SANTA CRUZ BIOTECHNOLOGY, INC.

p-PKA IIα reg (C-5): sc-377575

SANTA CRUZ BIOTECHNOLOGY

The Power to Question

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 (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 Cα, Cβ and Cγ, that each represent specific gene products. Cα and Cβ are closely related (93% amino acid sequence similarity), whereas Cγ displays 83% and 79% similarity to Cα and Cβ, 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. and Beavo, J.A. 1979. Phosphorylation and dephosphorylation of enzymes. Annu. Rev. Biochem. 48: 923-959.
3. Maldonado, F. and Hanks, S.K. 1988. CAMP-dependent protein kinase, α-catalytic subunit. Nucleic Acids Res. 16: 8189-8190.
4. Gonzalez, G.A. and Montminy, M.R. 1989. Cyclic AMP stimulates somatostatin gene transcription by phosphorylation of CREB at serine 133. Cell 59: 675-680.
5. Beebe, S.J., et al. 1990. Molecular cloning of a tissue-specific protein kinase (C γ) from human testis—representing a third isoform for the catalytic subunit of cAMP-dependent protein kinase. Mol. Endocrinol. 4: 465-475.
6. Meinkoth, J.L., et al. 1993. Signal transduction through the cAMP-dependent protein kinase. Mol. Cell. Biochem. 127-128: 179-186.
7. Nordheim, A. 1994. CREB takes CBP to tango. Nature 370: 177-178.

CHROMOSOMAL LOCATION

Genetic locus: PRKAR2A (human) mapping to 3p21.31; Prkar2a (mouse) mapping to 9 F2.

SOURCE

p-PKA IIα reg (C-5) is a mouse monoclonal antibody raised against a short amino acid sequence containing Ser 96 phosphorylated PKAα of mouse origin.

PRODUCT

Each vial contains 200 µg IgM 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-377575 P, (100 µg peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% stabilizer protein).

APPLICATIONS

p-PKA IIα reg (C-5) is recommended for detection of Ser 96 phosphorylated PKAα of mouse, rat and human origin by Western Blotting (starting dilution 1:100, dilution range 1:100-1:1000), immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

p-PKA IIα reg (C-5) is also recommended for detection of correspondingly phosphorylated PKAα in additional species, including canine, bovine, porcine and avian.

Molecular Weight of p-PKA IIα reg: 40 kDa.

RECOMMENDED SUPPORT REAGENTS

To ensure optimal results, the following support reagents are recommended: 1) Western Blotting: use m-IgGκ BP-HRP: sc-516102 or m-IgGκ BP-HRP (Cruz Marker): sc-516102-CM (dilution range: 1:1000-1:10000), Cruz Marker™ Molecular Weight Standards: sc-2035, TBS Blotto B Blocking Reagent: sc-2335 (use 50 mM NaF, sc-24988, as diluent), Lambda Phosphatase: sc-200312A and Western Blotting Luminol Reagent: sc-2048. 2) Immunoprecipitation: use Protein L-Agarose: sc-2336 (0.5 ml agarose/2.0 ml). 3) Immunofluorescence: use m-IgGκ BP-FITC: sc-516140 or m-IgGκ BP-PE: sc-516141 (dilution range: 1:50-1:200) with UltraCruz® Mounting Medium: sc-24941 or UltraCruz® Hard-set Mounting Medium: sc-359850.

SELECT PRODUCT CITATIONS

1. Xu, X., et al. 2018. Liraglutide regulates the viability of pancreatic α-cells and pancreatic β-cells through cAMP-PKA signal pathway. Life Sci. 195: 87-94.
2. Zhang, R., et al. 2018. Radix *Scutellariae* attenuates CUMS-induced depressive-like behavior by promoting neurogenesis via cAMP/PKA pathway. Neurochem. Res. 43: 2111-2120.
3. Cohen, S.M., et al. 2018. Calmodulin shuttling mediates cytonuclear signaling to trigger experience-dependent transcription and memory. Nat. Commun. 9: 2451.
4. Chen, S., et al. 2020. PKA-dependent membrane surface recruitment of CI-AMPARs is crucial for BCP-mediated protection against post-acute ischemic stroke cognitive impairment. Front. Neurol. 11: 566067.
5. Labes, R., et al. 2022. Daprodustat prevents cyclosporine-A mediated anemia and peritubular capillary loss. Kidney Int. 102: 750-765.
6. Zhang, S., et al. 2023. Purine metabolites promote ectopic new bone formation in ankylosing spondylitis. Int. Immunopharmacol. 116: 109810.

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.