10320 Camino Santa Fe, Suite G
San Diego, CA 92121
Tel: 858.875.1900 Fax: 858.875.1999

Cleaved LC3A Antibody

Affinity Purified Rabbit Polyclonal Antibody (Pab)
Catalog # AP1805a

Product Information

Application	WB, IHC-P, IF, ICC, E
Primary Accession	Q9H492, Q9GZQ8
Other Accession	Q62625, Q9CQV6, O41515, Q6XVN8, Q91VR7, Q2HJ23
Reactivity	Human, Mouse
Predicted	Rat, Bovine, Canine, Rabbit, Chicken
Host	Rabbit
Clonality	Polyclonal
Isotype	Rabbit IgG
Calculated MW	14272
Antigen Region	89-120

Additional Information

Gene ID	84557
Other Names	Microtubule-associated proteins 1A/1B light chain 3A, Autophagy-related protein LC3 A, Autophagy-related ubiquitin-like modifier LC3 A, MAP1 light chain 3-like protein 1, MAP1A/MAP1B light chain 3 A, MAP1A/MAP1B LC3 A, Microtubule-associated protein 1 light chain 3 alpha, MAP1LC3A
Target/Specificity	This Cleaved LC3A antibody is generated from rabbits immunized with a KLH conjugated synthetic peptide between 89-120 amino acids from human Cleaved LC3A or LC3B.
Dilution	WB~~1:500 IHC-P~~1:100~500 IF~~1:100 ICC~~1:10~50 E~~Use at an assay dependent concentration.
Format	Purified polyclonal antibody supplied in PBS with 0.09% (W/V) sodium azide. This antibody is purified through a protein A column, followed by peptide affinity purification.
Storage	Maintain refrigerated at 2-8°C for up to 2 weeks. For long term storage store at -20°C in small aliquots to prevent freeze-thaw cycles.
Precautions	Cleaved LC3A Antibody is for research use only and not for use in diagnostic or therapeutic procedures.

Protein Information

Name	MAP1LC3A

Function	Ubiquitin-like modifier involved in formation of autophagosomal vacuoles (autophagosomes) (PubMed:20713600, PubMed:24290141). While LC3s are involved in elongation of the phagophore membrane, the GABARAP/GATE-16 subfamily is essential for a later stage in autophagosome maturation (PubMed:20713600). Through its interaction with the reticulophagy receptor TEX264, participates in the remodeling of subdomains of the endoplasmic reticulum into autophagosomes upon nutrient stress, which then fuse with lysosomes for endoplasmic reticulum turnover (PubMed:31006537, PubMed:31006538).
Cellular Location	Cytoplasmic vesicle, autophagosome membrane; Lipid-anchor. Endomembrane system; Lipid-anchor. Cytoplasm, cytoskeleton {ECO:0000250|UniProtKB:Q91VR7}. Note=LC3-II binds to the autophagic membranes.
Tissue Location	Most abundant in heart, brain, liver, skeletal muscle and testis but absent in thymus and peripheral blood leukocytes

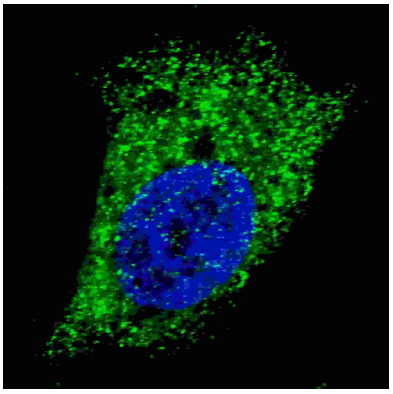
Background

Macroautophagy is the major inducible pathway for the general turnover of cytoplasmic constituents in eukaryotic cells, it is also responsible for the degradation of active cytoplasmic enzymes and organelles during nutrient starvation. Macroautophagy involves the formation of double-membrane bound autophagosomes which enclose the cytoplasmic constituent targeted for degradation in a membrane bound structure, which then fuse with the lysosome (or vacuole) releasing a single-membrane bound autophagic bodies which are then degraded within the lysosome (or vacuole). MAP1A and MAP1B are microtubule-associated proteins which mediate the physical interactions between microtubules and components of the cytoskeleton. These proteins are involved in formation of autophagosomal vacuoles (autophagosomes). MAP1A and MAP1B each consist of a heavy chain subunit and multiple light chain subunits. MAP1LC3a is one of the light chain subunits and can associate with either MAP1A or MAP1B. The precursor molecule is cleaved by APG4B/ATG4B to form the cytosolic form, LC3-I. This is activated by APG7L/ATG7, transferred to ATG3 and conjugated to phospholipid to form the membrane-bound form, LC3-II.

