3050 Spruce Street, St. Louis, MO 63103 USA
Tel: (800) 521-8956 (314) 771-5765 Fax: (800) 325-5052 (314) 771-5757
email: techservice@sial.com sigma-aldrich.com

Product Information

Monoclonal Anti-Atg7, clone ATG7-13
produced in mouse, purified immunoglobulin

Catalog Number **SAB4200304**

Product Description

Monoclonal Anti-Atg7 (mouse IgG1 isotype) is derived from the hybridoma ATG7-13 produced by the fusion of mouse myeloma cells and splenocytes from BALB/c mice immunized with a synthetic peptide corresponding to a sequence located near the N-terminus of human Atg7 (GeneID: 10533), conjugated to KLH. The corresponding sequence is identical in mouse and rat Atg7. The isotype is determined by ELISA using Mouse Monoclonal Antibody Isotyping Reagents, Catalog Number ISO2. The antibody is purified from culture supernatant of hybridoma cells grown in a bioreactor.

Monoclonal Anti-Atg7 recognizes human, rat and mouse Atg7. The antibody may be used in various immunochemical techniques including immunoblotting (~75 kDa) and immunoprecipitation. Detection of the Atg7 band by immunoblotting is specifically inhibited by 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 evolutionary 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

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material 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 at –20°C 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 dilution samples should be discarded if not used within 12 hours.

Product Profile

Immunoblotting: a working concentration of 2-4 µg/mL is recommended using whole extracts of HEK-293T or U87 cells.

Note: In order to obtain the best results using various techniques and preparations, we recommend determining optimal working dilutions 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).

ST,KAA,PHC 07/11-1