SANTA CRUZ BIOTECHNOLOGY, INC.

ACTC1 siRNA (h): sc-105181

BACKGROUND

All eukaryotic cells express Actin, which often constitutes as much as 50% of total cellular protein. Actin filaments can form both stable and labile structures and are crucial components of microvilli and the contractile apparatus of muscle cells. While lower eukaryotes, such as yeast, have only one Actin gene, higher eukaryotes have several Actin isoforms encoded by a family of genes. At least six types of Actin are present in mammalian tissues and fall into three classes, namely α-, β- and γ-Actin. α-Actin expression is limited to various types of muscle, whereas -β and γ-Actin are the principle constituents of filaments in other tissues. ACTC1 (Actin, α cardiac muscle 1), also known as CMD1R or ACTC, is a 377 amino acid member of the α-Actin class of Actin proteins. Localized to both the cytoplasm and the cytoskeleton, ACTC1 is involved in cell motility and structural integrity. Defects in the gene encoding ACTC1 are the cause of cardiomyopathy familial hypertrophic type 11 (CMH11) and cardiomyopathy dilated type 1R (CMD1R), both of which are heart disorders that are associated with a risk of sudden cardiac death.

REFERENCES

1. Hamada, H., et al. 1982. Molecular structure and evolutionary origin of human cardiac muscle Actin gene. Proc. Natl. Acad. Sci. USA 79: 5901-5905.
2. Mogensen, J., et al. 1999. α-cardiac Actin is a novel disease gene in familial hypertrophic cardiomyopathy. J. Clin. Invest. 103: R39-R43.
3. Online Mendelian Inheritance in Man, OMIM™. 2002. Johns Hopkins University, Baltimore, MD. MIM Number: 102540. World Wide Web URL: http://www.ncbi.nlm.nih.gov/omim/
4. Bookwalter, C.S. and Trybus, K.M. 2006. Functional consequences of a mutation in an expressed human α-cardiac Actin at a site implicated in familial hypertrophic cardiomyopathy. J. Biol. Chem. 281: 16777-16784.
5. Monserrat, L., et al. 2007. Mutation in the α-cardiac Actin gene associated with apical hypertrophic cardiomyopathy, left ventricular non-compaction, and septal defects. Eur. Heart J. 28: 1953-1961.
6. Matsson, H., et al. 2008. α-cardiac Actin mutations produce atrial septal defects. Hum. Mol. Genet. 17: 256-265.

CHROMOSOMAL LOCATION

Genetic locus: ACTC1 (human) mapping to 15q14.

PRODUCT

ACTC1 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 ACTC1 shRNA Plasmid (h): sc-105181-SH and ACTC1 shRNA (h) Lentiviral Particles: sc-105181-V as alternate gene silencing products.

For independent verification of ACTC1 (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-105181A, sc-105181B and sc-105181C.

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

ACTC1 siRNA (h) is recommended for the inhibition of ACTC1 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.

RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor ACTC1 gene expression knockdown using RT-PCR Primer: ACTC1 (h)-PR: sc-105181-PR (20 µl). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Hoshimaru, T., et al. 2023. Actin α2, smooth muscle (ACTA2) is involved in the migratory potential of malignant gliomas, and its increased expression at recurrence is a significant adverse prognostic factor. Brain Sci. 13: 1477.

RESEARCH USE

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

PROTOCOLS

See our web site at www.scbt.com for detailed protocols and support products.