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ATG4A Antibody

Catalog # ASC11883

Product Information

Application	WB, E, IHC-P
Primary Accession	Q8WYN0
Other Accession	NP_443168, 30795252
Reactivity	Human, Mouse, Rat
Host	Rabbit
Clonality	Polyclonal
Isotype	IgG
Calculated MW	45378
Concentration (mg/ml)	1 mg/mL
Conjugate	Unconjugated
Application Notes	ATG4A antibody can be used for detection of ATG4A by Western blot at 1 - 2 g/ml. Antibody can also be used for immunohistochemistry starting at 5 g/mL.

Additional Information

Gene ID	115201
Other Names	Cysteine protease ATG4A, 3.4.22.-, AUT-like 2 cysteine endopeptidase, Autophagin-2, Autophagy-related cysteine endopeptidase 2, Autophagy-related protein 4 homolog A, hAPG4A, ATG4A, APG4A, AUTL2
Target/Specificity	ATG4A; ATG4A antibody is human, mouse and rat reactive. At least two isoforms of ATG4A are known to exist; this antibody will detect both isoforms. ATG4A is predicted to not cross-react with other ATG4 proteins.
Reconstitution & Storage	ATG4A antibody can be stored at 4℃ for three months and -20℃, stable for up to one year.
Precautions	ATG4A Antibody is for research use only and not for use in diagnostic or therapeutic procedures.

Protein Information

Name	ATG4A {ECO:0000303|Ref.20, ECO:0000312|HGNC:HGNC:16489}
Function	Cysteine protease that plays a key role in autophagy by mediating both proteolytic activation and delipidation of ATG8 family proteins (PubMed:12473658, PubMed:15169837, PubMed:17347651, PubMed:21177865, PubMed:21245471, PubMed:22302004, PubMed:32732290). The protease activity is required for proteolytic activation of ATG8 family proteins: cleaves the C-terminal amino acid of ATG8 proteins to reveal a C-terminal glycine (PubMed:12473658, PubMed:15169837, PubMed:17347651, PubMed:21177865, PubMed:21245471,

PubMed:22302004). Exposure of the glycine at the C-terminus is essential for ATG8 proteins conjugation to phosphatidylethanolamine (PE) and insertion to membranes, which is necessary for autophagy (PubMed:12473658, PubMed:15169837, PubMed:17347651, PubMed:21177865, PubMed:21245471, PubMed:22302004). Preferred substrate is GABARAPL2 followed by MAP1LC3A and GABARAP (PubMed:12473658, PubMed:15169837, PubMed:17347651, PubMed:21177865, PubMed:21245471, PubMed:22302004). Protease activity is also required to counteract formation of high-molecular weight conjugates of ATG8 proteins (ATG8ylation): acts as a deubiquitinating- like enzyme that removes ATG8 conjugated to other proteins, such as ATG3 (PubMed:31315929, PubMed:33773106). In addition to the protease activity, also mediates delipidation of ATG8 family proteins (PubMed:29458288, PubMed:33909989). Catalyzes delipidation of PE-conjugated forms of ATG8 proteins during macroautophagy (PubMed:29458288, PubMed:33909989). Compared to ATG4B, the major protein for proteolytic activation of ATG8 proteins, shows weaker ability to cleave the C-terminal amino acid of ATG8 proteins, while it displays stronger delipidation activity (PubMed:29458288). Involved in phagophore growth during mitophagy independently of its protease activity and of ATG8 proteins: acts by regulating ATG9A trafficking to mitochondria and promoting phagophore-endoplasmic reticulum contacts during the lipid transfer phase of mitophagy (PubMed:33773106).

Cellular Location Cytoplasm {ECO:0000250|UniProtKB:Q8BGE6}.

Background

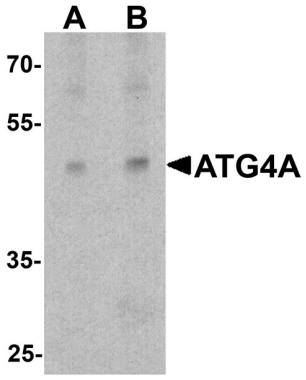
Autophagy, the process of bulk degradation of cellular proteins through an autophagosomic-lysosomal pathway is important for normal growth control and may be defective in tumor cells. It is involved in the preservation of cellular nutrients under starvation conditions as well as the normal turnover of cytosolic components (1,2). ATG4A, also known as AUTL2, is one of four mammalian orthologs of the yeast ATG4 protein; all four are cysteine proteases (3). ATG4 is required for ATG8 conjugation to phosphatidylethanolamine on autophagosomal membranes. In mammals, each ATG4 homolog shows a selective preference for the ATG8 homologs (4).

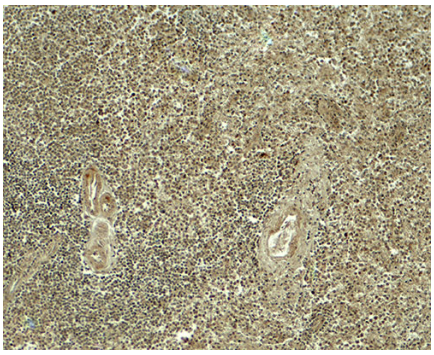
References

Gozuacik D and Kimchi A. Autophagy as a cell death and tumor suppressor mechanism. Oncogene 2004; 23:2891-906.
Kisen GO, Tessitore L, Costelli P, et al. Reduced autophagic activity in primary rat hepatocellular carcinoma and ascites hepatoma cells. Carcinogenesis 1993; 14:2501-5.
Marino G, Uria JA, Puente XS, et al. Human autophagins, a family of cysteine proteinases potentially implicated in cell degradation by autophagy. J. Biol. Chem. 2003; 278:3671-8.
Li M, Hou Y, Wang J, et al. Kinetic comparisons of mammalian Atg4 homologues indicate selective preferences towards diverse Atg8 substrates. J. Biol. Chem. 2011; 286:7327-38.

Images

Western blot analysis of ATG4A in EL4 cell lysate with ATG4A antibody at (A) 1 and (B) 2 µg/ml.





Immunohistochemistry of ATG4A in human spleen tissue with ATG4A antibody at 5 µg/ml.