

# FANCA siRNA (h): sc-40567

## BACKGROUND

Fanconi anemia (FA) is an autosomal recessive disorder characterized by bone marrow failure, birth defects and chromosomal instability. At the cellular level, FA is characterized by spontaneous chromosomal breakage and a unique hypersensitivity to DNA cross-linking agents. At least eight complementation groups (A-G) have been identified and six FA genes (for subtypes A, C, D2, E, F and G) have been cloned. The FA proteins lack sequence homologies or motifs that could point to a molecular function. The cellular accumulation of FA proteins, including FANCA and FANCG, is subject to regulation by TNF $\alpha$  signaling. Phosphorylation of FANCA (Fanconi anemia complementation group) proteins is thought to be important for the function of the FA pathway. FANCA, also known as FACA and FANCH, associates with the Brm-related gene 1 (BRG1) product, a subunit of the SWI/SNF complex which remodels chromatin structure through a DNA-dependent ATPase activity. FANCA is mainly expressed in lymphoid tissues, testis and ovary. The amino-terminal region of the FANCA protein is required for FANCG binding, FANCC binding, nuclear localization and functional activity of the complex. The human FANCA gene maps to chromosome 16q24.3 and encodes a 1,455 amino acid protein.

## REFERENCES

- Garcia-Higuera, I., et al. 1999. Fanconi anemia proteins FANCA, FANCC, and FANCG/XRCC9 interact in a functional nuclear complex. *Mol. Cell. Biol.* 19: 4866-4873.
- de Winter, J.P., et al. 2000. The Fanconi anemia protein FANCF forms a nuclear complex with FANCA, FANCC and FANCG. *Hum. Mol. Genet.* 9: 2665-2674.
- Garcia-Higuera, I., et al. 2000. The Fanconi anemia proteins FANCA and FANCG stabilize each other and promote the nuclear accumulation of the Fanconi anemia complex. *Blood* 96: 3224-3230.
- van de Vrugt, H.J., et al. 2000. Cloning and characterization of murine Fanconi anemia group A gene: FANCA protein is expressed in lymphoid tissues, testis, and ovary. *Mamm. Genome* 11: 326-331.
- Yagasaki, H., et al. 2001. A cytoplasmic serine protein kinase binds and may regulate the Fanconi anemia protein FANCA. *Blood* 98: 650-6657.
- Otsuki, T., et al. 2001. Fanconi anemia protein, FANCA, associates with Brg-1, a component of the human SWI/SNF complex. *Hum. Mol. Genet.* 10: 2651-2660.
- Futaki, M., et al. 2001. Fanconi anemia protein, FANCG, is a phosphoprotein and is upregulated with FANCA after TNF $\alpha$  treatment. *Biochem. Biophys. Res. Commun.* 281: 347-351.
- Otsuki, T., et al. 2002. Phosphorylation of Fanconi anemia protein, FANCA, is regulated by Akt kinase. *Biochem. Biophys. Res. Commun.* 291: 628-634.
- Online Mendelian Inheritance in Man, OMIM™. 2007. Johns Hopkins University, Baltimore, MD. MIM Number: 227650. World Wide Web URL: <http://www.ncbi.nlm.nih.gov/omim/>

## CHROMOSOMAL LOCATION

Genetic locus: FANCA (human) mapping to 16q24.3.

## PRODUCT

FANCA siRNA (h) is a target-specific 19-25 nt siRNA designed to knock down gene expression. Each vial contains 3.3 nmol of lyophilized siRNA, sufficient for a 10  $\mu$ M solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see FANCA shRNA Plasmid (h): sc-40567-SH and FANCA shRNA (h) Lentiviral Particles: sc-40567-V as alternate gene silencing products.

## 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  $\mu$ l of the RNase-free water provided. Resuspension of the siRNA duplex in 330  $\mu$ 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.

## APPLICATIONS

FANCA siRNA (h) is recommended for the inhibition of FANCA 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  $\mu$ M in 66  $\mu$ 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.

## RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor FANCA gene expression knockdown using RT-PCR Primer: FANCA (h)-PR: sc-40567-PR (20  $\mu$ l, 491 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

## SELECT PRODUCT CITATIONS

- Chen, C.C., et al. 2009. CHK1 inhibition as a strategy for targeting Fanconi anemia (FA) DNA repair pathway deficient tumors. *Mol. Cancer* 8: 24.
- Kumari, U., et al. 2014. Evidence of mitochondrial dysfunction and impaired Ros detoxifying machinery in Fanconi anemia cells. *Oncogene* 33: 165-172.
- Miller, H.E., et al. 2020. Reconstruction of Ewing sarcoma developmental context from mass-scale transcriptomics reveals characteristics of EWSR1-FL11 permissibility. *Cancers* 12 pii: E948.

## RESEARCH USE

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