

Recombinant Human NOD2 Protein

For Research Use Only

1. Basic Product Information

Catalog No.: REP50729

Size: 10ug, 100ug

Protein Name: Nucleotide-binding oligomerization domain-containing protein 2 (Caspase recruitment domain-containing protein 15) (Inflammatory bowel disease protein 1)

Synonym: NOD2, CARD15

UniProt ID: Q9HC29

UniProt Link: www.uniprot.org/uniprotkb/Q9HC29/entry

Species Source: Human

Expression System: HEK293T eukaryotic cell expression system Sequence

Length: 1040 AA

Molecular Weight: 115 KD

Protein Tag: C-terminal His6

2. Amino Acid Sequence

MGEEGGSASHDEEERASVLLGHSPGCEMCSQEAFQAQRSQVLVSGSLEGFESVLDWLLSWEV
LSWEDYEGFHLLGQPLSHLARRLLDTVWNKGTWACQKLIAAQEAQADSQSPKLHGCWDPHSLHP
ARDLQSHRPAIVRRLHSHVENMLDLAWERGFVSQYECDEIRLPIFTPSQRRARLLDLATVKANGLAA
FLLQHVQELPVPLALPLEAATCKKMAKLRTTVSAQSRFLSTYDGAETLCLEDIYTENVLEWADV
MAGPPQKSPATLGLEELFSTPGHLNDDADTVLVVGEAGSGKSTLLQRLHLLWAAGQDFQEFLVFP
FSCRQLQCMAPLSVRTLLFEHCCWPDVVGQEDIFQLLLDHPDRVLLTFDGFDEFKFRFTDRERHCS
PTDPTSVQTLLFNLLQGNLLKNARKVVTSRPAAVSAFLRKYIRTEFNLKGFSEQGIELYLRKRHHEPG
VADRILIRLLQETSALHGLCHLPVFSWMVSKCHQELLQEGGSPKTTTDMYLLILQHFLHATPPDSAS
QGLGPSLLRGRPLTLLHLGRLALWGLGMCCYVFSAAQLQAAQVSPDDISLGLVRAKGVVPGSTAP
LEFLHITFQCFFAAFYLAALSADVPPALLRHLFNCGRPGNSPMARLLPTMCIQASEGKDSSVAALLQKA
EPHNLQITAAFLAGLLSREHWGLLAECQTSEKALLRRQACARWCLARSLRKHFHSIPPAAPGEAKSV
HAMPGFIWLIRSLYEMQEERLARKAARGLNVGHLKLTFCVGPTECAALAFVLQHLRRPVALQLDYN
SVGDIGVEQLLPCLGVCKALYLRDNNISDRGICKLIECALHCEQLQKLALFNNKLTGCAHSMALLA
CRQNFLALRLGNNYITAAGAQVLAEGLRGNTSLQFLGFWGNRVGDEGAQALAEALGDHQSLRWLS
LVGNNIGSVGAQALALMLAKNVMLEELCLEENHLQDEGVCSLAEGLKKNSSLKILKLSNNCITYLGAE
ALLQALERNDTILEVWLRGNTFSLEEVDKLGCRDTRLL



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) (Inflammatory bowel disease 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: Pattern recognition receptor (PRR) that detects bacterial peptidoglycan fragments and other danger signals and plays an important role in gastrointestinal immunity (PubMed:12514169, PubMed:12527755, PubMed:12626759, PubMed:15044951, PubMed:15998797, PubMed:27283905, PubMed:27748583, PubMed:31649195). Specifically activated by muramyl dipeptide (MDP), a fragment of bacterial peptidoglycan found in every bacterial peptidoglycan type (PubMed:12514169, PubMed:12527755, PubMed:12626759, PubMed:12871942, PubMed:15044951, PubMed:15198989, PubMed:15998797, PubMed:22857257, PubMed:23322906, PubMed:27748583, PubMed:36002575). 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:11087742, PubMed:17355968, PubMed:21887730, PubMed:23806334, PubMed:28436939). 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:11087742, PubMed:12514169, PubMed:12626759, PubMed:15198989, PubMed:21887730, PubMed:23322906, PubMed:23806334, PubMed:28436939). This in turn leads to the transcriptional activation of hundreds of genes involved in immune response (PubMed:15198989). Its ability to detect bacterial MDP plays a central role in maintaining the equilibrium between intestinal microbiota and host immune responses to control inflammation (By similarity). 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 (By similarity). 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 (By similarity). NOD2-dependent MDP-sensing of bacterial cell walls in the intestinal epithelial compartment contributes to sustained postnatal growth upon undernutrition (By similarity). 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 (PubMed:19701189). 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:20637199). NOD2 activation in the small intestine crypt also contributes to intestinal stem cells survival and acts by promoting mitophagy via its association with ATG16L1 (By similarity). 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) (By similarity). 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, PubMed:33942347). May also be involved in NLRP1 activation following activation by MDP, leading to CASP1 activation and IL1B release in macrophages (PubMed:18511561).; [Isoform 2]: Acts as a pattern recognition receptor (PRR); able to activate NF-kappa-B.; [Isoform 3]: Can activate NF-kappa-B in a muramyl dipeptide (MDP)-independent manner.

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.; [Isoform 3]: Cytoplasm .

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.