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LC3 Antibody (APG8B) (N-term)

Purified Rabbit Polyclonal Antibody (Pab)
Catalog # AP1802A

Product Information

Application	WB, IHC-P, IF, E
Primary Accession	Q9GZQ8
Other Accession	A6NCE7, O41515
Reactivity	Human, Mouse, Rat
Predicted	Bovine, Canine, Chicken
Host	Rabbit
Clonality	Polyclonal
Isotype	Rabbit IgG
Calculated MW	14688
Antigen Region	1-30

Additional Information

Gene ID	81631
Other Names	Microtubule-associated proteins 1A/1B light chain 3B, Autophagy-related protein LC3 B, Autophagy-related ubiquitin-like modifier LC3 B, MAP1 light chain 3-like protein 2, MAP1A/MAP1B light chain 3 B, MAP1A/MAP1B LC3 B, Microtubule-associated protein 1 light chain 3 beta, MAP1LC3B, MAP1ALC3
Target/Specificity	This LC3 antibody is generated from rabbits immunized with a KLH conjugated synthetic peptide between 1-30 amino acids from the N-terminal region of human LC3.
Dilution	WB~~1:1000 IHC-P~~1:100~500 IF~~1:25 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	LC3 Antibody (APG8B) (N-term) is for research use only and not for use in diagnostic or therapeutic procedures.

Protein Information

Name	MAP1LC3B (HGNC:13352)

Synonyms	MAP1ALC3
Function	Ubiquitin-like modifier involved in formation of autophagosomal vacuoles (autophagosomes) (PubMed:20418806, PubMed:23209295, PubMed:28017329). Plays a role in mitophagy which contributes to regulate mitochondrial quantity and quality by eliminating the mitochondria to a basal level to fulfill cellular energy requirements and preventing excess ROS production (PubMed:23209295, PubMed:28017329). In response to cellular stress and upon mitochondria fission, binds C-18 ceramides and anchors autophagolysosomes to outer mitochondrial membranes to eliminate damaged mitochondria (PubMed:22922758). 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:20418806, PubMed:23209295, PubMed:28017329). Promotes primary ciliogenesis by removing OFD1 from centriolar satellites via the autophagic pathway (PubMed:24089205). 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). Upon nutrient stress, directly recruits cofactor JMY to the phagophore membrane surfaces and promotes JMY's actin nucleation activity and autophagosome biogenesis during autophagy (PubMed:30420355).
Cellular Location	Cytoplasmic vesicle, autophagosome membrane; Lipid-anchor Endomembrane system; Lipid-anchor Mitochondrion membrane; Lipid-anchor. Cytoplasm, cytoskeleton {ECO:0000250|UniProtKB:Q9CQV6}. Cytoplasmic vesicle. Note=LC3-II binds to the autophagic membranes. LC3-II localizes with the mitochondrial inner membrane during Parkin-mediated mitophagy (PubMed:28017329). Also localizes to discrete punctae along the ciliary axoneme
Tissue Location	Most abundant in heart, brain, skeletal muscle and testis. Little expression observed in liver

Background

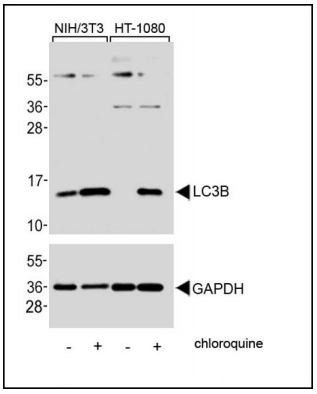
Macroautophagy is the major inducible pathway for the general turnover of cytoplasmic constituents in eukaryotic cells, it is also responsible for the degradation of active cytoplasmic enzymes and organelles during nutrient starvation. Macroautophagy involves the formation of double-membrane bound autophagosomes 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. MAP1LC3b 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

