SANTA CRUZ BIOTECHNOLOGY, INC.

# TGFβ RI siRNA (m): sc-40223

## BACKGROUND

A total of three members of the TGFβ family, namely TGFβ1, TGFβ2 and TGFβ3, have been identified in mammals. Each is synthesized as a latent precursor that is subsequently cleaved forming the 112 amino acid growth factor which becomes active upon dimerization. TGFβs mediate their activity by high affinity binding to the TGFβ receptor type-II (TGFβ RII) with a cytoplasmic serine-threonine kinase domain. For signaling growth inhibition and early gene responses, TGFβ RII requires both its kinase activity and its association with a TGFβ-binding protein, designated TGFβ receptor type-1 (TGFβ RI). TGFβ RI is a 503 amino acid single-pass type I membrane protein that is expressed ubiquitously and, with TGFβ RII, functions as a receptor for TGFβ. Defects in the gene encoding TGFβ RI are the cause of aortic aneurysm familial thoracic type 5 (AAT5), Loeys-Dietz syndrome type 2A (LDS2A) and Loeys-Dietz syndrome type 1A (LDS1A).

## REFERENCES


1. Anzano, M.A., et al. 1983. Sarcoma growth factor from conditioned medium of virally transformed cells is composed of both type α and type β transforming growth factors. Proc. Natl. Acad. Sci. USA 80: 6264-6268.
2. Derynck, R., et al. 1985. Human transforming growth factor β cDNA sequence and expression in tumor cell lines. Nature 316: 701-705.
3. ten Dijke, P., et al. 1988. Identification of a new member of the transforming growth factor type β gene family. Proc. Natl. Acad. Sci. USA 85: 4715-4719.
4. Cheifetz, S., et al. 1990. Distinct transforming growth factor β receptor subsets as determinants of cellular responsiveness to three TGFβ isoforms. J. Biol. Chem. 265: 20533-20538.
5. Massagué, J. 1992. Receptors for the TGFβ family. Cell 69: 1067-1070.
6. Wrana, J.L., et al. 1992. TGFβ signals through a heteromeric protein kinase receptor complex. Cell 71: 1003-1014.
7. Attisano, L., et al. 1993. Identification of human Activin and TGFβ type I receptors that form heteromeric kinase complexes with type II receptors. Cell 75: 671-680.
8. Franzén, P., et al. 1993. Cloning of a TGFβ type I receptor that forms a heteromeric complex with the TGFβ type II receptor. Cell 75: 681-692.


## CHROMOSOMAL LOCATION

Genetic locus: Tgfbr1 (mouse) mapping to 4 B1.

## PRODUCT

TGFβ RI siRNA (m) 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 TGFβ RI shRNA Plasmid (m): sc-40223-SH and TGFβ RI shRNA (m) Lentiviral Particles: sc-40223-V as alternate gene silencing products.

For independent verification of TGFβ RI (m) gene silencing results, we also provide the individual siRNA duplex components. Each is available as 3.3 nmol of lyophilized siRNA. These include: sc-40223A, sc-40223B and sc-40223C.

## 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

TGFβ RI siRNA (m) is recommended for the inhibition of TGFβ RI expression in mouse 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

TGFβ RI (RM0016-3A11): sc-101574 is recommended as a control antibody for monitoring of TGFβ RI 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 TGFβ RI gene expression knockdown using RT-PCR Primer: TGFβ RI (m)-PR: sc-40223-PR (20 µl, 458 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

## SELECT PRODUCT CITATIONS


1. Xiao, Q., et al. 2009. Embryonic stem cell differentiation into smooth muscle cells is mediated by Nox4-produced $H_2O_2$. Am. J. Physiol., Cell Physiol. 296: C711-C723.
2. Lin, H., et al. 2018. Proprotein convertase furin inhibits matrix metalloproteinase 13 in a TGFβ-dependent manner and limits osteoarthritis in mice. Sci. Rep. 8: 10488.
3. Fang, P., et al. 2018. SIRT7 regulates the TGF-β1-induced proliferation and migration of mouse airway smooth muscle cells by modulating the expression of TGF-β receptor I. Biomed. Pharmacother. 104: 781-787.


## RESEARCH USE

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