required for HMGB1 secretion; stimulating inflammatory responses (PubMed:22801494). Involved in the homeostatic wound healing response to tissue injury, a multistep cascade that guides neutrophil migration to necrotic sites while avoiding collateral damage of healthy tissues. ATP released from necrotic cells triggers activation of NLRP3 inflammasome through P2RX7 signaling leading to neutrophil adhesion to the vascular endothelium close to the injury site (By similarity). Under resting conditions, ADP-bound NLRP3 is autoinhibited (PubMed:35114687). NLRP3 activation stimuli include extracellular ATP, nigericin, reactive oxygen species, crystals of monosodium urate or cholesterol, amyloid-beta fibers, environmental or industrial particles and nanoparticles, such as asbestos, silica, aluminum salts, cytosolic dsRNA, etc (PubMed:16407889, PubMed:18403674, PubMed:18604214, PubMed:19414800, PubMed:23871209). Almost all stimuli trigger intracellular K(+) efflux (By similarity). These stimuli lead to membrane perturbation and activation of NLRP3 (By similarity). Upon activation, NLRP3 is transported to microtubule organizing center (MTOC), where it is unlocked by NEK7, leading to its relocalization to dispersed trans-Golgi network (dTGN) vesicle membranes and formation of an active inflammasome complex (PubMed:36442502, PubMed:39173637). Associates with dTGN vesicle membranes by binding to phosphatidylinositol 4-phosphate (PtdIns4P) (PubMed:30487600, PubMed:34554188). Shows ATPase activity (PubMed:17483456).; Independently of inflammasome

activation, regulates the differentiation of T helper 2 (Th2) cells and has a role in Th2 cell-dependent asthma and tumor growth (By similarity). During Th2 differentiation, required for optimal IRF4 binding to IL4 promoter and for IRF4-dependent IL4 transcription (By similarity). Binds to the consensus DNA sequence 5'-GRRGGNRGAG-3' (By similarity). May also participate in the transcription of IL5, IL13, GATA3, CCR3, CCR4 and MAF (By similarity).

Subcellular Localization: Cytoplasm, cytosol . Inflammasome . Cytoplasm, cytoskeleton, microtubule organizing center . Golgi apparatus membrane . Endoplasmic reticulum . Mitochondrion . Secreted . Nucleus . Note=In macrophages, under resting conditions, mainly located in the cytosol and on membranes of various organelles, such as endoplasmic reticulum, mitochondria and Golgi: forms an inactive double-ring cage that is primarily localized on membranes (By similarity). Upon activation, NLRP3 is transported to microtubule organizing center (MTOC), where it is unlocked by NEK7, leading to its relocation to dispersed trans-Golgi network (dTGN) vesicle membranes for the formation of an active inflammasome complex (PubMed:39173637). Recruited to dTGN vesicle membranes by binding to phosphatidylinositol 4-phosphate (PtdIns4P) (PubMed:30487600). After the induction of pyroptosis, inflammasome specks are released into the extracellular space where they can further promote IL1B processing and where they can be engulfed by macrophages (PubMed:24952504). Phagocytosis induces lysosomal damage and inflammasome activation in the recipient cells (PubMed:24952504). In the Th2 subset of CD4(+) helper T cells, mainly located in the nucleus (By similarity). Nuclear localization depends upon KPNA2 (By similarity). In the Th1 subset of CD4(+) helper T cells, mainly cytoplasmic (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.