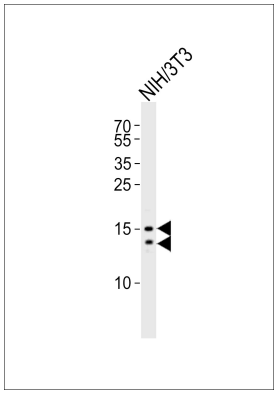
References for protein:
1.Baehrecke EH. Nat Rev Mol Cell Biol. 6(6):505-10. (2005)
2.Lum JJ, et al. Nat Rev Mol Cell Biol. 6(6):439-48. (2005)
3.Greenberg JT. Dev Cell. 8(6):799-801. (2005)
4.Levine B. Cell. 120(2):159-62. (2005)

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].

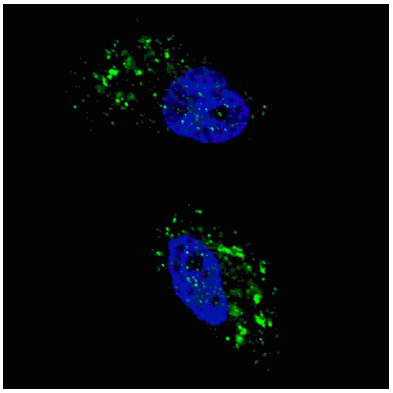
Images



Western blot analysis of lysates from NIH/3T3, HT-1080 cell line, untreated or treated with chloroquine, 50µM, using LC3 Antibody (APG8B) (Cat. #AP1802a)(upper) or GAPDH(lower).

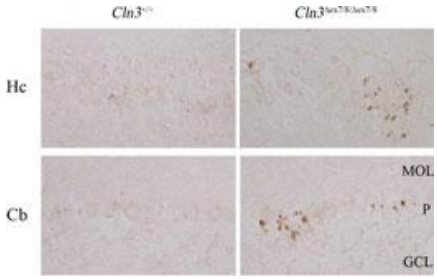


Western blot analysis of lysate from mouse NIH/3T3 cell line, using LC3 Antibody (APG8B) (N-term)(Cat. #AP1802a). AP1802a was diluted at 1:1000. A goat anti-rabbit IgG H&L(HRP) at 1:10000 dilution was used as the secondary antibody. Lysate at 20ug.



Fluorescent image of U251 cells stained with LC3 (APG8B) (N-term) antibody. U251 cells were treated with Chloroquine (50 µM,16h), then fixed with 4% PFA (20 min), permeabilized with Triton X-100 (0.2%, 30 min). Cells were then incubated with AP1801i LC3 (Isoform B Specific) 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.

Wild-type (Cln3+/+) or homozygous Cln3 □ex7/8 (Cln3 □ex7/8/ □ex7/8) paraffin-embedded brain sections immunostained for the LC3 protein (Cat. # AP1802a LC3 antibody). Shown are the CA2/CA3 region of



hippocampus (Hc) and cerebellum (Cb) from 10-month-old mice. Few immunopositive puncta are present in wild-type sections, whereas homozygous Cln3 □ex7/8 sections contain clusters of LC3-positive puncta around pyramidal neurons and Purkinje cells (P). MOL, molecular layer; GCL, granule cell layer. Data courtesy of Dr. Susan Cotman, Massachusets General Hospital.

