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Product Information

Anti-Atg7
produced in rabbit, affinity isolated antibody

Catalog Number **A2856**

Product Description

Anti-Atg7 is produced in rabbit using as immunogen a synthetic peptide corresponding to amino acids 38-50 of human Atg7 (GeneID: 10533), conjugated to KLH via a C-terminal cysteine residue. The corresponding sequence is identical in mouse and rat. The antibody is affinity-purified using the immunizing peptide immobilized on agarose.

Anti-Atg7 recognizes human, mouse, and rat Atg7 by immunoblotting (~75 kDa) and immunoprecipitation. Detection of the Atg7 band by immunoblotting is specifically inhibited with the immunizing peptide.

Macroautophagy, usually referred to as autophagy, is a major pathway for bulk degradation of cytoplasmic constituents and organelles. In this process, portions of the cytoplasm are sequestered into double membrane vesicles, the autophagosomes, and subsequently delivered to the lysosome for degradation and recycling.[1,2] Although autophagy is a constitutive cellular event, it is enhanced under certain conditions such as starvation, hormonal stimulation, and drug treatments.[3] Autophagy is required for normal turnover of cellular components during starvation. It plays an essential role in cellular differentiation, cell death, and aging. Defective autophagy may contribute to certain human diseases such as cancer, neurodegenerative diseases, muscular disorders, and pathogen infections.[4,5]

Autophagy is an evolutionarily conserved pathway seen in all eukaryotic cells.[1] At least 16 ATG genes required for autophagosome formation were identified in yeast by genetic screens. For many of these genes, related homologs have been identified in mammals.[6] Two ubiquitin-like conjugation systems are involved in autophagosome formation: Atg12 and Atg8 conjugation systems. The ubiquitin-like proteins Atg12 and Atg8 are activated by Atg7, an E1-like enzyme essential for both conjugation systems. Atg12 is then transferred to Atg10, an E2-like enzyme, and conjugated to Atg5, whereas Atg8 is transferred to Atg3, another E2-like enzyme, followed by conjugation to phosphatidylethanolamine.

Atg7 can activate all three Atg8 mammalian homologues, GATE-16, GABARAP, and LC3. It forms a homodimer via the C-terminal region that is important for enzyme-substrate interaction and E1-E2 complex formation.[7-9]

Atg7 was found to be essential for amino acid supply in neonates and starvation–induced bulk degradation of proteins and organelles in mice. Loss of Atg7 results in the accumulation of abnormal organelles and ubiquitin-positive aggregates, and leads to neurodegeneration.[9,10]

Reagent

Supplied as a solution in 0.01 M phosphate buffered saline, pH 7.4, containing 15 mM sodium azide as a preservative.

Antibody concentration: ~1.0 mg/mL

Precautions and Disclaimer

For R&D use only. Not for drug, household, or other uses. Please consult the Safety Data Sheet for information regarding hazards and safe handling practices.

Storage/Stability

For continuous use, store at 2–8 °C for up to one month. For extended storage, freeze in working aliquots. Repeated freezing and thawing, or storage in "frost-free" freezers, is not recommended. If slight turbidity occurs upon prolonged storage, clarify the solution by centrifugation before use. Working dilutions should be discarded if not used within 12 hours.

Product Profile

Immunoblotting: a working concentration of 0.5–1 μg/mL is recommended using whole extracts of mouse 3T3 cells.

Immunoprecipitation: a working amount of 1–2 μL is recommended using human U87 cell lysates.

Note: In order to obtain the best results in various techniques and preparations, it is recommended to determine the optimal working dilution by titration.

References

1. Klionsky, D.J., and Emr, S.D., *Science*, **290**, 1717-1721 (2000).
2. Kuma, A. et al., *Nature*, **432**, 1032-1036 (2004).
3. Kabeya, Y. et al., *EMBO J*., **19**, 5720-5728 (2000).
4. Reggiori, F., and Klionsky, D.J., *Eukaryotic Cell*, **1**, 11-21 (2002).
5. Shintani, T., and Klionsky, D.J., *Science*, **306**, 990-995 (2004).
6. Klionsky, D.J. et al., *Develop. Cell*, **5**, 539-545 (2003).
7. Tanida, I. et al., *J. Biol*. *Chem*., **276**, 1701-1706 (2001).
8. Komatsu, M. et al., *J. Biol. Chem.*, **276**, 9846-9854 (2001).
9. Komatsu, M. et al., *J. Cell Biol*., **169**, 425-434 (2005).
10. Komatsu, M. et al., *Nature*, **441**, 880-884 (2006).

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