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Anti-Caspase 4 Antibody

Catalog # AP51043

Product Information

Application	WB, IHC, IF/IC
Primary Accession	P49662
Reactivity	Human
Host	Rabbit
Clonality	Polyclonal
Calculated MW	43262

Additional Information

Gene ID	837
Other Names	ICH2; Caspase-4; CASP-4; ICE(rel)-II; Protease ICH-2; Protease TX
Target/Specificity	KLH-conjugated synthetic peptide encompassing a sequence within the center region of human Caspase 4. The exact sequence is proprietary.
Dilution	WB~~WB (1/500 - 1/1000) IHC~~1:100~500 IF/IC~~N/A
Format	Liquid in 0.42% Potassium phosphate, 0.87% Sodium chloride, pH 7.3, 30% glycerol, and 0.01% sodium azide.
Storage	Store at -20 °C.Stable for 12 months from date of receipt

Protein Information

Name	CASP4 {ECO:0000303|PubMed:15123740, ECO:0000312|HGNC:HGNC:1505}
Function	Inflammatory caspase that acts as the effector of the non- canonical inflammasome by mediating lipopolysaccharide (LPS)-induced pyroptosis (PubMed:25119034, PubMed:26375003, PubMed:32109412, PubMed:34671164, PubMed:37001519, PubMed:37993712, PubMed:37993714). Also indirectly activates the NLRP3 and NLRP6 inflammasomes (PubMed:23516580, PubMed:26375003, PubMed:32109412, PubMed:7797510). Acts as a thiol protease that cleaves a tetrapeptide after an Asp residue at position P1: catalyzes cleavage of CGAS, GSDMD and IL18 (PubMed:15326478, PubMed:23516580, PubMed:26375003, PubMed:28314590, PubMed:32109412, PubMed:37993712, PubMed:37993714, PubMed:7797510). Effector of the non-canonical inflammasome independently of NLRP3 inflammasome and CASP1: the non-canonical inflammasome promotes pyroptosis through GSDMD cleavage without involving secretion of cytokine IL1B (PubMed:25119034, PubMed:25121752, PubMed:26375003, PubMed:31268602, PubMed:32109412, PubMed:37993712, PubMed:37993714). In the

non-canonical inflammasome, CASP4 is activated by direct binding to the lipid A moiety of LPS without the need of an upstream sensor (PubMed:25119034, PubMed:25121752, PubMed:29520027, PubMed:32510692, PubMed:32581219, PubMed:37993712). LPS-binding promotes CASP4 activation and CASP4-mediated cleavage of GSDMD and IL18, followed by IL18 secretion through the GSDMD pore, pyroptosis of infected cells and their extrusion into the gut lumen (PubMed:25119034, PubMed:25121752, PubMed:37993712, PubMed:37993714). Also indirectly promotes secretion of mature cytokines (IL1A and HMGB1) downstream of GSDMD-mediated pyroptosis via activation of the NLRP3 and NLRP6 inflammasomes (PubMed:26375003, PubMed:32109412). Involved in NLRP3-dependent CASP1 activation and IL1B secretion in response to non-canonical activators, such as UVB radiation or cholera enterotoxin (PubMed:22246630, PubMed:23516580, PubMed:24879791, PubMed:25964352, PubMed:26173988, PubMed:26174085, PubMed:26508369). Involved in NLRP6 inflammasome-dependent activation in response to lipoteichoic acid (LTA), a cell- wall component of Gram-positive bacteria, which leads to CASP1 activation and IL1B secretion (PubMed:33377178). Involved in LPS- induced IL6 secretion; this activity may not require caspase enzymatic activity (PubMed:26508369). The non-canonical inflammasome is required for innate immunity to cytosolic, but not vacuolar, bacteria (By similarity). Plays a crucial role in the restriction of S.typhimurium replication in colonic epithelial cells during infection (PubMed:25121752, PubMed:25964352). Activation of the non-canonical inflammasome in brain endothelial cells can lead to excessive pyroptosis, leading to blood-brain barrier breakdown (By similarity). Pyroptosis limits bacterial replication, while cytokine secretion promotes the recruitment and activation of immune cells and triggers mucosal inflammation (PubMed:25121752, PubMed:25964352, PubMed:26375003). May also act as an activator of adaptive immunity in dendritic cells, following activation by oxidized phospholipid 1- palmitoyl-2-arachidonoyl-sn-glycero-3-phosphorylcholine, an oxidized phospholipid (oxPAPC) (By similarity). Involved in cell death induced by endoplasmic reticulum stress and by treatment with cytotoxic APP peptides found in Alzheimer's patient brains (PubMed:15123740, PubMed:22246630, PubMed:23661706). Cleavage of GSDMD is not strictly dependent on the consensus cleavage site but depends on an exosite interface on CASP4 that recognizes and binds the Gasdermin-D, C- terminal (GSDMD-CT) part (PubMed:32109412). Catalyzes cleavage and maturation of IL18; IL18 processing also depends of the exosite interface on CASP4 (PubMed:15326478, PubMed:37993712, PubMed:37993714). In contrast, it does not directly process IL1B (PubMed:7743998, PubMed:7797510, PubMed:7797592). During non-canonical inflammasome activation, cuts CGAS and may play a role in the regulation of antiviral innate immune activation (PubMed:28314590).

