

SignalSilence® PKA C- α siRNA Kit

✓ 1 Kit
(50 Transfections per siRNA)

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New 11/25

This product is for *in vitro* research use only and is not intended for use in humans or animals.
This product is not intended for use as a therapeutic or in diagnostic procedures.

Products Included	Product #	Quantity	Isotype	Assay
SignalSilence® PKA C- α siRNA I	6406	10 μ M in 150 μ l		50 Transfections
SignalSilence® PKA C- α siRNA II	6574	10 μ M in 150 μ l		50 Transfections
PKA C- α Antibody	4782	40 μ l	Rabbit IgG	4 Western mini blots

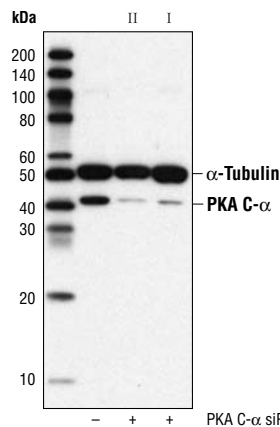
Species Cross-Reactivity: H

Molecular Weight of Protein: 42 kDa

Description: SignalSilence® PKA C- α siRNA Kit from Cell Signaling Technology (CST) allow the researcher to specifically inhibit PKA C- α expression. The kit utilizes RNA interference, a method whereby gene expression can be selectively silenced through the delivery of double stranded RNA molecules into the cell. All SignalSilence® siRNA products are rigorously tested in-house and have been shown to reduce target protein expression. SignalSilence® PKA C- α siRNA Kit includes PKA C- α siRNA I and II and a target-specific PKA C- α antibody to confirm the silencing of PKA C- α expression by western analysis.

Background: The second messenger cyclic AMP (cAMP) activates cAMP-dependent protein kinase (PKA or cAPK) in mammalian cells and controls many cellular mechanisms such as gene transcription, ion transport and protein phosphorylation (1). Inactive PKA is a heterotetramer composed of a regulatory subunit (R) dimer and a catalytic subunit (C) dimer. In this inactive state, the pseudosubstrate sequences on the R subunits block the active sites on the C subunits. Three C subunit isoforms (C- α , C- β and C- γ) and two families of regulatory subunits (RI and RII) with distinct cAMP binding properties have been identified. Within the two R families, two isoforms, α and β (RI- α , RI- β , RII- α and RII- β) exist. Upon binding of cAMP to the R subunits, the autoinhibitory contact is eased and active monomeric C subunits are released. PKA shares substrate specificity with Akt (PKB) and PKC, which is characterized by an arginine at position -3 relative to the phosphorylated serine or threonine residue (2). Substrates that present this consensus sequence and have been shown to be phosphorylated by PKA are Bad (Ser155), CREB (Ser133) and GSK-3 (GSK-3 α Ser21 and GSK-3 β Ser9) (3-5). In addition, combined knock-down of PKA C- α and - β blocks cAMP-mediated phosphorylation of Raf (Ser43 and Ser259) (6). Autophosphorylation and phosphorylation by PDK-1 are two known mechanisms responsible for phosphorylation of the C subunit at Thr197 (7).

Directions for Use: CST recommends transfection with 100 nM PKA C- α siRNA 48 to 72 hours prior to cell lysis. For transfection procedure, follow protocol provided by the transfection reagent manufacturer. Please feel free to contact CST with any questions on use.



Western blot analysis of extracts from HeLa cells, transfected with 100 nM SignalSilence® Control siRNA (Fluorescein Conjugate) #6201 (-), SignalSilence® PKA C- α siRNA II (+) or SignalSilence® PKA C- α siRNA I (+), using PKA C- α Antibody and α -Tubulin (11H10) Rabbit mAb #2125. The PKA C- α antibody confirms silencing of PKA C- α expression while α -Tubulin (11H10) Rabbit mAb is used to control for loading and specificity of PKA C- α siRNA.

Entrez-Gene ID #5566
Swiss-Prot Acc. #P17612

Storage: PKA C- α siRNA I and II are supplied in RNase-free water. Aliquot and store at -20°C. Antibody is supplied in 10 mM sodium HEPES (pH 7.5), 150 mM NaCl, 100 μ g/ml BSA and 50% glycerol. Store at -20°C. Do not aliquot the antibody.

Recommended Antibody Dilutions:

Western blotting 1:1000

Companion Products:

SignalSilence® Control siRNA (Fluorescein Conjugate) #6201
SignalSilence® Control siRNA (Unconjugated) #6568
Phospho-PKA C (Thr197) Antibody #4781
Phospho-(Ser/Thr) PKA Substrate Antibody #9621
Anti-rabbit IgG, HRP-linked Antibody #7074

Background References:

- (1) Montminy, M. (1997) *Annu. Rev. Biochem.* 66, 807–822.
- (2) Dell'Acqua, M.L. and Scott, J.D. (1997) *J. Biol. Chem.* 272, 12881–12884.
- (3) Tan, Y. et al. (2000) *J. Biol. Chem.* 275, 25865–25869.
- (4) Gonzalez, G.A. and Montminy, M.R. (1989) *Cell* 59, 675–680.
- (5) Fang, X. et al. (2000) *Proc. Natl. Acad. Sci. USA* 97, 11960–11965.
- (6) Dumaz, N. and Marais, R. (2003) *J. Biol. Chem.* 278, 29819–29823.
- (7) Moore, M.J. et al. (2002) *J. Biol. Chem.* 277, 47878–47884.

