

# Control siRNA-D: sc-44232

## BACKGROUND

RNA interference (RNAi) is one of the most exciting discoveries of the past decade in functional genomics and proteomics. While first recognized in nematodes as a response to exogenously introduced long double-stranded RNA (dsRNA), it is now clear that RNAi is utilized by most eukaryotes *in vivo* for anti-viral defense, transposon activity modulation and gene regulation, and has rapidly become an important research tool for gene silencing.

Long double-stranded RNAs (typically more than 200 nucleotides) can be used to silence the expression of target genes in a variety of organisms and cell types. Upon introduction, the long dsRNAs enter a cellular pathway that is commonly referred to as the RNA interference (RNAi) pathway. The dsRNAs are processed by an RNase III-like enzyme called Dicer into small interfering RNAs (siRNAs), short RNA duplexes of 19-21 nucleotides with two nucleotide 3' overhangs on each strand. The siRNAs are then assembled into endoribonuclease-containing complexes known as RNA-induced silencing complexes (RISCs), unwinding in the process. Activated RISCs subsequently bind to complementary transcripts by base pairing interactions between the siRNA anti-sense strand and complementary mRNA. The bound mRNA is cleaved and sequence specific degradation of mRNA results in gene silencing.

In mammalian cells, introduction of long dsRNA (more than 30 nucleotides) initiates a potent anti-viral response, exemplified by nonspecific inhibition of protein synthesis and RNA degradation. The mammalian anti-viral response can be bypassed, however, by the introduction of siRNAs.

Santa Cruz Biotechnology, Inc. currently offers more than 10,000 target-specific 19-25 nucleotide siRNAs that can be used to knock down protein expression in a broad variety of mammalian cell types. Our product line includes siRNAs designed to silence a large selection of proteins, including tumor suppressors, transcription regulators, cell cycle proteins, membrane receptors, signaling intermediates, kinases, cell adhesion proteins and proteins involved in lymphocyte signaling. In addition, for each siRNA we offer an appropriate "matched" control antibody for confirmation of targeted mRNA silencing by either Western blotting or fluorescence antibody cell staining. We also offer transfection reagent, appropriate buffers and fluorescein-labeled non-targeted siRNA designed to monitor transfection efficiency.

## PRODUCT

Control siRNA-D is a non-targeting 20-25 nt siRNA designed as a negative control. Each vial contains lyophilized siRNA sufficient for 66  $\mu$ l of 10  $\mu$ M solution when resuspended as directed below. Each vial contains sufficient product for 10-20 transfections. See support reagents below for additional fluorescein conjugated and non-conjugated siRNA controls.

## APPLICATIONS

Control siRNA-D is recommended as a negative control for evaluating RNAi off-target effects, and in order to verify the accuracy of gene specific siRNA-dependent RNAi.

## RESEARCH USE

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

## STORAGE AND RESUSPENSION

Store lyophilized siRNA duplex at  $-20^{\circ}$  C with desiccant; Stable for at least one year from the date of shipment. Once resuspended, store at  $-20^{\circ}$  C, avoid contact with RNases and repeated freeze thaw cycles.

Resuspend lyophilized siRNA duplex in 66  $\mu$ l of the RNase-free water provided. Resuspension of the siRNA duplex in 66  $\mu$ l of RNase-free water makes a 10  $\mu$ M solution in a 10  $\mu$ M Tris-HCl, pH 8.0, 20 mM NaCl, 1 mM EDTA buffered solution.

## SUPPORT REAGENTS

| PRODUCT                                 | CAT. #   | DESCRIPTION   | AMOUNT   |
|---|----------|---|--|
| Control siRNA-A                         | sc-37007 | Control siRNAs A-J are negative controls for experiments using targeted siRNA transfection; each product consists of a scrambled sequence that will not lead to the specific degradation of any known cellular mRNA   | 66 $\mu$ l,<br>10 $\mu$ M;<br>10-20<br>transfections |
| Control siRNA-B                         | sc-44230 | see description above   | see above  |
| Control siRNA-C                         | sc-44231 | see description above   | see above  |
| Control siRNA-D                         | sc-44232 | see description above   | see above  |
| Control siRNA-E                         | sc-44233 | see description above   | see above  |
| Control siRNA-F                         | sc-44234 | see description above   | see above  |
| Control siRNA-G                         | sc-44235 | see description above   | see above  |
| Control siRNA-H                         | sc-44236 | see description above   | see above  |
| Control siRNA-I                         | sc-44237 | see description above   | see above  |
| Control siRNA-J                         | sc-44238 | see description above   | see above  |
| Control siRNA (Fluorescein Conjugate)-A | sc-36869 | Control siRNA (Fluorescein Conjugates) A-D are controls to monitor transfection efficiency by fluorescence microscopy; each product consists of a scrambled sequence conjugated to fluorescein that will not lead to the specific degradation of any cellular mRNA.   | 66 $\mu$ l,<br>10 $\mu$ M;<br>10-20<br>transfections |
| Control siRNA (Fluorescein Conjugate)-B | sc-44239 | see description above   | see above  |
| Control siRNA (Fluorescein Conjugate)-C | sc-44240 | see description above   | see above  |
| Control siRNA (Fluorescein Conjugate)-D | sc-44241 | see description above   | see above  |
| siRNA Dilution Buffer                   | sc-29527 | TRIS-EDTA based buffer prepared from RNase-free water suitable for storage and dilution of siRNA; pH 8.   | 1.5 ml   |
| siRNA Transfection Reagent              | sc-29528 | Delivers siRNA into cells with minimal cell toxicity; enables highly efficient siRNA transfection in a variety of cell lines including HeLa, A549, Jurkat and NIH-3T3.  | 0.3 ml;<br>50-100<br>transfections                   |
| siRNA Transfection Medium               | sc-36868 | Reduced-serum medium suitable for addition to siRNA suspension and siRNA transfection reagent immediately prior to cell transfection; modification of Eagle's Minimal Essential Medium, buffered with HEPES and sodium bicarbonate, and supplemented with hypoxanthine, thymidine, sodium pyruvate, L-glutamine, trace elements, growth factors and phenol red. | 20 ml  |

siRNA support reagents are optimal for successful delivery of Santa Cruz Biotechnology, Inc.'s siRNA Gene Silencers into mammalian cells.

## SELECT PRODUCT CITATIONS

- Meng, R.D., et al. 2009.  $\gamma$ -Secretase inhibitors abrogate oxaliplatin-induced activation of the Notch-1 signaling pathway in colon cancer cells resulting in enhanced chemosensitivity. *Cancer Res.* 69: 573-582.
- Balaratnam, S., et al. 2022. Decay of piwi-interacting RNAs in human cells is primarily mediated by 5' to 3' exoribonucleases. *ACS Chem. Biol.* 17: 1723-1732.