

Recombinant Mouse NOD2 Protein

For Research Use Only

1. Basic Product Information

Catalog No.: REP51784

Size: 10ug, 100ug

Protein Name: Nucleotide-binding oligomerization domain-containing protein 2 (Caspase recruitment domain-containing protein 15)

Synonym: Nod2, Card15

UniProt ID: Q8K3Z0

UniProt Link: www.uniprot.org/uniprotkb/Q8K3Z0/entry

Species Source: Mouse

Expression System: HEK293T eukaryotic cell expression system Sequence

Length: 1020 AA

Molecular Weight: 114 KD

Protein Tag: C-terminal His6

2. Amino Acid Sequence

MRSSCCDMCSQEEFQAQRSQVLALLISGSLEGFESILDWLLSWDVLSREDYEGLSLPGQPLSHSAR
RLDVTWVWNGVWGCQKLEAVQEAQANSHTFELYGSWDTHSLHPTDRLQSHRPAIVRRLYNHVEA
MLELAREGGFLSQYECIEIRLPIFTSSQRARRLLDLAAVKANGLAFLQHVRELPAPLPLPYEAAEC
QKFISKLRTMVLTSRFLSTYDGSNLCLEDIYTENILELQTEVGTAGALQKSPAILGLEDLFDTHGHL
NRDADTILVVGEGSGKSTLLQRLHLLWATGRSFQEFIFPFSCRQLQCVAKPLSLRTLLFEHCCW
PDVAQDDVFQFLLDHPDRVLLTFDGLDEFKFRFTDRERHCSPIDPTSVQTLLFNLLQGNLLKNACKVL
TSRPDAVSALLRKFRVTELQKGFSEEGIQLYLRKHHREPGVADRILIQATSAHGLCHLPVFSWM
VSRCHRELLQLNRGFPTTSTDMYLLILQHFLHASPPDSSPLGLGPGLLQSRLSTLLHLGHLALRGLA
MSCYVFSAQQQLQAAQVDSDDISLGLVRAQSSVPGSKAPLEFLHITFQCFFAAFYLAVSADTSVASLK
HLFSCGRLGSSLLGRLLPNLCIQGSRVKKGSEAALLQKAEPHNLQITAAFLAGLLSQQHRDLLAACQV
SERVLLQRQARARSCLAHSLEHFHSIPPAVPGETKSMHAMPGFIVLIRSLYEMQEEQLAQEAVRRL
DIGHLKLTFCRVGPAECAALAFVLQHLQRPVALQLDYNVSGDVGVGEQLRPCLGVCTALYLRDNNISD
RGARTLVECALRCEQLQKLALFNNKLTACACSMKLLAHKQNFSLRVGNNHITAAGAEVLAQGLK
SNTSLKFLGFWGNSVGDKGTQALAEVVADHQNKLWLSLVGNNIGSMGAELALMLEKNKSLEELCL
EENHICDEGVYSLAELGRNSTLKLKLSNNGITYRGAEALLQALSRNSAILEVWLRGNTFSLEEIQTL
SSRDARLLL



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 Nucleotide-binding oligomerization domain-containing protein 2 (Caspase recruitment domain-containing protein 15) 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: Pattern recognition receptor (PRR) that detects bacterial peptidoglycan fragments and other danger signals and plays an important role in gastrointestinal immunity (PubMed:15692051, PubMed:15692052, PubMed:19805227, PubMed:21715553). Specifically activated by muramyl dipeptide (MDP), a fragment of bacterial peptidoglycan found in every bacterial peptidoglycan type (PubMed:15692051, PubMed:15692052, PubMed:25429073). NOD2 specifically recognizes and binds 6-O-phospho-MDP, the phosphorylated form of MDP, which is generated by NAGK (PubMed:36002575). 6-O-phospho-MDP-binding triggers oligomerization that facilitates the binding and subsequent activation of the proximal adapter receptor-interacting RIPK2 (PubMed:15692051, PubMed:15692052, PubMed:22607974). Following recruitment, RIPK2 undergoes 'Met-1'- (linear) and 'Lys-63'-linked polyubiquitination by E3 ubiquitin-protein ligases XIAP, BIRC2, BIRC3 and the LUBAC complex, becoming a scaffolding protein for downstream effectors, triggering activation of the NF-kappa-B and MAP kinases signaling (PubMed:15692051, PubMed:15692052, PubMed:22607974). This in turn leads to the transcriptional activation of hundreds of genes involved in immune response (PubMed:22607974). Its ability to detect bacterial MDP plays a central role in maintaining the equilibrium between intestinal microbiota and host immune responses to control inflammation (PubMed:19805227, PubMed:21421666, PubMed:23281400, PubMed:24062413, PubMed:24882705, PubMed:25088769, PubMed:25666722, PubMed:28127403). An imbalance in this relationship results in dysbiosis, whereby pathogenic bacteria prevail on commensals, causing damage in the intestinal epithelial barrier as well as allowing bacterial invasion and inflammation (PubMed:23281400, PubMed:25088769). Acts as a regulator of appetite by sensing MDP in a subset of brain neurons: microbiota-derived MDP reach the brain, where they bind and activate NOD2 in inhibitory hypothalamic neurons, decreasing neuronal activity, thereby regulating satiety and body temperature (PubMed:35420957). NOD2-dependent MDP-sensing of bacterial cell walls in the intestinal epithelial compartment contributes to sustained postnatal growth upon undernutrition (PubMed:36821686). Also plays a role in antiviral response by acting as a sensor of single-stranded RNA (ssRNA) from viruses: upon ssRNA-binding, interacts with MAVS, leading to activation of interferon regulatory factor-3/IRF3 and expression of type I interferon (By similarity). Also acts as a regulator of autophagy in dendritic cells via its interaction with ATG16L1, possibly by recruiting ATG16L1 at the site of bacterial entry (PubMed:19898471, PubMed:19966812, PubMed:27230380). NOD2 activation in the small intestine crypt also contributes to intestinal stem cells survival and acts by promoting mitophagy via its association with ATG16L1 (PubMed:31919280). In addition to its main role in innate immunity, also regulates the adaptive immune system by acting as regulator of helper T-cell and regulatory T-cells (Tregs) (PubMed:21856952, PubMed:27230380). Besides recognizing pathogens, also involved in the endoplasmic reticulum stress response: acts by sensing and binding

to the cytosolic metabolite sphingosine-1-phosphate generated in response to endoplasmic reticulum stress, initiating an inflammation process that leads to activation of the NF-kappa-B and MAP kinases signaling (PubMed:27007849). May also be involved in NLRP1 activation following activation by MDP, leading to CASP1 activation and IL1B release in macrophages (PubMed:18511561).

Subcellular Localization: Cell membrane ; Lipid-anchor . Basolateral cell membrane . Cytoplasm . Mitochondrion . Note=Palmitoylation promotes localization to the cell membrane, where it detects bacterial invasion at the point of entry.

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.