

# CaMKII $\alpha$ (45): sc-136212

## BACKGROUND

The Ca<sup>2+</sup>/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<sup>2+</sup> and calmodulin (CaM) and has been implicated in regulation of the cell cycle and transcription. There are four CaMKII isozymes, designated  $\alpha$ ,  $\beta$ ,  $\gamma$  and  $\delta$ , which may or may not be co-expressed in the same tissue type. CaMKIV is stimulated by Ca<sup>2+</sup> 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<sub>1</sub> cell cycle arrest apoptosis are induced in NIH/3T3 cells by KN-93, an inhibitor of CaMKII (the multifunctional Ca<sup>2+</sup>/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. 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.
4. Park, I.K., et al. 1995. Activation of Ca<sup>2+</sup>/calmodulin-dependent protein kinase (CaM-kinase) IV by CaM-kinase kinase in Jurkat T lymphocytes. *J. Biol. Chem.* 270: 30464-30469.
5. Baltas, L.G., et al. 1995. The cardiac sarcoplasmic reticulum phospholamban kinase is a distinct  $\delta$ -CaM kinase isozyme. *FEBS Lett.* 373: 71-75.

## CHROMOSOMAL LOCATION

Genetic locus: CAMK2A (human) mapping to 5q32; Camk2a (mouse) mapping to 18 E1.

## SOURCE

CaMKII $\alpha$  (45) is a mouse monoclonal antibody raised against amino acids 448-460 of CaMKII $\alpha$  of rat origin.

## PRODUCT

Each vial contains 50  $\mu$ g IgG<sub>1</sub> in 0.5 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.

## RESEARCH USE

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

## APPLICATIONS

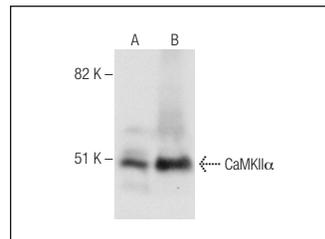
CaMKII $\alpha$  (45) is recommended for detection of CaMKII $\alpha$  of mouse, rat, human and canine origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000), immunoprecipitation [1-2  $\mu$ g per 100-500  $\mu$ g of total protein (1 ml of cell lysate)] and immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500).

Suitable for use as control antibody for CaMKII $\alpha$  siRNA (h): sc-29900, CaMKII $\alpha$  siRNA (m): sc-29901, CaMKII $\alpha$  siRNA (r): sc-156070, CaMKII $\alpha$  shRNA Plasmid (h): sc-29900-SH, CaMKII $\alpha$  shRNA Plasmid (m): sc-29901-SH, CaMKII $\alpha$  shRNA Plasmid (r): sc-156070-SH, CaMKII $\alpha$  shRNA (h) Lentiviral Particles: sc-29900-V, CaMKII $\alpha$  shRNA (m) Lentiviral Particles: sc-29901-V and CaMKII $\alpha$  shRNA (r) Lentiviral Particles: sc-156070-V.

Molecular Weight of CaMKII $\alpha$ : 50 kDa.

Positive Controls: mouse brain extract: sc-2253, U-87 MG cell lysate: sc-2411 or IMR-32 cell lysate: sc-2409.

## DATA



CaMKII $\alpha$  (45): sc-136212. Western blot analysis of CaMKII $\alpha$  expression in IMR-32 (A) and U-87 MG (B) whole cell lysates.

## SELECT PRODUCT CITATIONS

1. Vallortigara, J., et al. 2014. Dynamin1 concentration in the prefrontal cortex is associated with cognitive impairment in Lewy body dementia. *F1000Res.* 3: 108.

## PROTOCOLS

See our web site at [www.scbt.com](http://www.scbt.com) for detailed protocols and support products.



See **CaMKII (G-1): sc-5306** for CaMKII antibody conjugates, including AC, HRP, FITC, PE, and Alexa Fluor® 488, 546, 594, 647, 680 and 790.