SANTA CRUZ BIOTECHNOLOGY, INC.

CaMKIV (26): sc-136249

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 coexpressed 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.
3. Baltas, L.G., et al. 1995. The cardiac sarcoplasmic reticulum phospholamban kinase is a distinct δ-CaM kinase isozyme. FEBS Lett. 373: 71-75.
4. Tokumitsu, H., et al. 1995. Characterization of a CaM-kinase cascade: molecular cloning and expression of calcium/calmodulin-dependent protein kinase kinase. J. Biol. Chem. 270: 19320-19324.
5. Park, I.K., et al. 1995. Activation of Ca^{2+}/calmodulin-dependent protein kinase (CaM-kinase) IV by CaM-kinase kinase in Jurkat T lymphocytes. J. Biol. Chem. 270: 30464-30469.
6. Tashima, K., et al. 1996. Overexpression of Ca^{2+}/calmodulin-dependent protein kinase II inhibits neurite outgrowth of PC-12 cells. J. Neurochem. 66: 57-64.

CHROMOSOMAL LOCATION

Genetic locus: CAMK4 (human) mapping to 5q22.1; Camk4 (mouse) mapping to 18 B1.

SOURCE

CaMKIV (26) is a mouse monoclonal antibody raised against amino acids 1-241 of CaMKIV of human origin.

PRODUCT

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

STORAGE

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

APPLICATIONS

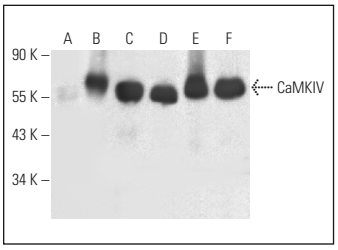
CaMKIV (26) is recommended for detection of CaMKIV of mouse, rat and human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000), immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)] and immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500).

Suitable for use as control antibody for CaMKIV siRNA (h): sc-29902, CaMKIV siRNA (m): sc-29903, CaMKIV siRNA (r): sc-72193, CaMKIV shRNA Plasmid (h): sc-29902-SH, CaMKIV shRNA Plasmid (m): sc-29903-SH, CaMKIV shRNA Plasmid (r): sc-72193-SH, CaMKIV shRNA (h) Lentiviral Particles: sc-29902-V, CaMKIV shRNA (m) Lentiviral Particles: sc-29903-V and CaMKIV shRNA (r) Lentiviral Particles: sc-72193-V.

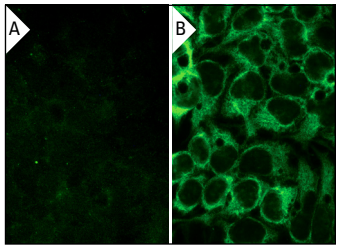
Molecular Weight of CaMKIV: 60 kDa.

Positive Controls: CaMKIV (h9): 293 Lysate: sc-158335, Jurkat whole cell lysate: sc-2204 or Ramos cell lysate: sc-2216.

DATA



CaMKIV (26): sc-136249. Western blot analysis of CaMKIV expression in non-transfected 293: sc-110760 (**A**), human CaMKIV transfected 293: sc-158335 (**B**), Jurkat (**C**) and Ramos (**D**) whole cell lysates and mouse brain (**E**) and rat brain (**F**) tissue extracts.



CaMKIV (26): sc-136249. Immunofluorescence staining of methanol-fixed untransfected (**A**) and human CaMKIV transfected HEK 293T cells (**B**).

SELECT PRODUCT CITATIONS

1. Cohen, S.M., et al. 2015. Evolutionary and functional perspectives on signaling from neuronal surface to nucleus. Biochem. Biophys. Res. Commun. 460: 88-99.
2. Yin, Y., et al. 2016. Tau accumulation induces synaptic impairment and memory deficit by calcineurin-mediated inactivation of nuclear CaMKIV/CREB signaling. Proc. Natl. Acad. Sci. USA 113: E3773-E3781.
3. Liu, E., et al. 2019. Enriched gestation activates the IGF pathway to evoke embryo-adult benefits to prevent Alzheimer's disease. Transl. Neurodegener. 8: 8.

RESEARCH USE

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

PROTOCOLS

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