



Smurf2 siRNA (h): sc-41675

BACKGROUND

Smurf1 and Smurf2 (SMAD ubiquitination regulatory factor-1 and 2) are members of the Hect family of proteins, which also includes the ubiquitin (Ub) E3-type ligases Nedd3 and E6-AP. E3 ligases are involved in the enzymatic reactions of the Ub conjugating pathway, which targets proteins for degradation by the 26S Proteasome. Within the Ub pathway, the E3 ligases specifically catalyze the transfer of Ub from the Ub-conjugating enzymes to the individual protein substrate. As an E3 ligase, Smurf1 selectively interacts with receptor-regulated SMADs specific to the BMP pathway in order to trigger their ubiquitination and degradation. Smurf2 interacts with receptor-activated Smads (R-Smads), including Smad1, Smad2, and Smad3, but not Smad4. Although Smurf2 localizes to the nucleus, binding to Smad7 induces its export and its recruitment to the activated TGF β receptor, where it causes degradation of Smad7.

REFERENCES

1. Scheffner, M., et al. 1993. The HPV-16 E6 and E6-AP complex functions as a ubiquitin-protein ligase in the ubiquitination of p53. *Cell* 75: 495-505.
2. Huibregtse, J.M., et al. 1995. A family of proteins structurally and functionally related to the E6-AP ubiquitin-protein ligase. *Proc. Natl. Acad. Sci. USA* 92: 2563-2567.
3. Hershko, A., et al. 1998. The ubiquitin system. *Annu. Rev. Biochem.* 67: 425-479.

CHROMOSOMAL LOCATION

Genetic locus: SMURF2 (human) mapping to 17q23.3.

PRODUCT

Smurf2 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 μ M solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see Smurf2 shRNA Plasmid (h): sc-41675-SH and Smurf2 shRNA (h) Lentiviral Particles: sc-41675-V as alternate gene silencing products.

For independent verification of Smurf2 (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-41675A, sc-41675B and sc-41675C.

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 μ l of the RNase-free water provided. Resuspension of the siRNA duplex in 330 μ l of RNase-free water makes a 10 μ M solution in a 10 μ M Tris-HCl, pH 8.0, 20 mM NaCl, 1 mM EDTA buffered solution.

APPLICATIONS

Smurf2 siRNA (h) is recommended for the inhibition of Smurf2 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 μ M in 66 μ l. 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

Smurf2 (D-5): sc-393848 is recommended as a control antibody for monitoring of Smurf2 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 Smurf2 gene expression knockdown using RT-PCR Primer: Smurf2 (h)-PR: sc-41675-PR (20 μ l, 468 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Tan, R., et al. 2006. Downregulation of SnoN expression in obstructive nephropathy is mediated by an enhanced ubiquitin-dependent degradation. *J. Am. Soc. Nephrol.* 17: 2781-2791.
2. David, D., et al. 2014. Smurf2 E3 ubiquitin ligase modulates proliferation and invasiveness of breast cancer cells in a CNKSR2 dependent manner. *Cell Div.* 9: 2.
3. Kim, D.G., et al. 2016. Oncogenic mutation of AIMP2/p38 inhibits its tumor-suppressive interaction with Smurf2. *Cancer Res.* 76: 3422-3436.
4. Zhao, C., et al. 2018. Role of tumor necrosis factor- α in epithelial-to-mesenchymal transition in transplanted kidney cells in recipients with chronic allograft dysfunction. *Gene* 642: 483-490.
5. Dong, S., et al. 2019. The HECT ubiquitin E3 ligase Smurf2 degrades μ -opioid receptor 1 in the ubiquitin-proteasome system in lung epithelial cells. *Am. J. Physiol., Cell Physiol.* 316: C632-C640.
6. Zhang, Z., et al. 2021. Smad7 down-regulation via ubiquitin degradation mediated by Smurf2 in fibroblasts of hypertrophic scars in burned patients. *Burns* 47: 1333-1341.
7. Jeon, S., et al. 2023. The miR-15b-Smurf2-HSP27 axis promotes pulmonary fibrosis. *J. Biomed. Sci.* 30: 2.
8. Chen, Z., et al. 2024. DNA topoisomerase II inhibition potentiates osimertinib's therapeutic efficacy in EGFR-mutant non-small cell lung cancer models. *J. Clin. Invest.* 134: e172716.

RESEARCH USE

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