



# PKA $\alpha$ cat siRNA (r): sc-156094

## BACKGROUND

The second messenger cyclic AMP (cAMP) mediates diverse cellular responses to external signals such as proliferation, ion transport, regulation of metabolism and gene transcription by activation of the cAMP-dependent protein kinase A (cAPK or PKA). Activation of PKA occurs when cAMP binds to the two regulatory subunits of the tetrameric PKA holoenzyme resulting in release of active catalytic subunits. Three catalytic (C) subunits have been identified, designated PKA $\alpha$  cat (C $\alpha$ ), PKA $\beta$  cat (C $\beta$ ) and PKA $\gamma$  cat (C $\gamma$ ). Each subunit represents specific gene products. PKA $\alpha$  cat and PKA $\beta$  cat are closely related (93% amino acid sequence similarity), whereas PKA $\gamma$  cat displays 83% and 79% similarity to PKA $\alpha$  cat and PKA $\beta$  cat, respectively. Activation of transcription upon elevation of cAMP levels results from translocation of PKA to the nucleus where it phosphorylates the transcription factor cAMP response element binding protein (CREB) on Serine 133, which in turn leads to TFIIB binding to TATA-box-binding protein TBP1, thus linking phospho-CREB to the Pol II transcription initiation complex.

## REFERENCES

1. Beavo, J.A., et al. 1974. Activation of protein kinase by physiological concentrations of cyclic AMP. *Proc. Natl. Acad. Sci. USA* 71: 3580-3583.
2. Krebs, E.G., et al. 1979. Phosphorylation and dephosphorylation of enzymes. *Annu. Rev. Biochem.* 48: 923-959.
3. Maldonado, F., et al. 1988. cAMP-dependent protein kinase,  $\alpha$ -catalytic subunit. *Nucleic Acids Res.* 16: 8189-8190.
4. Gonzalez, G.A., et al. 1989. Cyclic AMP stimulates somatostatin gene transcription by phosphorylation of CREB at Serine 133. *Cell* 59: 675-680.

## CHROMOSOMAL LOCATION

Genetic locus: Prkaca (rat) mapping to 19q11.

## PRODUCT

PKA $\alpha$  cat siRNA (r) 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  $\mu$ M solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see PKA $\alpha$  cat shRNA Plasmid (r): sc-156094-SH and PKA $\alpha$  cat shRNA (r) Lentiviral Particles: sc-156094-V as alternate gene silencing products.

For independent verification of PKA $\alpha$  cat (r) gene silencing results, we also provide the individual siRNA duplex components. Each is available as 3.3 nmol of lyophilized siRNA. These include: sc-156094A, sc-156094B and sc-156094C.

## 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

PKA $\alpha$  cat siRNA (r) is recommended for the inhibition of PKA $\alpha$  cat expression in rat 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.

## GENE EXPRESSION MONITORING

PKA $\alpha$  cat (A-2): sc-28315 is recommended as a control antibody for monitoring of PKA $\alpha$  cat 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).

To ensure optimal results, the following support reagents are recommended: 1) Western Blotting: use m-IgG $\kappa$  BP-HRP: sc-516102 or m-IgG $\kappa$  BP-HRP (Cruz Marker): sc-516102-CM (dilution range: 1:1000-1:10000), Cruz Marker™ Molecular Weight Standards: sc-2035, UltraCruz® Blocking Reagent: sc-516214 and Western Blotting Luminol Reagent: sc-2048. 2) Immunofluorescence: use m-IgG $\kappa$  BP-FITC: sc-516140 or m-IgG $\kappa$  BP-PE: sc-516141 (dilution range: 1:50-1:200) with UltraCruz® Mounting Medium: sc-24941 or UltraCruz® Hard-set Mounting Medium: sc-359850.

## RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor PKA $\alpha$  cat gene expression knockdown using RT-PCR Primer: PKA $\alpha$  cat (r)-PR: sc-156094-PR (20  $\mu$ l). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

## SELECT PRODUCT CITATIONS

1. Chang, S.Y., et al. 2012. Molecular mechanisms of early growth response protein-1 (EGR-1) expression by quercetin in INS-1  $\beta$ -cells. *J. Cell. Biochem.* 113: 1559-1568.
2. Michael, E.S., et al. 2019. Trace amine-associated receptor 1 (TAAR1) promotes anti-diabetic signaling in insulin-secreting cells. *J. Biol. Chem.* 294: 4401-4411.

## RESEARCH USE

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

## PROTOCOLS

See our web site at [www.scbt.com](http://www.scbt.com) for detailed protocols and support products.