SANTA CRUZ BIOTECHNOLOGY, INC.

CaMKII (H-300): sc-13082

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 an 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 also requires phosphorylation by a CaMK 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. G_1 cell cycle arrest apoptosis are induced in NIH/3T3 cells by KN-93, an inhibitor of CaMKII (the multifunctional Ca^{2+}/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.

SOURCE

CaMKII (H-300) is a rabbit polyclonal antibody raised against amino acids 1-300 mapping at the N-terminus of CaMKIIα of human origin.

PRODUCT

Each vial contains 200 µg IgG in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

APPLICATIONS

CaMKII (H-300) is recommended for detection of CaMKIIα, CaMKIIβ, CaMKIIγ and CaMKIIδ subunits of mouse, rat and human origin by Western Blotting (starting dilution 1:200, 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 immunohistochemistry (including paraffin-embedded sections) (starting dilution 1:50, dilution range 1:50-1:500).

CaMKII (H-300) is also recommended for detection of CaMKIIα, CaMKIIβ, CaMKIIγ and CaMKIIδ subunits in additional species, including equine, canine, bovine, porcine and avian.

Molecular Weight of CAMKII: 50 kDa.

Positive Controls: CaMKIIδ (h): 293T Lysate: sc-115074, rat brain extract: sc-2392 or mouse brain extract: sc-2253.

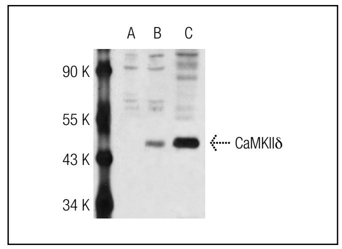
STORAGE

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

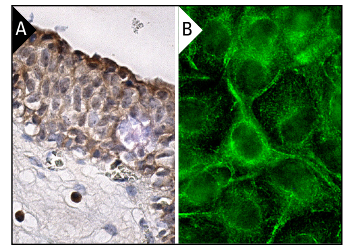
RESEARCH USE

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

DATA



CaMKII (H-300): sc-13082. Western blot analysis of CaMKIIδ expression in non-transfected: sc-117752 (**A**) and human CaMKIIδ transfected: sc-115074 (**B**) 293T whole cell lysates and mouse brain tissue extract (**C**).



CaMKII (H-300): sc-13082. Immunoperoxidase staining of formalin fixed, paraffin-embedded human urinary bladder tissue showing cytoplasmic staining of urothelial cells (**A**). Immunofluorescence staining of methanol-fixed HeLa cells showing membrane and cytoplasmic localization (**B**).

SELECT PRODUCT CITATIONS

1. Miller, S., et al. 2002. Disruption of dendritic translation of CaMKIIα impairs stabilization of synaptic plasticity and memory consolidation. Neuron 36: 507-519.

2. Setiawan, E., et al. 2007. Effects of repeated prenatal glucocorticoid exposure on long-term potentiation in the juvenile guinea-pig hippocampus. J. Physiol. 581: 1033-1042.

3. Gallego, M., et al. 2008. Reduced calmodulin expression accelerates transient outward potassium current inactivation in diabetic rat heart. Cell. Physiol. Biochem. 22: 625-634.

4. Wang, Y., et al. 2008. Ca^{2+}/calmodulin-dependent protein kinase II-dependent remodeling of Ca^{2+} current in pressure overload heart failure. J. Biol. Chem. 283: 25524-25532.

5. Musumeci, G., et al. 2009. TrkB modulates fear learning and amygdalar synaptic plasticity by specific docking sites. J. Neurosci. 29: 10131-10143.

6. Little, G.H., et al. 2009. Critical role of nuclear calcium/calmodulin-dependent protein kinase IIδB in cardiomyocyte survival in cardiomyopathy. J. Biol. Chem. 284: 24857-24868.

7. Egan, B., et al. 2010. Exercise intensity-dependent regulation of peroxisome proliferator-activated receptor coactivator-1 mRNA abundance is associated with differential activation of upstream signalling kinases in human skeletal muscle. J. Physiol. 588: 1779-1790.

8. Tatara, Y., et al. 2010. Identification of Pin1-binding phosphorylated proteins in the mouse brain. Biosci. Biotechnol. Biochem. 74: 2480-2483.

9. Santillo, A., et al. 2011. Molecular pathways involved in the cyclic activity of frog *(Pelophylax esculentus)* Harderian gland: influence of temperature and testosterone. Comp. Biochem. Physiol. B, Biochem. Mol. Biol. 158: 71-76.

10. Hammerschmidt, T., et al. 2013. Selective loss of noradrenaline exacerbates early cognitive dysfunction and synaptic deficits in APP/PS1 mice. Biol. Psychiatry 73: 454-463.