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Ambra1 Antibody

Catalog # ASC10675

Product Information

Application	WB, IF, E, IHC-P
Primary Accession	Q9C0C7
Other Accession	Q9C0C7, 166215833
Reactivity	Human, Mouse, Rat
Host	Rabbit
Clonality	Polyclonal
Isotype	IgG
Calculated MW	142507
Concentration (mg/ml)	1 mg/mL
Conjugate	Unconjugated
Application Notes	Ambra1 antibody can be used for the detection of Ambra1 by Western blot at 1 μg/mL. Antibody can also be used for immunohistochemistry starting at 5 μg/mL. For immunofluorescence start at 20 μg/mL.

Additional Information

Gene ID	55626
Other Names	Activating molecule in BECN1-regulated autophagy protein 1, AMBRA1, KIAA1736
Target/Specificity	AMBRA1;
Reconstitution & Storage	Ambra1 antibody can be stored at 4℃ for three months and -20℃, stable for up to one year. As with all antibodies care should be taken to avoid repeated freeze thaw cycles. Antibodies should not be exposed to prolonged high temperatures.
Precautions	Ambra1 Antibody is for research use only and not for use in diagnostic or therapeutic procedures.

Protein Information

Name	AMBRA1 {ECO:0000303|PubMed:17589504, ECO:0000312|HGNC:HGNC:25990}
Function	Substrate-recognition component of a DCX (DDB1-CUL4-X-box) E3 ubiquitin-protein ligase complex involved in cell cycle control and autophagy (PubMed:20921139, PubMed:23524951, PubMed:24587252, PubMed:32333458, PubMed:33854232, PubMed:33854235, PubMed:33854239). The DCX(AMBRA1) complex specifically mediates the polyubiquitination of target proteins such as BECN1, CCND1, CCND2, CCND3, ELOC and ULK1 (PubMed:23524951, PubMed:33854232, PubMed:33854235, PubMed:33854239). Acts as an upstream master regulator of the transition

	from G1 to S cell phase: AMBRA1 specifically recognizes and binds phosphorylated cyclin-D (CCND1, CCND2 and CCND3), leading to cyclin-D ubiquitination by the DCX(AMBRA1) complex and subsequent degradation (PubMed:33854232, PubMed:33854235, PubMed:33854239). By controlling the transition from G1 to S phase and cyclin-D degradation, AMBRA1 acts as a tumor suppressor that promotes genomic integrity during DNA replication and counteracts developmental abnormalities and tumor growth (PubMed:33854232, PubMed:33854235, PubMed:33854239). AMBRA1 also regulates the cell cycle by promoting MYC dephosphorylation and degradation independently of the DCX(AMBRA1) complex: acts via interaction with the catalytic subunit of protein phosphatase 2A (PPP2CA), which enhances interaction between PPP2CA and MYC, leading to MYC dephosphorylation and degradation (PubMed:25438055, PubMed:25803737). Acts as a regulator of Cul5-RING (CRL5) E3 ubiquitin- protein ligase complexes by mediating ubiquitination and degradation of Elongin-C (ELOC) component of CRL5 complexes (PubMed:25499913, PubMed:30166453). Acts as a key regulator of autophagy by modulating the BECN1-PIK3C3 complex: controls protein turnover during neuronal development, and regulates normal cell survival and proliferation (PubMed:21358617). In normal conditions, AMBRA1 is tethered to the cytoskeleton via interaction with dyneins DYNLL1 and DYNLL2 (PubMed:20921139). Upon autophagy induction, AMBRA1 is released from the cytoskeletal docking site to induce autophagosome nucleation by mediating ubiquitination of proteins involved in autophagy (PubMed:20921139). The DCX(AMBRA1) complex mediates 'Lys-63'-linked ubiquitination of BECN1, increasing the association between BECN1 and PIK3C3 to promote PIK3C3 activity (By similarity). In collaboration with TRAF6, AMBRA1 mediates 'Lys-63'-linked ubiquitination of ULK1 following autophagy induction, promoting ULK1 stability and kinase activity (PubMed:23524951). Also activates ULK1 via interaction with TRIM32: TRIM32 stimulates ULK1 through unanchored 'Lys-63'-linked polyubiquitin chains (PubMed:31123703). Also acts as an activator of mitophagy via interaction with PRKN and LC3 proteins (MAP1LC3A, MAP1LC3B or MAP1LC3C); possibly by bringing damaged mitochondria onto autophagosomes (PubMed:21753002, PubMed:25215947). Also activates mitophagy by acting as a cofactor for HUWE1; acts by promoting HUWE1- mediated ubiquitination of MFN2 (PubMed:30217973). AMBRA1 is also involved in regulatory T-cells (Treg) differentiation by promoting FOXO3 dephosphorylation independently of the DCX(AMBRA1) complex: acts via interaction with PPP2CA, which enhances interaction between PPP2CA and FOXO3, leading to FOXO3 dephosphorylation and stabilization (PubMed:30513302). May act as a regulator of intracellular trafficking, regulating the localization of active PTK2/FAK and SRC (By similarity). Also involved in transcription regulation by acting as a scaffold for protein complexes at chromatin (By similarity).
Cellular Location	Endoplasmic reticulum. Cytoplasm, cytoskeleton. Cytoplasmic vesicle, autophagosome {ECO:0000250|UniProtKB:A2AH22}. Mitochondrion. Cytoplasm, cytosol {ECO:0000250|UniProtKB:A2AH22}. Nucleus. Cell junction, focal adhesion {ECO:0000250|UniProtKB:A2AH22}. Note=Localizes to the cytoskeleton in absence of autophagy induction (PubMed:20921139). Upon autophagy induction, AMBRA1 relocalizes to the endoplasmic reticulum to enable autophagosome nucleation (PubMed:20921139). Partially localizes at mitochondria in normal conditions (PubMed:21358617). Also localizes to discrete punctae along the ciliary axoneme (By similarity) {ECO:0000250|UniProtKB:A2AH22, ECO:0000269|PubMed:20921139, ECO:0000269|PubMed:21358617}