Citations

- Dependence on Autophagy for Autoreactive Memory B Cells in the Development of Pristane-Induced Lupus
- NBM-BMX, an HDAC8 Inhibitor, Overcomes Temozolomide Resistance in Glioblastoma Multiforme by Downregulating the β-Catenin/c-Myc/SOX2 Pathway and Upregulating p53-Mediated MGMT Inhibition
- The MAP Kinase Phosphatase MKP-1 Modulates Neurogenesis via Effects on BNIP3 and Autophagy
- Ionizing Radiation Induces Resistant Glioblastoma Stem-Like Cells by Promoting Autophagy via the Wnt/β-Catenin Pathway
- Uncoupling endosomal CLC chloride/proton exchange causes severe neurodegeneration
- Innate immune receptor NOD2 mediates LGR5 intestinal stem cell protection against ROS cytotoxicity via mitophagy stimulation
- Flavopereirine Inhibits Hepatocellular Carcinoma Cell Growth by Inducing Cell-cycle Arrest, Apoptosis, and Autophagy-related Protein Expression
- Downregulation of ATP13A2 in midbrain dopaminergic neurons is related to defective autophagy in a mouse model of Parkinson's disease
- L-3-n-Butylphthalide improves synaptic and dendritic spine plasticity and ameliorates neurite pathology in Alzheimer's disease mouse model and cultured hippocampal neurons
- Rapamycin induces megakaryocytic differentiation through increasing autophagy in Dami cells
- Piperlongumine induces autophagy in biliary cancer cells via reactive oxygen species-activated Erk signaling pathway.
- The dual PI3K/mTOR inhibitor BEZ235 restricts the growth of lung cancer tumors regardless of EGFR status, as a potent accompanist in combined therapeutic regimens.
- Protective effect of potassium 2-(l-hydroxypentyl)-benzoate on hippocampal neurons, synapses and dystrophic axons in APP/PS1 mice.
- Axonal autophagosome maturation defect through failure of ATG9A sorting underpins pathology in AP-4 deficiency syndrome.
- Antimycin A-Induced Mitochondrial Damage Causes Human RPE Cell Death despite Activation of Autophagy.
- Thioridazine Enhances P62-Mediated Autophagy and Apoptosis Through Wnt/β-Catenin Signaling Pathway in Glioma Cells.
- Anti-Invasion and Antiangiogenic Effects of Stellettin B through Inhibition of the Akt/Girdin Signaling Pathway and VEGF in Glioblastoma Cells.
- Epidermal growth factor receptor promotes cerebral and retinal invasion by Toxoplasma gondii.
- Benzyl isothiocyanate induces protective autophagy in human prostate cancer cells via inhibition of mTOR signaling.
- Dengue virus infection induces autophagy: an in vivo study.
- Hydroquinone induces oxidative and mitochondrial damage to human retinal M □4ller cells (MIO-M1).
- Mutant tristetraprolin: a potent inhibitor of malignant glioma cell growth.
- Induction of autophagy by Imatinib sequesters Bcr-Abl in autophagosomes and down-regulates Bcr-Abl protein.
- Detection of the HIV-1 minus-strand-encoded antisense protein and its association with autophagy.
- Inhibition of Intracellular Clusterin Attenuates Cell Death in Nephropathic Cystinosis.
- (+)-Epogymnolactam, a novel autophagy inducer from mycelial culture of Gymnopus sp.
- Active ras triggers death in glioblastoma cells through hyperstimulation of macropinocytosis.
- Janus-faced liposomes enhance antimicrobial innate immune response in Mycobacterium tuberculosis infection.
- X-linked myotubular myopathy in Rottweiler dogs is caused by a missense mutation in Exon 11 of the MTM1 gene.
- Myocardin is required for maintenance of vascular and visceral smooth muscle homeostasis during postnatal development.
- Identification of thioridazine, an antipsychotic drug, as an antiglioblastoma and anticancer stem cell agent using public gene expression data.
- Activation of autophagy in rat brain cells following focal cerebral ischemia reperfusion through enhanced expression of Atg1/pULK and LC3.
- Cell killing and radiosensitizing effects of atorvastatin in PC3 prostate cancer cells.
- 4-Hydroxytamoxifen induces autophagic death through K-Ras degradation.
- Requirement for autophagy in the long-term persistence but not initial formation of memory B cells.
- Neutrophils counteract autophagy-mediated anti-inflammatory mechanisms in alveolar macrophage: role in posthemorrhagic shock acute lung inflammation.
- Phospholipase D2 mediates survival signaling through direct regulation of Akt in glioblastoma cells.
- Transcription factor IKZF1 is degraded during apoptosis of multiple myeloma cells induced by kinase inhibition.
- Lipoxin A4 methyl ester alleviates vascular cognition impairment by regulating the expression of proteins related to

