SANTA CRUZ BIOTECHNOLOGY, INC.

CaMKIIβ (D-6): sc-376828

SANTA CRUZ BIOTECHNOLOGY

The Power to Question

BACKGROUND

The Ca^{2+}/calmodulin-dependent protein kinases (CaM kinases) comprise a structurally related subfamily of serine/threonine kinases which include CaMKI, CaMKII and CaMKIV. CaMKII is a ubiquitously expressed serine/threonine protein kinase that is activated by Ca^{2+} and calmodulin (CaM) and has been implicated in regulation of the cell cycle and transcription. There are four CaMKII isozymes designated α, β, γ and δ, which may or may not be co-expressed in the same tissue type. CaMKIV is stimulated by Ca^{2+} and CaM but phosphorylation by a CaMK is also required for full activation. Stimulation of the T cell receptor CD3 signaling complex with an anti-CD3 monoclonal antibody leads to a 10-40 fold increase in CaMKIV activity. An additional kinase, CaMKK, functions to activate CaMKI through the specific phosphorylation of the regulatory threonine residue at position 177.

CHROMOSOMAL LOCATION

Genetic locus: CAMK2B (human) mapping to 7p13, CAMK2D (human) mapping to 4q26; Camk2b (mouse) mapping to 11 A1, Camk2d (mouse) mapping to 3 G1.

SOURCE

CaMKIIβ (D-6) is a mouse monoclonal antibody specific for an epitope mapping between amino acids 511-540 at the C-terminus of CaMKIIβ of mouse origin.

PRODUCT

Each vial contains 200 µg IgG_1 kappa light chain in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

CaMKIIβ (D-6) is available conjugated to agarose (sc-376828 AC), 500 µg/ 0.25 ml agarose in 1 ml, for IP; to HRP (sc-376828 HRP), 200 µg/ml, for WB, IHC(P) and ELISA; to either phycoerythrin (sc-376828 PE), fluorescein (sc-376828 FITC), Alexa Fluor® 488 (sc-376828 AF488), Alexa Fluor® 546 (sc-376828 AF546), Alexa Fluor® 594 (sc-376828 AF594) or Alexa Fluor® 647 (sc-376828 AF647), 200 µg/ml, for WB (RGB), IF, IHC(P) and FCM; and to either Alexa Fluor® 680 (sc-376828 AF680) or Alexa Fluor® 790 (sc-376828 AF790), 200 µg/ml, for Near-Infrared (NIR) WB, IF and FCM.

Blocking peptide available for competition studies, sc-376828 P, (100 µg peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% stabilizer protein).

APPLICATIONS

CaMKIIβ (D-6) is recommended for detection of CaMKIIβ and CaMKIIδ 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), 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).

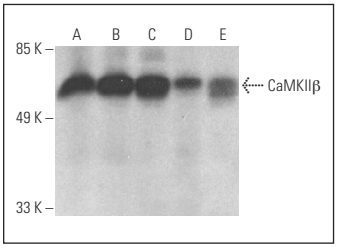
CaMKIIβ (D-6) is also recommended for detection of CaMKIIβ and CaMKIIδ in additional species, including canine and bovine.

Molecular Weight of CaMKIIβ: 58-64 kDa.

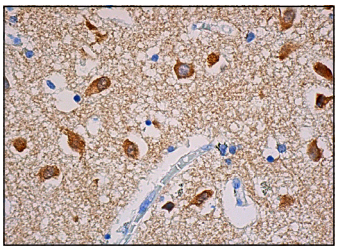
STORAGE

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

DATA



CaMKIIβ (D-6) HRP: sc-376828 HRP. Direct western blot analysis of CaMKIIβ expression in rat brain (**A**), mouse brain (**B**), mouse cerebellum (**C**), human cerebellum (**D**) and rat hippocampus (**E**) tissue extracts.



CaMKIIβ (D-6): sc-376828. Immunoperoxidase staining of formalin fixed, paraffin-embedded human lateral ventricle tissue showing cytoplasmic staining of neuronal cells.

SELECT PRODUCT CITATIONS

1. Yao, J., et al. 2020. Metformin prevents follicular atresia in aging laying chickens through activation of PI3K/Akt and calcium signaling pathways. Oxid. Med. Cell. Longev. 2020: 3648040.
2. Gu, H., et al. 2021. Targeted overexpression of PPARγ in skeletal muscle by random insertion and CRISPR/Cas9 transgenic pig cloning enhances oxidative fiber formation and intramuscular fat deposition. FASEB J. 35: e21308.
3. Zhang, K., et al. 2021. Electroacupuncture ameliorates depression-like behaviour in rats by enhancing synaptic plasticity via the GluN2B/CaMKII/CREB signalling pathway. Evid. Based Complement. Alternat. Med. 2021: 2146001.
4. Fan, Y., et al. 2021. Activation of orexin system stimulates CaMKII expression. Front. Physiol. 12: 698185.
5. Yan, Q., et al. 2022. Loss of phosphatidylinositol-4-phosphate 5-kinase type-1 γ (Pip5k1c) in mesenchymal stem cells leads to osteopenia by impairing bone remodeling. J. Biol. Chem. 298: 101639.
6. Del Bondio, A., et al. 2023. Restoring calcium homeostasis in Purkinje cells arrests neurodegeneration and neuroinflammation in the ARSACS mouse model. JCI Insight 8: e163576.
7. Martinez-Canton, M., et al. 2024. CaMKII protein expression and phosphorylation in human skeletal muscle by immunoblotting: Isoform specificity. Free Radic. Biol. Med. 224: 182-189.

RESEARCH USE

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

PROTOCOLS

See our web site at www.scbt.com for detailed protocols and support products.