Background

Ambra1 Antibody: Autophagy, the process of bulk degradation of cellular proteins through an

autophagosomic-lysosomal pathway is important for normal growth control and may be defective in tumor cells. It is involved in the preservation of cellular nutrients under starvation conditions as well as the normal turnover of cytosolic components. Beclin-1, a principal regulator of autophagosome formation, is in turn regulated by Ambra1. Ambra1 associates with Beclin-1 through a region near its center as determined by yeast two-hybrid assay. Null mutations in this gene in mice resulted in embryonic lethality with severe neural tube defects associated with autophagy impairment, accumulation of ubiquitinated proteins, unbalanced cell proliferation and excessive apoptotic death. Furthermore, down-regulation of Ambra1 in cultured cells though RNA interference decreased the level of rapamycin- and nutrient starvation-induced autophagy. Multiple isoforms of Ambra1 are known to exist.

References

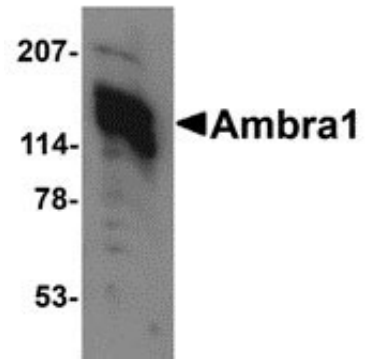
Gozuacik D and Kimchi A. Autophagy as a cell death and tumor suppressor mechanism. Oncogene2004; 23:2891-906.

Kisen GO, Tessitore L, Costelli P, et al. Reduced autophagic activity in primary rat hepatocellular carcinoma and ascites hepatoma cells. Carcinogenesis1993; 14:2501-5.

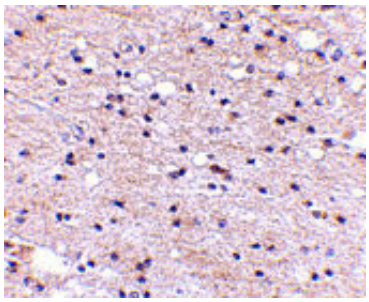
Liang XH, Jackson S, Seaman M, et al. Induction of autophagy and inhibition of tumorigenesis by beclin 1. Nature1999; 402:672-6.

Fimia GM, Stoykova A, Romagnoli A, et al. Ambra1 regulates autophagy and development of the nervous system. Nature2007; 447:1121-5.

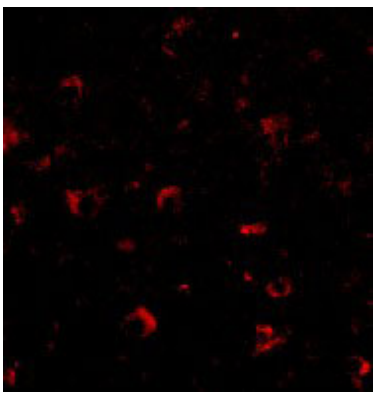
Images



Western blot analysis of Ambra1 in 3T3 cell lysate with Ambra1 antibody at 1 µg/mL.



Immunohistochemistry of Ambra1 in human brain with Ambra1 antibody at 5 µg/mL.



Immunofluorescence of Ambra1 in Human Brain cells with Ambra1 antibody at 20 µg/mL.

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