autophagy and ER stress in the rat hippocampus.
- LC3B globular structures correlate with survival in esophageal adenocarcinoma.
- Involvement of autophagy in oncogenic K-Ras-induced malignant cell transformation.
- Effect of pantoprazole to enhance activity of docetaxel against human tumour xenografts by inhibiting autophagy.
- Upregulation of cell surface estrogen receptor alpha is associated with the mitogen-activated protein kinase/extracellular signal-regulated kinase activity and promotes autophagy maturation.
- Changes in microtubule-related proteins and autophagy in long-term vitamin E-deficient mice.
- A mutation in the Warburg syndrome gene, RAB3GAP1, causes a similar syndrome with polyneuropathy and neuronal vacuolation in Black Russian Terrier dogs.
- Antiretrovirals, Methamphetamine, and HIV-1 Envelope Protein gp120 Compromise Neuronal Energy Homeostasis in Association with Various Degrees of Synaptic and Neuritic Damage.
- Effect of hydroxychloroquine and characterization of autophagy in a mouse model of endometriosis.
- Far-infrared promotes burn wound healing by suppressing NLRP3 inflammasome caused by enhanced autophagy.
- Iron mitigates DMT1-mediated manganese cytotoxicity via the ASK1-JNK signaling axis: Implications of iron supplementation for manganese toxicity.
- IKKβ/NFκBp65 activated by interleukin-13 targets the autophagy-related genes LC3B and beclin 1 in fibroblasts co-cultured with breast cancer cells.
- Diesel exhaust particles induce autophagy and citrullination in Normal Human Bronchial Epithelial cells.
- The interrelationship between phagocytosis, autophagy and formation of neutrophil extracellular traps following infection of human neutrophils by Streptococcus pneumoniae.
- Iraqi propolis increases degradation of IL-1β and NLRC4 by autophagy following Pseudomonas aeruginosa infection.
- Genistein and Myd88 Activate Autophagy in High Glucose-Induced Renal Podocytes In Vitro.
- Neuromelanin organelles are specialized autolysosomes that accumulate undegraded proteins and lipids in aging human brain and are likely involved in Parkinson's disease.
- Ubiquitination of the Cytoplasmic Domain of Influenza A Virus M2 Protein is Crucial for Production of Infectious Virus Particles.
- Histone deacetylase inhibition of cardiac autophagy in rats on a high □fat diet with low □dose streptozotocin-induced type 2 diabetes mellitus.
- The roles of autophagy and hypoxia in human inflammatory periapical lesions.
- Ghrelin protects small intestinal epithelium against sepsis-induced injury by enhancing the autophagy of intestinal epithelial cells.
- The autophagy pathway participates in resistance to tomato yellow leaf curl virus infection in whiteflies.
- Inhibition of Isoprenylcysteine carboxylmethyltransferase induces cell cycle arrest and apoptosis through p21 and p21-regulated BNIP3 induction in pancreatic cancer.
- Deletion of the BH3-only protein Noxa alters electrographic seizures but does not protect against hippocampal damage after status epilepticus in mice.
- Disruption of endolysosomal trafficking pathways in glioma cells by methuosis-inducing indole-based chalcones.
- Low expression of MAP1LC3B, associated with low Beclin-1, predicts lymph node metastasis and poor prognosis of gastric cancer.
- Exocytosis of varicella-zoster virions involves a convergence of endosomal and autophagy pathways.
- Combination of the novel histone deacetylase inhibitor YCW1 and radiation induces autophagic cell death through the downregulation of BNIP3 in triple-negative breast cancer cells in vitro and in an orthotopic mouse model.
- Autophagy generates citrullinated peptides in human synoviocytes: a possible trigger for anti-citrullinated peptide antibodies.
- Autophagy activation is involved in neuroprotection induced by hyperbaric oxygen preconditioning against focal cerebral ischemia in rats.
- A novel quantitative flow cytometry-based assay for autophagy.
- Melatonin attenuates methamphetamine-induced deactivation of the mammalian target of rapamycin signaling to induce autophagy in SK-N-SH cells.
- Impaired autophagy by soluble endoglin, under physiological hypoxia in early pregnant period, is involved in poor placentation in preeclampsia.
- Autophagy enhances the presentation of endogenous viral antigens on MHC class I molecules during HSV-1 infection.
- A rapid method to improve protein detection by indirect ELISA.
- Chronic autophagy is a cellular adaptation to tumor acidic pH microenvironments.
- Autophagy is disrupted in a knock-in mouse model of juvenile neuronal ceroid lipofuscinosis.
- Ras-related tumorigenesis is suppressed by BNIP3-mediated autophagy through inhibition of cell proliferation.
- Beclin 1 knockdown inhibits autophagic activation and prevents the secondary neurodegenerative damage in the ipsilateral thalamus following focal cerebral infarction.
- Radiation sensitization of glioblastoma by cilengitide has unanticipated schedule-dependency.

