

# PKA $\alpha$ cat (C-7): sc-48412

## 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 TFIIIB 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. 1980. Phosphorylation and dephosphorylation of enzymes. *Ann. 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 (human) mapping to 19p13.12; Prkaca (mouse) mapping to 8 C3.

## SOURCE

PKA $\alpha$  cat (C-7) is a mouse monoclonal antibody specific for an epitope mapping between amino acids 322-351 at the C-terminus of PKA $\alpha$  of human origin.

## PRODUCT

Each vial contains 200  $\mu$ g IgG<sub>2a</sub> kappa light chain in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

Blocking peptide available for competition studies, sc-48412 P, (100  $\mu$ g peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% stabilizer protein).

## STORAGE

Store at 4° C, **\*\*DO NOT FREEZE\*\***. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.

## RESEARCH USE

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

## APPLICATIONS

PKA $\alpha$  cat (C-7) is recommended for detection of PKA $\alpha$  catalytic subunit of mouse, rat and human origin by Western Blotting (starting dilution 1:100, dilution range 1:100-1:1000), immunoprecipitation [1-2  $\mu$ g per 100-500  $\mu$ g of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500), immunohistochemistry (including paraffin-embedded sections) (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000); may cross-reactive with  $\beta$  and  $\gamma$  subunits.

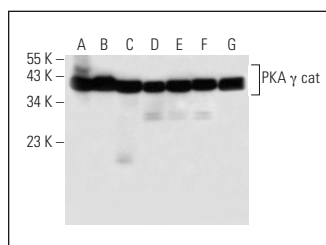
PKA $\alpha$  cat (C-7) is also recommended for detection of PKA $\alpha$  catalytic subunit in additional species, including equine, bovine and porcine.

Suitable for use as control antibody for PKA $\alpha$  cat siRNA (h): sc-36240, PKA $\alpha$  cat siRNA (m): sc-36241, PKA $\alpha$  cat siRNA (r): sc-156094, PKA $\alpha$  cat shRNA Plasmid (h): sc-36240-SH, PKA $\alpha$  cat shRNA Plasmid (m): sc-36241-SH, PKA $\alpha$  cat shRNA Plasmid (r): sc-156094-SH, PKA $\alpha$  cat shRNA (h) Lentiviral Particles: sc-36240-V, PKA $\alpha$  cat shRNA (m) Lentiviral Particles: sc-36241-V and PKA $\alpha$  cat shRNA (r) Lentiviral Particles: sc-156094-V.

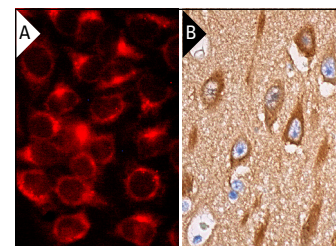
Molecular Weight of PKA $\alpha$  cat: 40 kDa.

Positive Controls: KNRK whole cell lysate: sc-2214, NIH/3T3 whole cell lysate: sc-2210 or MCF7 whole cell lysate: sc-2206.

## DATA



PKA  $\gamma$  cat (C-7): sc-48412. Western blot analysis of PKA  $\gamma$  cat expression in A549 (A), PC-3 (B), MCF7 (C), F9 (D), NIH/3T3 (E) and KNRK (F) whole cell lysates and rat testis tissue extract (G).



PKA $\alpha$  cat (C-7): sc-48412. Immunofluorescence staining of methanol-fixed HeLa cells showing cytoplasmic localization (A). Immunoperoxidase staining of formalin fixed, paraffin-embedded human cerebral cortex tissue showing cytoplasmic staining of neuronal cells and neuropil staining (B).

## SELECT PRODUCT CITATIONS

1. Flores, O., et al. 2011. Hidden prenatal malnutrition in the rat: role of  $\beta_1$ -adrenoceptors on synaptic plasticity in the frontal cortex. *J. Neurochem.* 119: 314-323.
2. Hao, N., et al. 2020. Phosphodiesterase 3A represents a therapeutic target that drives stem cell-like property and metastasis in breast cancer. *Mol. Cancer Ther.* 19: 868-881.



See **PKA $\alpha$  cat (A-2): sc-28315** for PKA $\alpha$  cat antibody conjugates, including AC, HRP, FITC, PE, and Alexa Fluor<sup>®</sup> 488, 546, 594, 647, 680 and 790.