SANTA CRUZ BIOTECHNOLOGY, INC.

CaMKIV (H-5): sc-55501

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 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.

CHROMOSOMAL LOCATION

Genetic locus: CAMK4 (human) mapping to 5q22.1.

SOURCE

CaMKIV (H-5) is a mouse monoclonal antibody raised against amino acids 328-473 mapping at the C-terminus of CaMKIV of human 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.

CaMKIV (H-5) is available conjugated to agarose (sc-55501 AC), 500 µg/ 0.25 ml agarose in 1 ml, for IP; to HRP (sc-55501 HRP), 200 µg/ml, for WB, IHC(P) and ELISA; to either phycoerythrin (sc-55501 PE), fluorescein (sc-55501 FITC), Alexa Fluor® 488 (sc-55501 AF488), Alexa Fluor® 546 (sc-55501 AF546), Alexa Fluor® 594 (sc-55501 AF594) or Alexa Fluor® 647 (sc-55501 AF647), 200 µg/ml, for WB (RGB), IF, IHC(P) and FCM; and to either Alexa Fluor® 680 (sc-55501 AF680) or Alexa Fluor® 790 (sc-55501 AF790), 200 µg/ml, for Near-Infrared (NIR) WB, IF and FCM.

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APPLICATIONS

CaMKIV (H-5) is recommended for detection of CaMKIV of 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).

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

Molecular Weight of CaMKIV: 60 kDa.

Positive Controls: Jurkat whole cell lysate: sc-2204, A-431 whole cell lysate: sc-2201 or CaMKIV (h): 293T Lysate: sc-114186.

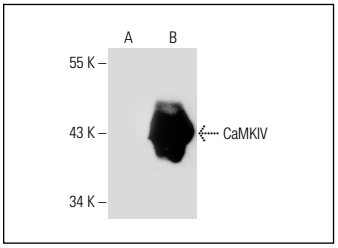
RESEARCH USE

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

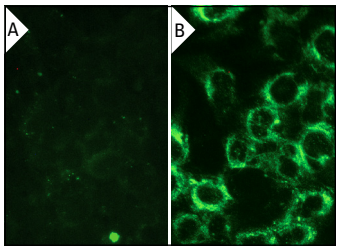
STORAGE

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

DATA



CaMKIV (H-5): sc-55501. Western blot analysis of CaMKIV expression in non-transfected: sc-117752 (**A**) and human CaMKIV transfected: sc-114186 (**B**) 293T whole cell lysates.



CaMKIV (H-5): sc-55501. Immunofluorescence staining of methanol-fixed untransfected (**A**) and human CaMKIV transfected HEK 293T cells (**B**).

SELECT PRODUCT CITATIONS

1. Watanabe, S., et al. 2014. Cardiac-specific inhibition of kinase activity in calcium/calmodulin-dependent protein kinase kinase-β leads to accelerated left ventricular remodeling and heart failure after transverse aortic constriction in mice. PLoS ONE 9: e108201.
2. Xu, Q., et al. 2015. σ1 receptor activation regulates brain-derived neurotrophic factor through NR2A-CaMKIV-TORC1 pathway to rescue the impairment of learning and memory induced by brain ischaemia/reperfusion. Psychopharmacology 232: 1779-1791.
3. Takei, Y., et al. 2016. Osteoclastogenic differentiation of macrophages in the development of abdominal aortic aneurysms. Arterioscler. Thromb. Vasc. Biol. 36: 1962-1971.
4. Xu, Q., et al. 2017. σ-1 receptor in brain ischemia/reperfusion: possible role in the NR2A-induced pathway to regulate brain-derived neurotrophic factor. J. Neurol. Sci. 376: 166-175.
5. Grössinger, E.M., et al. 2018. Ca^{2+}-dependent regulation of NFATc1 via KCa3.1 in inflammatory osteoclastogenesis. J. Immunol. 200: 749-757.
6. Hao, Z., et al. 2019. Motor dysfunction and neurodegeneration in a C9orf72 mouse line expressing poly-PR. Nat. Commun. 10: 2906.
7. Moreno, C., et al. 2020. $Ca_V1.2$ activity and downstream signaling pathways in the hippocampus of an animal model of depression. Cells 9: E2609.
8. Yong, L., et al. 2022. Calcium/calmodulin-dependent protein kinase IV promotes imiquimod-induced psoriatic inflammation via macrophages and keratinocytes in mice. Nat. Commun. 13: 4255.
9. Liu, J. and He, Q. 2023. Ca^{2+}/calmodulin-dependent protein kinase IV attenuates inflammation and mitochondrial dysfunction under insulin resistance in C2C12 cells. Arch. Physiol. Biochem. 129: 690-699.

PROTOCOLS

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