- The stent-eluting drugs sirolimus and paclitaxel suppress healing of the endothelium by induction of autophagy.
- Adenovirus RID-alpha activates an autonomous cholesterol regulatory mechanism that rescues defects linked to Niemann-Pick disease type C.
- Lysosomal degradation of endocytosed proteins depends on the chloride transport protein ClC-7.
- Maintenance of HCT116 colon cancer cell line conforms to a stochastic model but not a cancer stem cell model.
- NOD2 stimulation induces autophagy in dendritic cells influencing bacterial handling and antigen presentation.
- The IKK complex contributes to the induction of autophagy.
- ISG20L1 is a p53 family target gene that modulates genotoxic stress-induced autophagy.

- Lysosome dysfunction triggers Atg7-dependent neural apoptosis.

- A highly toxic cellular prion protein induces a novel, nonapoptotic form of neuronal death.
- p62/sequestosome 1 as a regulator of proteasome inhibitor-induced autophagy in human retinal pigment epithelial cells.
- Influence of Hsp90 and HDAC inhibition and tubulin acetylation on perinuclear protein aggregation in human retinal pigment epithelial cells.
- Invasion and multiplication of Helicobacter pylori in gastric epithelial cells and implications for antibiotic resistance.
- Rab5 and class III phosphoinositide 3-kinase Vps34 are involved in hepatitis C virus NS4B-induced autophagy.
- Tocotrienols prevent hydrogen peroxide-induced axon and dendrite degeneration in cerebellar granule cells.
- Macroautophagy is defective in mucolipin-1-deficient mouse neurons.
- HDAC5 is required for maintenance of pericentric heterochromatin, and controls cell-cycle progression and survival of human cancer cells.
- Increased hippocampal accumulation of autophagosomes predicts short-term recognition memory impairment in aged mice.
- Changes in autophagy after traumatic brain injury.
- Caspase-6 activity in a BACHD mouse modulates steady-state levels of mutant huntingtin protein but is not necessary for production of a 586 amino acid proteolytic fragment.
- Combination treatment with arsenic trioxide and irradiation enhances cell-killing effects in human fibrosarcoma cells in vitro and in vivo through induction of both autophagy and apoptosis.
- 9-O-Terpenyl-Substituted Berberrubine Derivatives Suppress Tumor Migration and Increase Anti-Human Non-Small-Cell Lung Cancer Activity
- Maternal Bisphenol A (BPA) Exposure Alters Cerebral Cortical Morphogenesis and Synaptic Function in Mice
- BNIP3-mediated mitophagy boosts the competitive growth of Lenvatinib-resistant cells via energy metabolism reprogramming in HCC

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