Cellular Location

Cytoplasm, cytosol. Endoplasmic reticulum membrane; Peripheral membrane protein; Cytoplasmic side. Mitochondrion Inflammasome. Secreted Note=Predominantly localizes to the endoplasmic reticulum (ER) Association with the ER membrane requires TMEM214 (PubMed:15123740) Released in the extracellular milieu by keratinocytes following UVB irradiation (PubMed:22246630).

Tissue Location

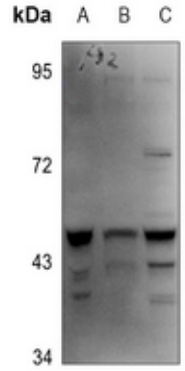
Widely expressed, including in keratinocytes and colonic and small intestinal epithelial cells (at protein level). Not detected in brain.

References

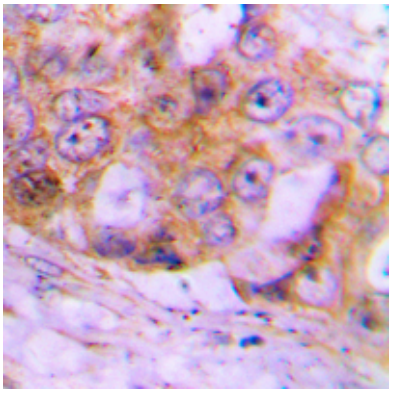
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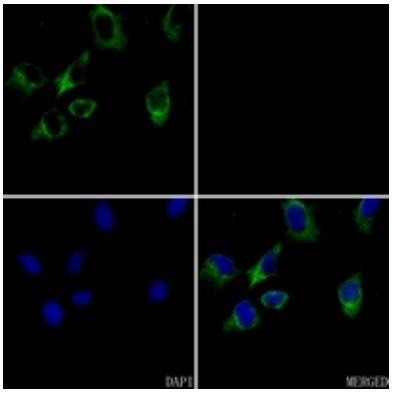
Images



Western blot analysis of Caspase 4 expression in THP1 (A), Panc1 (B), LO2 (C) whole cell lysates. (Predicted band size: 43 kD; Observed band size: 50 kD)



Immunohistochemical analysis of Caspase 4 staining in human lung cancer formalin fixed paraffin embedded tissue section. The section was pre-treated using heat mediated antigen retrieval with sodium citrate buffer (pH 6.0). The section was then incubated with the antibody at room temperature and detected using an HRP conjugated compact polymer system. DAB was used as the chromogen. The section was then counterstained with haematoxylin and mounted with DPX.



Immunofluorescent analysis of Caspase 4 staining in HEK293T cells. Formalin-fixed cells were permeabilized with 0.1% Triton X-100 in TBS for 5-10 minutes and blocked with 3% BSA-PBS for 30 minutes at room temperature. Cells were probed with the primary antibody in 3% BSA-PBS and incubated overnight at 4 °C in a hidified chamber. Cells were washed with PBST and incubated with a AF488-conjugated secondary antibody (green) in PBS at room temperature in the dark. Phalloidin - AF594 was used to stain Actin filaments (red). DAPI was used to stain the cell nuclei (blue).

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