SANTA CRUZ BIOTECHNOLOGY, INC.

ATG7 siRNA (h): sc-41447

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The Power to Question

BACKGROUND

In yeast, autophagy is an essential process for survival during nutrient starvation and cell differentiation. The process of autophagy is characterized as a non-selective degradation of cytoplasmic proteins into membrane stuctures called autophagosomes, and it is dependent on several proteins, including the autophagy proteins ATG5 and ATG7. Yeast Atg7 and the human homolog, ATG7, share similarities with the ubiquitin-activating enzyme E1 in *Saccharomyces cerevisiae,* and are likewise responsible for enzymatically activating the autophagy conjugation system. Atg5 and the human homolog, ATG5 (also designated apoptosis specific protein or APS), function as substrates for the autophagy protein APG12. These proteins are covalently bonded together to form APG12/ATG5 conjugates, which are required for the progression of autophagy.

CHROMOSOMAL LOCATION

Genetic locus: ATG7 (human) mapping to 3p25.3.

PRODUCT

ATG7 siRNA (h) is a pool of 3 target-specific 19-25 nt siRNAs designed to knock down gene expression. Each vial contains 3.3 nmol of lyophilized siRNA, sufficient for a 10 µM solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see ATG7 shRNA Plasmid (h): sc-41447-SH and ATG7 shRNA (h) Lentiviral Particles: sc-41447-V as alternate gene silencing products.

For independent verification of ATG7 (h) gene silencing results, we also provide the individual siRNA duplex components. Each is available as 3.3 nmol of lyophilized siRNA. These include: sc-41447A, sc-41447B and sc-41447C.

STORAGE AND RESUSPENSION

Store lyophilized siRNA duplex at -20° C with desiccant. Stable for at least one year from the date of shipment. Once resuspended, store at -20° C, avoid contact with RNAses and repeated freeze thaw cycles.

Resuspend lyophilized siRNA duplex in 330 µl of the RNAse-free water provided. Resuspension of the siRNA duplex in 330 µl of RNAse-free water makes a 10 µM solution in a 10 µM Tris-HCl, pH 8.0, 20 mM NaCl, 1 mM EDTA buffered solution.

APPLICATIONS

ATG7 siRNA (h) is recommended for the inhibition of ATG7 expression in human cells.

SUPPORT REAGENTS

For optimal siRNA transfection efficiency, Santa Cruz Biotechnology's siRNA Transfection Reagent: sc-29528 (0.3 ml), siRNA Transfection Medium: sc-36868 (20 ml) and siRNA Dilution Buffer: sc-29527 (1.5 ml) are recommended. Control siRNAs or Fluorescein Conjugated Control siRNAs are available as 10 µM in 66 µl. Each contain a scrambled sequence that will not lead to the specific degradation of any known cellular mRNA. Fluorescein Conjugated Control siRNAs include: sc-36869, sc-44239, sc-44240 and sc-44241. Control siRNAs include: sc-37007, sc-44230, sc-44231, sc-44232, sc-44233, sc-44234, sc-44235, sc-44236, sc-44237 and sc-44238.

GENE EXPRESSION MONITORING

ATG7 (B-9): sc-376212 is recommended as a control antibody for monitoring of ATG7 gene expression knockdown by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000) or immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500).

RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor ATG7 gene expression knockdown using RT-PCR Primer: ATG7 (h)-PR: sc-41447-PR (20 µl, 497 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

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3. Ghavami, S., et al. 2011. Mevalonate cascade regulation of airway mesenchymal cell autophagy and apoptosis: a dual role for p53. PLoS ONE 6: e16523.
4. Yue, W., et al. 2013. Inhibition of the autophagic flux by salinomycin in breast cancer stem-like/progenitor cells interferes with their maintenance. Autophagy 9: 714-729.
5. Degtyarev, M., et al. 2014. Novel quantitative autophagy analysis by organelle flow cytometry after cell sonication. PLoS ONE 9: e87707.
6. Maji, S., et al. 2015. Mcl-1 is an important therapeutic target for oral squamous cell carcinomas. Oncotarget 6: 16623-16637.
7. Zhou, Y., et al. 2016. Autophagy induction contributes to GDC-0349 resistance in head and neck squamous cell carcinoma (HNSCC) cells. Biochem. Biophys. Res. Commun. 477: 174-180.
8. Zhang, D., et al. 2017. Integrin $\alpha_v\beta_5$ inhibition protects against ischemia-reperfusion-induced lung injury in an autophagy-dependent manner. Am. J. Physiol. Lung Cell. Mol. Physiol. 313: L384-L394.
9. Olagnier, D., et al. 2018. Nrf2 negatively regulates STING indicating a link between antiviral sensing and metabolic reprogramming. Nat. Commun. 9: 3506.
10. Zhu, H.Y., et al. 2019. Typhaneoside prevents acute myeloid leukemia (AML) through suppressing proliferation and inducing ferroptosis associated with autophagy. Biochem. Biophys. Res. Commun. 516: 1265-1271.
11. Shim, M.S., et al. 2019. The autophagic protein LC3 translocates to the nucleus and localizes in the nucleolus associated to NUFIP1 in response to cyclic mechanical stress. Autophagy 16: 1-14.

RESEARCH USE

For research use only, not for use in diagnostic procedures.