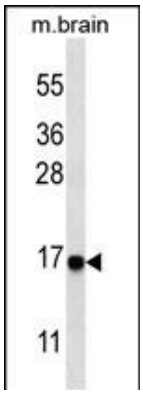
References

References for protein:
1.Baehrecke EH. Nat Rev Mol Cell Biol. 6(6):505-10. (2005)
2.Lum JJ, et al. Nat Rev Mol Cell Biol. 6(6):439-48. (2005)
3.Greenberg JT. Dev Cell. 8(6):799-801. (2005)
4. Levine B. Cell. 120(2):159-62. (2005)
5.Shintani T and Klionsky DJ. Science. 306(5698):990-5. (2004)
6.Tanida I., et al. Int. J. Biochem. Cell Biol. 36:2503-2518(2004)
7.He H., et al. J. Biol. Chem. 278:29278-29287(2003)
8.Tanida I., et al. J. Biol. Chem. 279:36268-36276(2004)
References for U251 cell line:
1. Westermark B.; Pontén J.; Hugosson R. (1973).” Determinants for the establishment of permanent tissue culture lines from human gliomas”. Acta Pathol Microbiol Scand A. 81:791-805. [PMID: 4359449].
2. Pontén, J.,Westermark B. (1978).” Properties of Human Malignant Glioma Cells in Vitro”. Medical Biology 56: 184-193.[PMID: 359950].
3. Geng Y.;Kohli L.; Klocke B.J.; Roth K.A.(2010). “Chloroquine-induced autophagic vacuole accumulation and cell death in glioma cells is p53 independent”. Neuro Oncol. 12(5): 473–481.[PMID: 20406898].

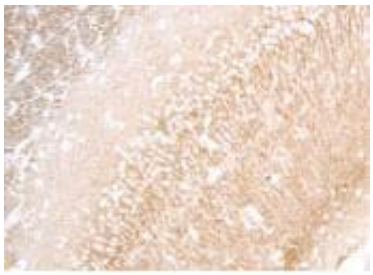
Images



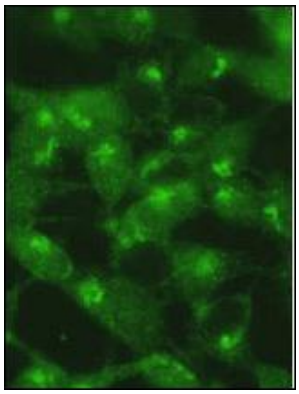
Fluorescent image of U251 cells stained with cleaved LC3A antibody. U251 cells were fixed with 4% PFA (20 min), permeabilized with Triton X-100 (0.2%, 30 min). Cells were then incubated with AP1805a cleaved LC3A primary antibody (1:100, 2 h at room temperature). For secondary antibody, Alexa Fluor® 488 conjugated donkey anti-rabbit antibody (green) was used (1:1000, 1h). Nuclei were counterstained with Hoechst 33342 (blue) (10 µg/ml, 5 min). LC3 immunoreactivity is localized to autophagic vacuoles in the cytoplasm of U251 cells.



Western blot analysis of anti-cleaved-LC3 (APG8a) Pab (Cat. #AP1805a) in mouse brain tissue lysate. Cleaved-LC3 (APG8a) was detected using the purified Pab.



Formalin-fixed and paraffin-embedded human cancer tissue reacted with the primary antibody, which was peroxidase-conjugated to the secondary antibody, followed by DAB staining. This data demonstrates the use of this antibody for immunohistochemistry; clinical relevance has not been evaluated. BC = breast carcinoma; HC = hepatocarcinoma.



5Y cells were pretreated with 5nM bafilomycin for 24hr and fixed in 4% of paraformaldehyde. Treatment with Cat# AP1805a antibody at dilution 1:100. Data courtesy of Jianhui Zhu, MD, PhD & Charleen T. Chu, MD, PhD, University of Pittsburgh School of Medicine.

Citations

- Hyperglycemia alters mitochondrial respiration efficiency and mitophagy in human podocytes
- The dynamic interplay between ATP/ADP levels and autophagy sustain neuronal migration in vivo
- Identification of the autophagy pathway in a mollusk bivalve, Crassostrea gigas
- Patterns of LC3A Autophagy Protein Expression in Keratoacanthomas.
- Three-Dimensional Organoids Reveal Therapy Resistance of Esophageal and Oropharyngeal Squamous Cell Carcinoma Cells.
- Tumor autophagy is associated with survival outcomes in patients with resected non-small cell lung cancer.
- Patterns of autophagy in urothelial cell carcinomas--the significance of "stone-like" structures (SLS) in transurethral resection biopsies.
- The gluttonous side of malignant melanoma: basic and clinical implications of macroautophagy.

