

CaMKII β (D-6): sc-376828

BACKGROUND

The Ca²⁺/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 Ca²⁺ 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 Ca²⁺ 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.

REFERENCES

1. Tombes, R.M., et al. 1995. G₁ cell cycle arrest apoptosis are induced in NIH 3T3 cells by KN-93, an inhibitor of CaMK-II (the multifunctional Ca²⁺/CaM kinase). *Cell Growth Differ.* 6: 1063-1070.
2. Hama, N., et al. 1995. Calcium/calmodulin-dependent protein kinase II downregulates both calcineurin and protein kinase c-mediated pathways for cytokine gene transcription in human T cells. *J. Exp. Med.* 181: 1217-1222.

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

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

PRODUCT

Each vial contains 200 μ g IgG₁ kappa light chain in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

CaMKII β (D-6) is available conjugated to agarose (sc-376828 AC), 500 μ g/0.25 ml agarose in 1 ml, for IP; to HRP (sc-376828 HRP), 200 μ g/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 μ g/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 μ g/ml, for Near-Infrared (NIR) WB, IF and FCM.

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

Alexa Fluor[®] is a trademark of Molecular Probes, Inc., Oregon, USA

RESEARCH USE

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

APPLICATIONS

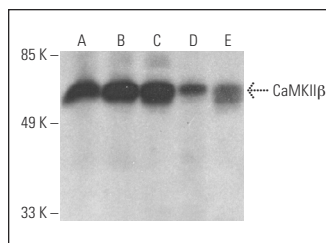
CaMKII β (D-6) is recommended for detection of CaMKII β and CaMKII δ of mouse, rat and human origin by Western Blotting (starting dilution 1:100, dilution range 1:100-1:1000), immunoprecipitation [1-2 μ g per 100-500 μ g of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, 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).

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

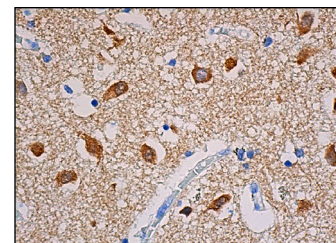
Molecular Weight of CaMKII β : 58-64 kDa.

Positive Controls: mouse brain extract: sc-2253, mouse cerebellum extract: sc-2403 or rat brain extract: sc-2392.

DATA



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



CaMKII β (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 PPAR γ 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. Fan, Y., et al. 2021. Activation of orexin system stimulates CaMKII expression. *Front. Physiol.* 12: 698185.
4. 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.
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.

STORAGE

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