Western Immunoblotting Protocol (Primary Antibody Incubation in BSA)

For Western blots, incubate membrane with diluted antibody in 5% w/v BSA, 1X TBS, 0.1% Tween-20 at 4°C with gentle shaking, overnight.

A Solutions and Reagents

NOTE: Prepare solutions with Milli-Q or equivalently purified water.

- 1X Phosphate Buffered Saline (PBS)
- 1X SDS Sample Buffer:** 62.5 mM Tris-HCl (pH 6.8 at 25°C), 2% w/v SDS, 10% glycerol, 50 mM DTT, 0.01% w/v bromophenol blue or phenol red
- Transfer Buffer:** 25 mM Tris base, 0.2 M glycine, 20% methanol (pH 8.5)
- 10X Tris Buffered Saline (TBS):** To prepare 1 liter of 10X TBS: 24.2 g Tris base, 80 g NaCl; adjust pH to 7.6 with HCl (use at 1X).
- Nonfat Dry Milk (weight to volume [w/v])
- Blocking Buffer:** 1X TBS, 0.1% Tween-20 with 5% w/v nonfat dry milk; for 150 ml, add 15 ml 10X TBS to 135 ml water, mix. Add 7.5 g nonfat dry milk and mix well. While stirring, add 0.15 ml Tween-20 (100%).
- Wash Buffer:** 1X TBS, 0.1% Tween-20 (TBS/T)
- Bovine Serum Albumin (BSA)
- Primary Antibody Dilution Buffer:** 1X TBS, 0.1% Tween-20 with 5% BSA; for 20 ml, add 2 ml 10X TBS to 18 ml water, mix. Add 1.0 g BSA and mix well. While stirring, add 20 µl Tween-20 (100%).
- Phototope[®]-HRP Western Blot Detection System #7071:** Includes biotinylated protein ladder, secondary anti-rabbit (#7074) antibody conjugated to horseradish peroxidase (HRP), anti-biotin antibody conjugated to HRP, LumiGLO[®] chemiluminescent reagent and peroxide.
- Prestained Protein Marker, Broad Range (Premixed Format) #7720
- Biotinylated Protein Ladder Detection Pack #7727
- Blotting Membrane:** This protocol has been optimized for nitrocellulose membranes, which CST recommends. PVDF membranes may also be used.

B Protein Blotting

A general protocol for sample preparation is described below.

- Treat cells by adding fresh media containing regulator for desired time.
- Aspirate media from cultures; wash cells with 1X PBS; aspirate.
- Lyse cells by adding 1X SDS sample buffer (100 µl per well of 6-well plate or 500 µl per plate of 10 cm diameter plate). Immediately scrape the cells off the plate and transfer the extract to a microcentrifuge tube. Keep on ice.
- Sonicate for 10–15 seconds to shear DNA and reduce sample viscosity.
- Heat a 20 µl sample to 95–100°C for 5 minutes; cool on ice.
- Microcentrifuge for 5 minutes.
- Load 20 µl onto SDS-PAGE gel (10 cm x 10 cm).

NOTE: CST recommends loading prestained molecular weight markers (#7720, 10 µl/lane) to verify electrotransfer and biotinylated protein ladder (#7727, 10 µl/lane) to determine molecular weights.

- Electrotransfer to nitrocellulose or PVDF membrane.

C Membrane Blocking and Antibody Incubations

NOTE: Volumes are for 10 cm x 10 cm (100 cm²) of membrane; for different sized membranes, adjust volumes accordingly.

- (Optional) After transfer, wash nitrocellulose membrane with 25 ml TBS for 5 minutes at room temperature.
- Incubate membrane in 25 ml of blocking buffer for 1 hour at room temperature.
- Wash three times for 5 minutes each with 15 ml of TBS/T.
- Incubate membrane and primary antibody (at the appropriate dilution) in 10 ml primary antibody dilution buffer with gentle agitation overnight at 4°C.
- Wash three times for 5 minutes each with 15 ml of TBS/T.
- Incubate membrane with HRP-conjugated secondary antibody (1:2000) and HRP-conjugated anti-biotin antibody (1:1000) to detect biotinylated protein markers in 10 ml of blocking buffer with gentle agitation for 1 hour at room temperature.
- Wash three times for 5 minutes each with 15 ml of TBS/T.

D Detection of Proteins

- Incubate membrane with 10 ml LumiGLO[®] (0.5 ml 20X LumiGLO[®], 0.5 ml 20X Peroxide and 9.0 ml Milli-Q water) with gentle agitation for 1 minute at room temperature.

NOTE: LumiGLO[®] substrate can be further diluted if signal response is too fast.

- Drain membrane of excess developing solution (do not let dry), wrap in plastic wrap and expose to x-ray film. An initial 10-second exposure should indicate the proper exposure time.

NOTE: Due to the kinetics of the detection reaction, signal is most intense immediately following LumiGLO[®] incubation and declines over the following 2 hours.