- Autophagy patterns and prognosis in uveal melanomas.
- Beclin-1 and LC3A expression in cutaneous malignant melanomas: a biphasic survival pattern for beclin-1.
- LC3A-positive "stone-like" structures in cutaneous squamous cell carcinomas.
- Lung autophagic response following exposure of mice to whole body irradiation, with and without amifostine.
- Prognostic relevance of light chain 3 (LC3A) autophagy patterns in colorectal adenocarcinomas.
- LC3A-positive light microscopy detected patterns of autophagy and prognosis in operable breast carcinomas.
- Autophagy in endometrial carcinomas and prognostic relevance of 'stone-like' structures (SLS): what is destined for the atypical endometrial hyperplasia?
- LC3 immunostaining pitfalls.
- Overexpression of LC3A autophagy protein in follicular and diffuse large B-cell lymphomas.
- Inhibition of the host translation shutoff response by herpes simplex virus 1 triggers nuclear envelope-derived autophagy.
- Autophagy and Bcl-2/BNIP3 death regulatory pathway in non-small cell lung carcinomas.
- Low expression of ULK1 is associated with operable breast cancer progression and is an adverse prognostic marker of survival for patients.
- Immunohistochemical analysis of macroautophagy: recommendations and limitations.
- "Autophagic flux" in normal mouse tissues: focus on endogenous LC3A processing.
- Depletion of the ubiquitin-binding adaptor molecule SQSTM1/p62 from macrophages harboring cftr □'F508 mutation improves the delivery of Burkholderia cenocepacia to the autophagic machinery.
- Autophagy proteins in prostate cancer: Relation with anaerobic metabolism and Gleason score.
- Autophagy stimulation by rapamycin suppresses lung inflammation and infection by Burkholderia cenocepacia in a model of cystic fibrosis.
- Pancreatic cancers require autophagy for tumor growth.
- A bacterial protein promotes the recognition of the Legionella pneumophila vacuole by autophagy.
- IFN-γ Stimulates Autophagy-Mediated Clearance of Burkholderia cenocepacia in Human Cystic Fibrosis Macrophages.
- Chaperone molecules concentrate together with the ubiquitin-proteasome system inside particulate cytoplasmic structures: possible role in metabolism of misfolded proteins.
- Particulate cytoplasmic structures with high concentration of ubiquitin-proteasome accumulate in myeloid neoplasms.
- Mineralocorticoid receptor antagonism induces browning of white adipose tissue through impairment of autophagy and prevents adipocyte dysfunction in high-fat-diet-fed mice.
- Autophagy levels are elevated in barrett\'s esophagus and promote cell survival from acid and oxidative stress.
- Increased expression of transcription factor EB (TFEB) is associated with autophagy, migratory phenotype and poor prognosis in non-small cell lung cancer.
- AR-13 reduces antibiotic-resistant bacterial burden in cystic fibrosis phagocytes and improves cystic fibrosis transmembrane conductance regulator function.
- Defective lysosomal clearance of autophagosomes and its clinical implications in nonalcoholic steatohepatitis.
- Inhibition of excessive autophagy and mitophagy mediates neuroprotective effects of URB597 against chronic cerebral hypoperfusion.
- Autophagy dysregulation caused by ApoM deficiency plays an important role in liver lipid metabolic disorder.
- Cysteamine-mediated clearance of antibiotic-resistant pathogens in human cystic fibrosis macrophages.
- Three-dimensional tumor cell growth stimulates autophagic flux and recapitulates chemotherapy resistance.
- Standard Immunohistochemical Assays to Assess Autophagy in Mammalian Tissue.
- Inhibition of autophagy protein LC3A as a therapeutic target in ovarian clear cell carcinomas.
- Vitamin D receptor regulates autophagy in the normal mammary gland and in luminal breast cancer cells.
- LC3A-positive
- Transcription Factor EB Expression in Early Breast Cancer Relates to Lysosomal/Autophagosomal Markers and Prognosis.
- ALDH2 modulates autophagy flux to regulate acetaldehyde-mediated toxicity thresholds.
- Lipophagy-ICAM-1 pathway associated with fatty acid and oxygen deficiencies is involved in poor prognoses of ovarian clear cell carcinoma
- Capsaicin binds the N-terminus of Hsp90, induces lysosomal degradation of Hsp70, and enhances the anti-tumor effects of 17-AAG (Tanespimycin)

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